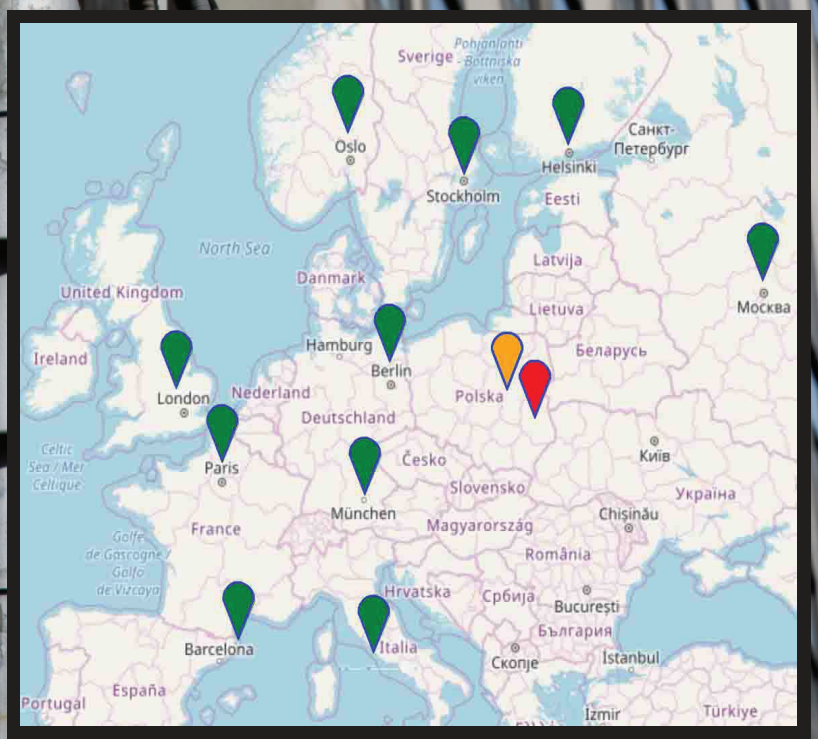
NTS Network Time Software
Audit & Monitoring for MiFID II

- Alarms all events in view
- Scalable intuitive GUI
- WEB-based technology
- Multi-tier architecture
- Geographical topology
- Maps OpenStreetMap,Google*
- PDF raport auto generation
- Operates standalone SERVER
- Works in Virtual Machine env.
- Multiple views
- HA High Availability option
- User panel customization
- Data Base storing AUDITdata
- Hardware Requirement:
  - CPU 8x core
  - RAM 64 GB
  - HD 4TB (SSD RAID5)
  - OS Ubuntu x64 Srv
- Supporting NTS-5000
- Applications (Networks)
  - Smart Grids
  - Telecom 5G
  - Financial Market
  - Government
  - Enterprise
  - Radio/TV



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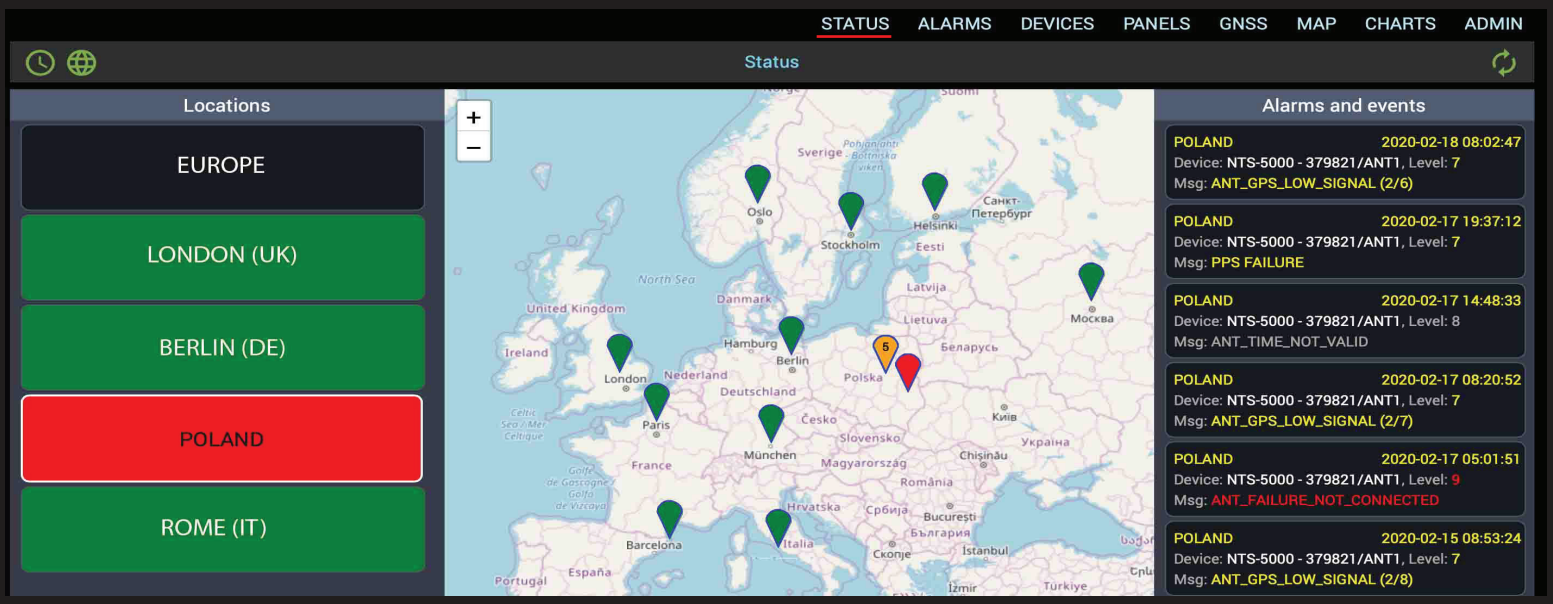
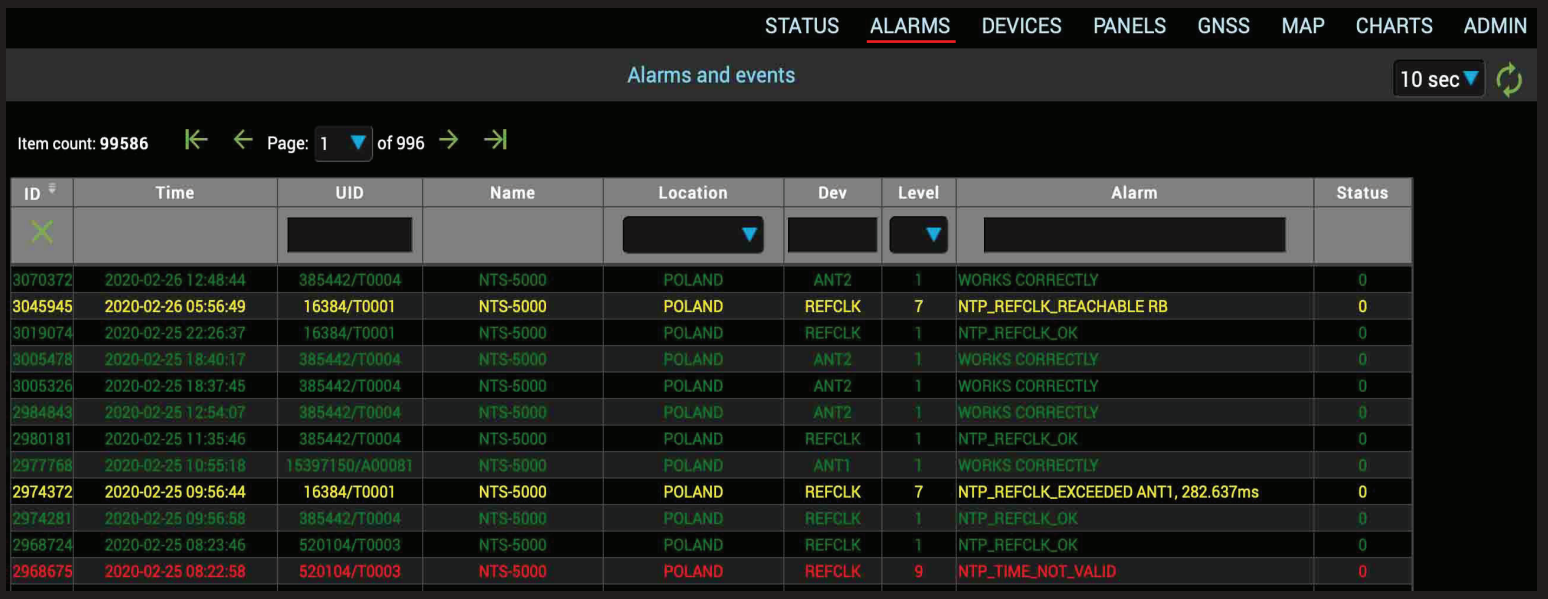
The fundamental principle of using ELPROMA time audit and monitoring software is limited to focusing on colors. There are three signal class colors: **RED** indicating ERROR, **YELLOW** - highlighting warnings, and most peaceful **GREEN** meaning everything is fine (ok) with synchronization. Main screen includes three areas: left, mid and right. The left part of the screen displays user-defined groups of servers. You can create your own customized definition of groups for quick accessing the specific server population. Below example present set of servers: EUROPE (all servers), servers located in LONDON(UK) and POLAND. Red color indicates there are problems with servers located in Poland. You can trace alarms & events general LOGs on the right side of the screen.

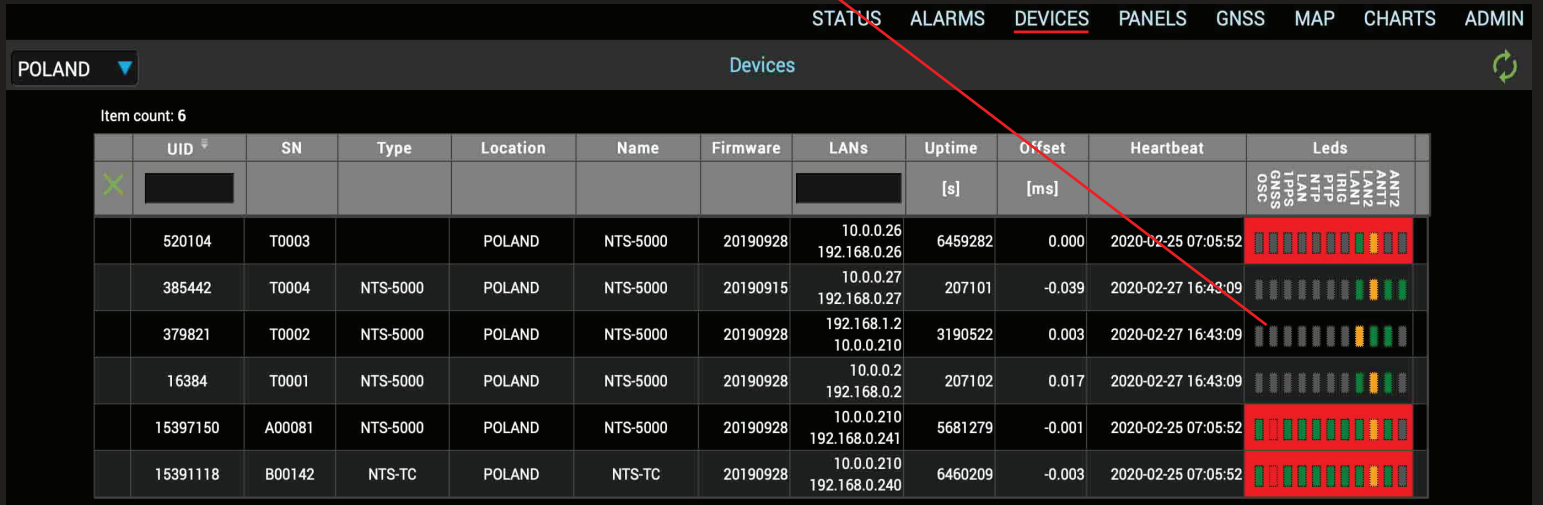


The ALARMS menu item is alternative step to STATUS view. It provides detailed event information from specific group of time servers. You can sort the information in specific order by clicking title row item. All DATA LOG information is stored inside database (DB) for current and future retrospective analyses.

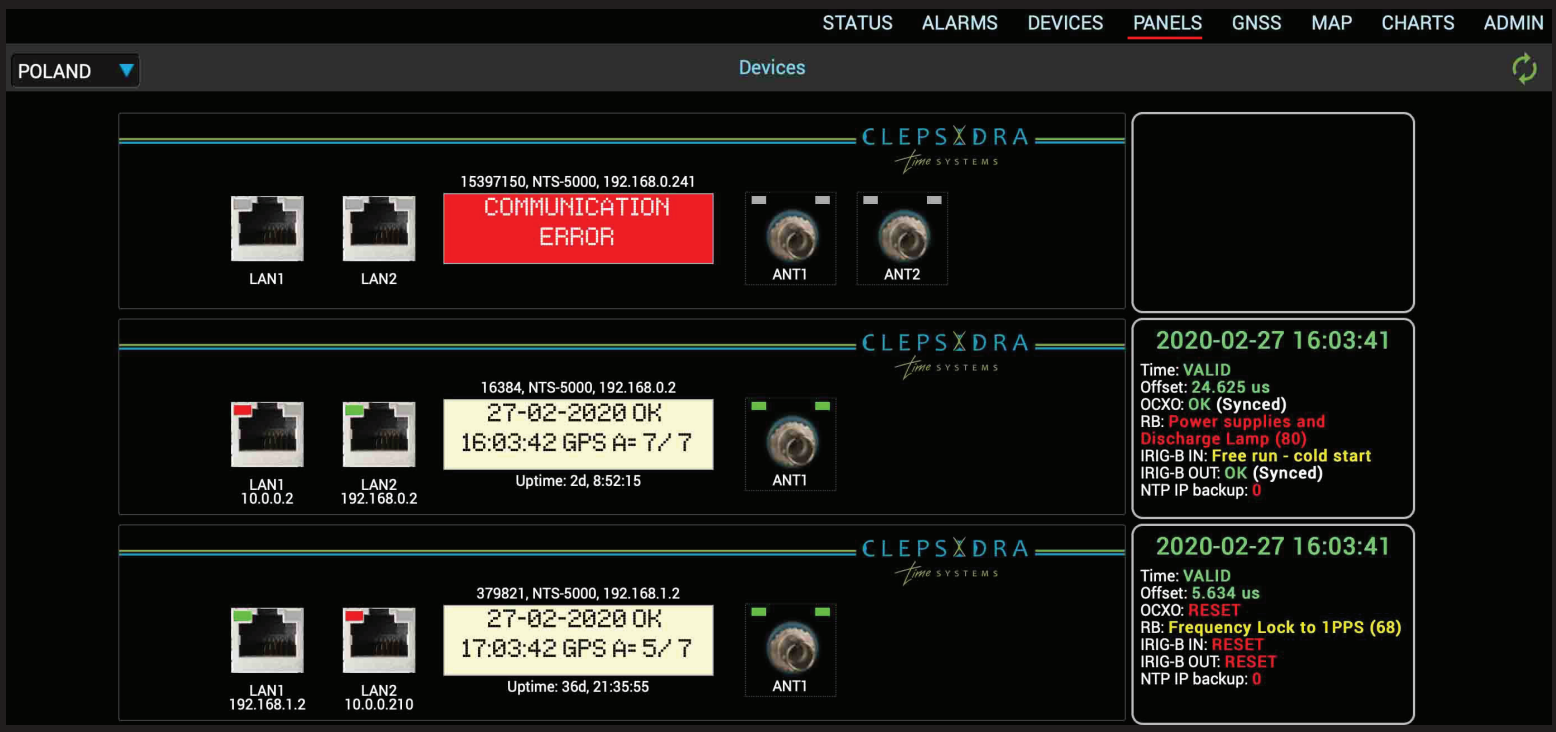


ID	Time	UID	Name	Location	Dev	Level	Alarm	Status
3070372	2020-02-26 12:48:44	385442/T0004	NTS-5000	POLAND	ANT2	1	WORKS CORRECTLY	0
3045945	2020-02-26 05:56:49	16384/T0001	NTS-5000	POLAND	REFCLK	7	NTP_REFCLK_REACHABLE RB	0
3019074	2020-02-25 22:26:37	16384/T0001	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
3005478	2020-02-25 18:40:17	385442/T0004	NTS-5000	POLAND	ANT2	1	WORKS CORRECTLY	0
3005326	2020-02-25 18:37:45	385442/T0004	NTS-5000	POLAND	ANT2	1	WORKS CORRECTLY	0
2984843	2020-02-25 12:54:07	385442/T0004	NTS-5000	POLAND	ANT2	1	WORKS CORRECTLY	0
2980181	2020-02-25 11:35:46	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
2977768	2020-02-25 10:55:18	15397150/A00081	NTS-5000	POLAND	ANT1	1	WORKS CORRECTLY	0
2974372	2020-02-25 09:56:44	16384/T0001	NTS-5000	POLAND	REFCLK	7	NTP_REFCLK_EXCEEDED ANT1, 282.637ms	0
2974281	2020-02-25 09:56:58	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
2968724	2020-02-25 08:23:46	520104/T0003	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
2968675	2020-02-25 08:22:58	520104/T0003	NTS-5000	POLAND	REFCLK	9	NTP_TIME_NOT_VALID	0

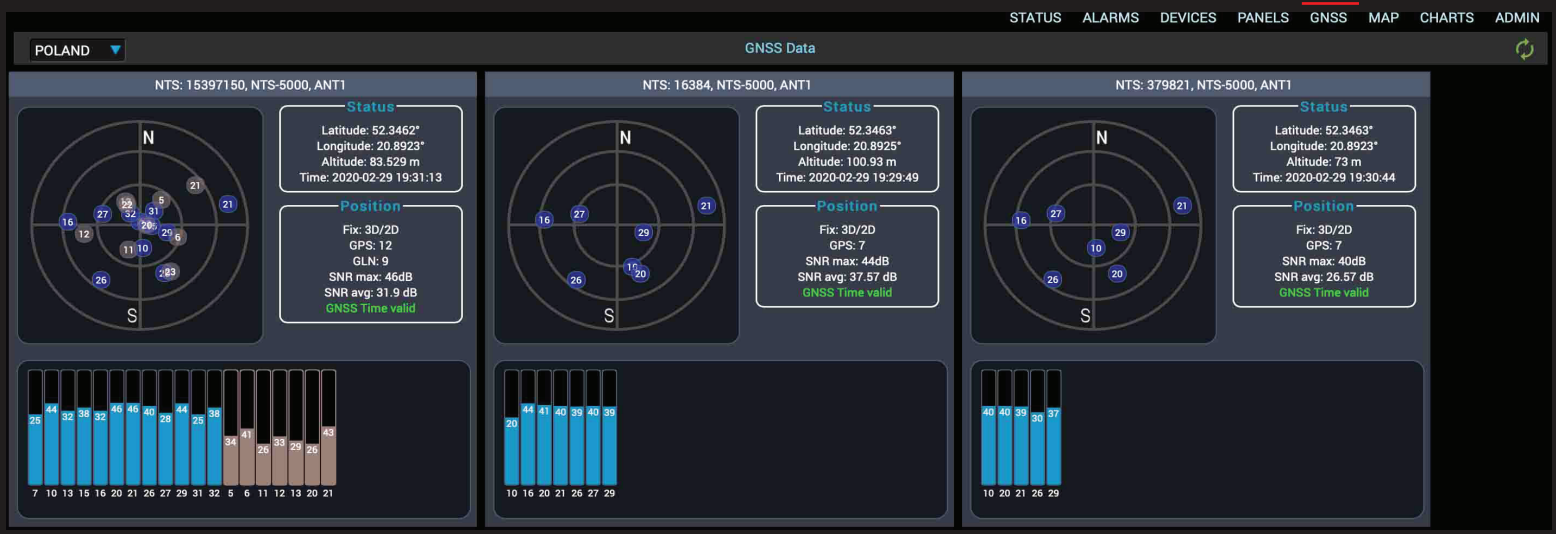
Another way of handling large population of NTS time server devices is text-mode view panel. The special syntactic sugar of this text-mode screen is the right side LED indication row. It provides a real-time device front panel LED status information. Together with other network data it provides general status quo of server group or specific quered it's subgroup.



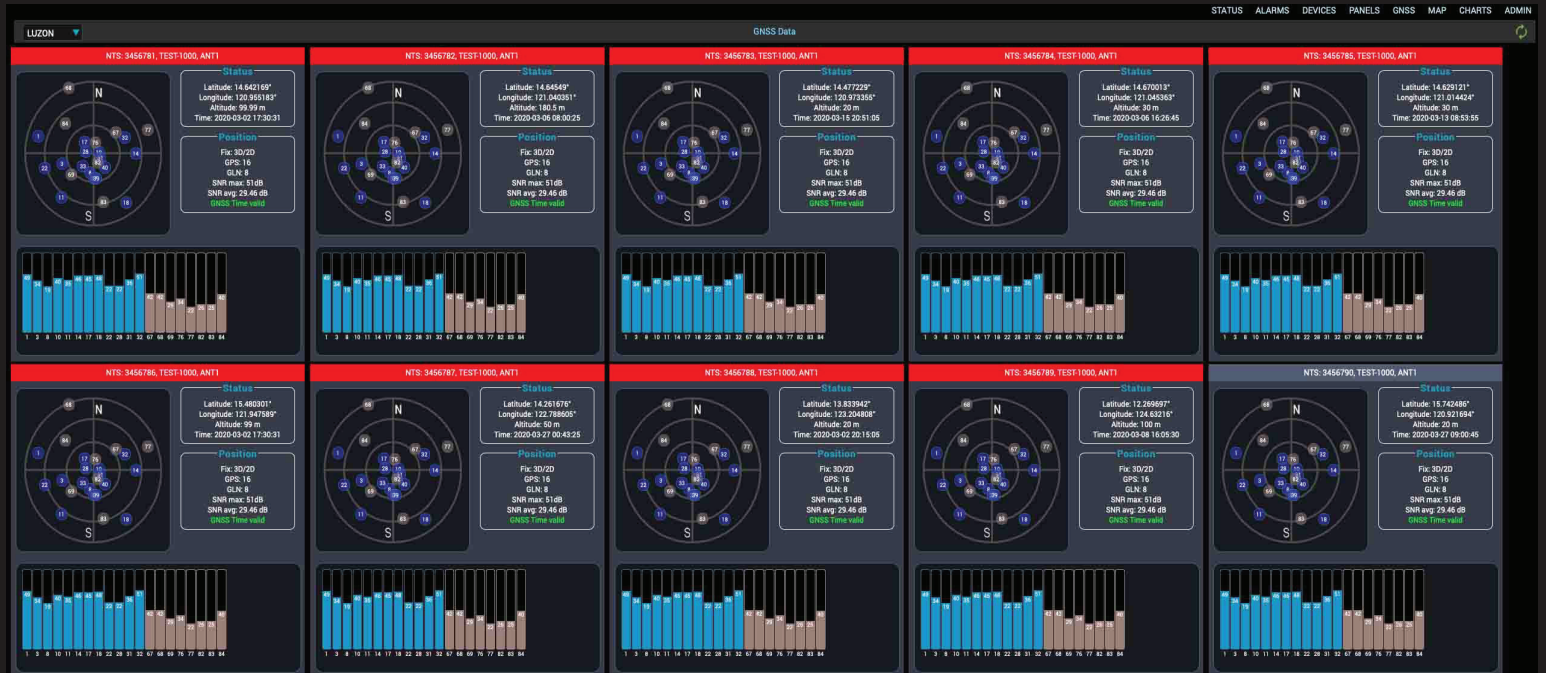
UID	SN	Type	Location	Name	Firmware	LANs	Uptime [s]	Offset [ms]	Heartbeat	Leds
520104	T0003		POLAND	NTS-5000	20190928	10.0.0.26 192.168.0.26	6459282	0.000	2020-02-25 07:05:52	
385442	T0004	NTS-5000	POLAND	NTS-5000	20190915	10.0.0.27 192.168.0.27	207101	-0.039	2020-02-27 16:43:09	
379821	T0002	NTS-5000	POLAND	NTS-5000	20190928	192.168.1.2 10.0.0.210	3190522	0.003	2020-02-27 16:43:09	
16384	T0001	NTS-5000	POLAND	NTS-5000	20190928	10.0.0.2 192.168.0.2	207102	0.017	2020-02-27 16:43:09	
15397150	A00081	NTS-5000	POLAND	NTS-5000	20190928	10.0.0.210 192.168.0.241	5681279	-0.001	2020-02-25 07:05:52	
15391118	B00142	NTS-TC	POLAND	NTS-TC	20190928	10.0.0.210 192.168.0.240	6460209	-0.003	2020-02-25 07:05:52	



The PANELS is a next MENU item. It groups inside single view window all NTS server virtual front panels. It is simplified version of real NTS front panel. Panels operate real-time (RT) providing all LED/LCD information. Additional information, the one as TIME, OFFSET, OCXO/Rb STATUS etc. are provided too.

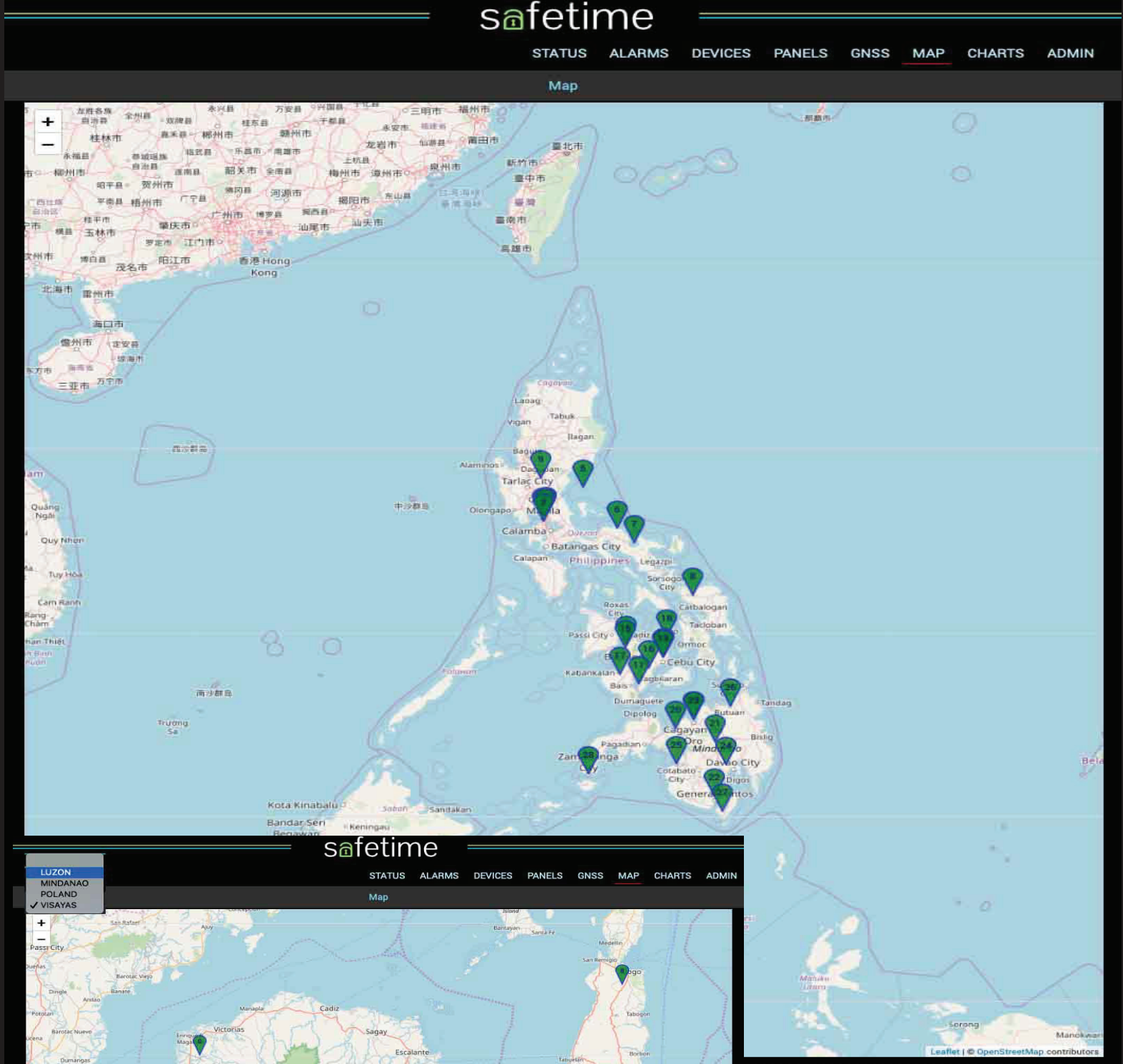


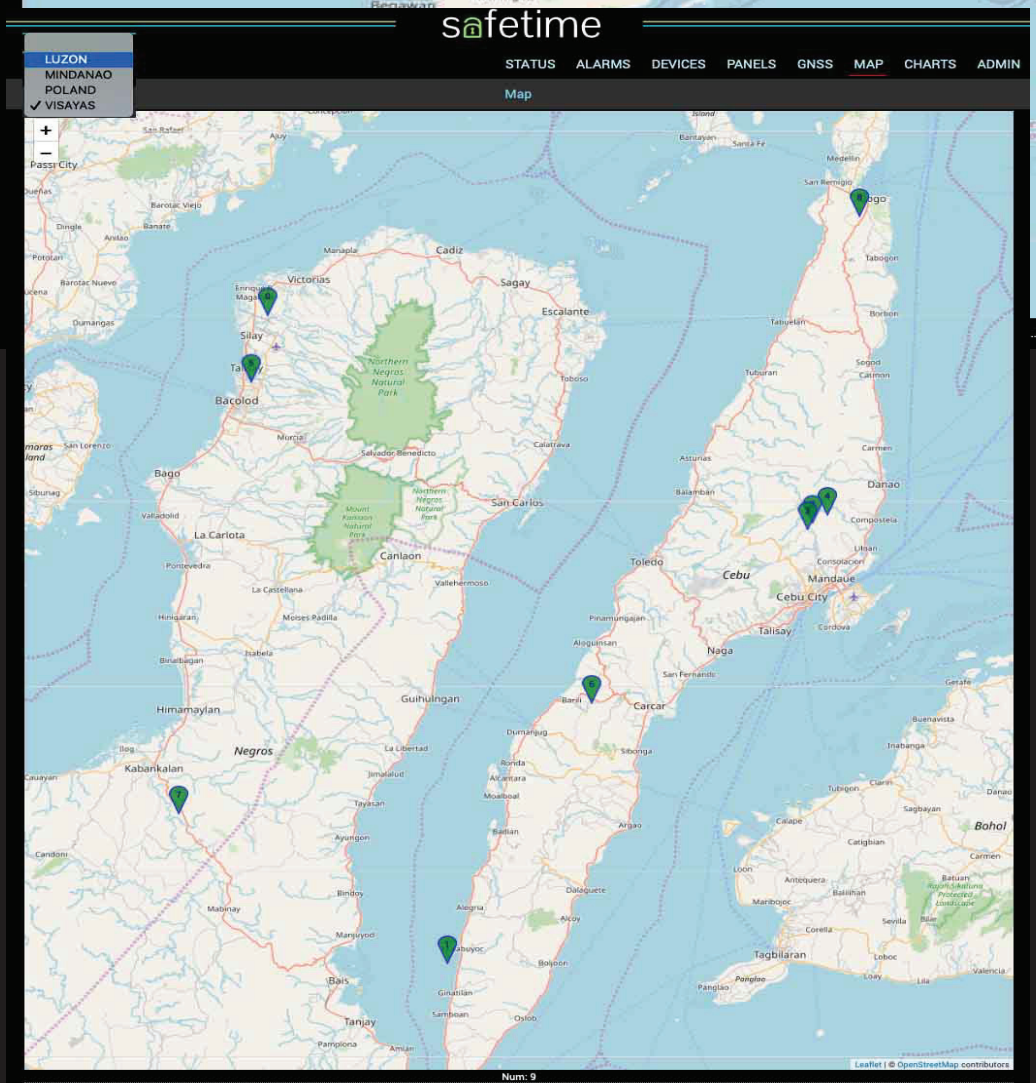
Each server's antenna is traceable individually. But you can also group receivers on one screen. The screen can display multiple GNSS radars (graphic status information), so all regions or groups can be traced from single console. Each GNSS receiver data includes: Latitude, Longitude, Altitude, UTC, Fix-position 2D/3D, number of visible satellites, their signal strength and final time validity information.



Plotting charts is one of major functionalities. Multiple servers can be observed simultaneously for all 3 parameters: OFFSET to UTC, network DELAY, synchronization JITTER. It lets administrator compare beehive of time servers located in different places but measured from one common point of reference – the central management system.

This data is stored in local DataBase (DB) subsystem and can be used for later report generation. Depends on legislation requirements data can be archived from days up to many years. It lets recover the conditions synchronization was operating at specific moment of history. Such functionality is specially useful for future problems, including blackout analyses.





The GNSS receivers can be linked to Maps. The NTS Monitoring Software use Open Street Maps and alternatively (optionally) the Google Maps.
The maps show with accuracy of meters localization of GNSS antennas (not NTS-5000 servers). This is helpful in case of deploying service procedures and system maintenance.

You can choose between different maps and screens. The map can show all country, it's region or a local street and buildings where GNSS receiver is located. Switching between groups of antennas is organized during system deployment. You can choose specific group of GNSS receivers from the upper left menu.

Menu to switch between the maps

You can group GNSS receivers displaying different receivers depends on map.

Alarms are always ADMIN basic views to follow. The ELPROMA network synchronization software provides necessary tools to view and monitor status quo of all time servers simultaneously. The build-in alarm database enables functionality to archive all data for later retrospective analyses (e.g. after blackouts).

Traffic lights-oriented structures of colours (GREEN, YELLOW, RED) immediately helps recognise errors and warnings. You can sort and search alarm events by selecting specific pattern for each data column indyvidually.

ID	Time	UID	Name	Location	Dev	Level	Alarm	Status
5635719	2020-03-27 07:04:28	385442/T0004	NTS-5000	POLAND	REFCLK	9	NTP_TIME_NOT_VALID	0
5635456	2020-03-27 07:00:03	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5635440	2020-03-27 06:59:47	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5635351	2020-03-27 06:58:19	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5635280	2020-03-27 06:57:07	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5635264	2020-03-27 06:56:52	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5635254	2020-03-27 06:56:44	385442/T0004	NTS-5000	POLAND	REFCLK	9	NTP_TIME_NOT_VALID	0
5634903	2020-03-27 06:50:51	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5634768	2020-03-27 06:48:35	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5634744	2020-03-27 06:48:11	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5634694	2020-03-27 06:47:23	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5634623	2020-03-27 06:46:11	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5631832	2020-03-27 05:59:24	385442/T0004	NTS-5000	POLAND	REFCLK	9	NTP_TIME_NOT_VALID	0
5594665	2020-03-26 19:35:07	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5548490	2020-03-26 06:39:35	385442/T0004	NTS-5000	POLAND	REFCLK	9	NTP_TIME_NOT_VALID	0
5544312	2020-03-26 05:29:31	379821/T0002	NTS-5000	POLAND	ANT1	7	ANT_GPS_LOW_SIGNAL (2/6)	0
5502558	2020-03-25 17:48:48	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5477885	2020-03-25 10:55:03	385442/T0004	NTS-5000	POLAND	ANT2	1	WORKS CORRECTLY	0
5474363	2020-03-25 09:55:49	379821/T0002	NTS-5000	POLAND	NTP PEER	1	NTP_PEER_OK	0
5465437	2020-03-25 07:25:57	385442/T0004	NTS-5000	POLAND	REFCLK	9	NTP_TIME_NOT_VALID	0
5465078	2020-03-25 07:19:56	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5465021	2020-03-25 07:19:00	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5464972	2020-03-25 07:18:12	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5464795	2020-03-25 07:15:16	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5464762	2020-03-25 07:14:44	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5464745	2020-03-25 07:14:28	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5464720	2020-03-25 07:14:04	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5464656	2020-03-25 07:13:00	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5462213	2020-03-25 06:31:57	385442/T0004	NTS-5000	POLAND	REFCLK	9	NTP_TIME_NOT_VALID	0
5450084	2020-03-25 03:07:36	16384/T0001	NTS-5000	POLAND	ANT1	3	ANT_LEAP_NOT_AVAILABLE	5450088
5433736	2020-03-24 22:32:10	16384/T0001	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5415271	2020-03-24 17:24:06	385442/T0004	NTS-5000	POLAND	REFCLK	1	NTP_REFCLK_OK	0
5407340	2020-03-24 15:10:58	15397150/A00081	NTS-5000	POLAND	REFCLK	7	NTP_REFCLK_REACHABLE RB	0
5407038	2020-03-24 15:05:58	15397150/A00081	NTS-5000	POLAND	REFCLK	7	NTP_REFCLK_REACHABLE OCXO	0
5406102	2020-03-24 14:50:14	15397150/A00081	NTS-5000	POLAND	REFCLK	9	NTP_TIME_NOT_VALID	0
5406039	2020-03-24 14:49:15	385442/T0004	NTS-5000	POLAND	ANT1	9	ANT_FAILURE_NOT_CONNECTED	0
5405842	2020-03-24 14:45:58	15397150/A00081	NTS-5000	POLAND	ANT1	9	ANT_FAILURE_NOT_CONNECTED	0
5405757	2020-03-24 14:44:35	385442/T0004	NTS-5000	POLAND	ANT1	9	ANT_FAILURE_NOT_CONNECTED	0
5401749	2020-03-24 13:36:36	16384/T0001	NTS-5000	POLAND	ANT1	3	ANT_LEAP_NOT_AVAILABLE	5401754
5399844	2020-03-24 13:05:25	15391118/B00142	NTS-TC	POLAND	ANT1	9	ANT_FAILURE_NOT_CONNECTED	0
5387478	2020-03-24 09:37:51	15391118/B00142	NTS-TC	POLAND	ANT1	1	WORKS CORRECTLY	0
5387325	2020-03-24 09:35:17	15391118/B00142	NTS-TC	POLAND	ANT1	7	GLONASS LOW SAT SIGNALS (0/9)	5387478
5387324	2020-03-24 09:35:17	15391118/B00142	NTS-TC	POLAND	ANT1	7	ANT_GPS_LOW_SIGNAL (0/19)	5387478
5387274	2020-03-24 09:34:28	15391118/B00142	NTS-TC	POLAND	ANT1	8	ANT_TIME_NOT_VALID	5387478
5386142	2020-03-24 09:15:29	15391118/B00142	NTS-TC	POLAND	ANT1	1	WORKS CORRECTLY	0
5386100	2020-03-24 09:14:47	15391118/B00142	NTS-TC	POLAND	ANT1	8	ANT_TIME_NOT_VALID	5387478
5386036	2020-03-24 09:13:42	15391118/B00142	NTS-TC	POLAND	ANT1	7	TIME FRAME FAILURE	5387478
5382831	2020-03-24 08:19:51	15391118/B00142	NTS-TC	POLAND	ANT1	1	WORKS CORRECTLY	0
5382778	2020-03-24 08:18:59	15391118/B00142	NTS-TC	POLAND	ANT1	8	ANT_TIME_NOT_VALID	5387478
5382720	2020-03-24 08:18:03	15391118/B00142	NTS-TC	POLAND	ANT1	7	TIME FRAME FAILURE	5387478
5382591	2020-03-24 08:15:54	15391118/B00142	NTS-TC	POLAND	REFCLK	9	NTP_TIME_NOT_VALID	0
5382335	2020-03-24 08:11:36	15391118/B00142	NTS-TC	POLAND	ANT1	1	WORKS CORRECTLY	0
5382226	2020-03-24 08:09:48	15391118/B00142	NTS-TC	POLAND	ANT1	8	ANT_TIME_NOT_VALID	5387478
5382192	2020-03-24 08:09:16	15391118/B00142	NTS-TC	POLAND	ANT1	9	ANT_FAILURE_NOT_CONNECTED	5387478

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* extra feature

System requirements & recommended IT environment:
VM Virtual Machine:
CPU 8x core, RAM 64GB ,HD 4TB (SSD RAID5 or SAS 10K)
Elproma software basis on Linux Ubuntu Server (x64) v18.04