PROGRESS

microelectronic research institute

ProGeoNet

User Manual

Version 28.10.2024

2024

TABLE OF CONTENTS

PREFACE 4
INTRODUCTION 6
CHAPTER 1. AUTHORIZATION AND LOGIN TO THE PROVIDER'S PERSONAL ACCOUNT 9
CHAPTER 2. BASE STATIONS PANEL 10
CHAPTER 3. MONITORING PANEL 13
CHAPTER 4. ACCOUNTS PANEL 15
CHAPTER 5. RTCM ARCHIVE PANEL 20
CHAPTER 6. STATISTICS PANEL 21
CHAPER 7. ADMINISTRATION PANEL 24

PREFACE

Thank you for purchasing this product. The materials available in this Manual (the “Manual”) have been prepared by NIIMA PROGRESS (“NIIMA PROGRESS”) for owners of NIIMA PROGRESS products. It is designed to assist owners with the use of ProGeoNet Software (PGN) and its use is subject to these terms and conditions (the “Terms and Conditions”). Please read these Terms and Conditions carefully.

TERMS AND CONDITIONS

COPYRIGHT – All information contained in this Manual is the intellectual property of, and copyrighted material of NIIMA PROGRESS. All rights are reserved. You may not use, access, copy, store, display, create derivative works of, sell, modify, publish, distribute, or allow any third party access to, any graphics, content, information or data in this Manual without NIIMA PROGRESS’ express written consent and may only use such information for the operation of your software. The information and data in this Manual are a valuable asset of NIIMA PROGRESS and are developed by the expenditure of considerable work, time and money, and are the result of original selection, coordination and arrangement by NIIMA PROGRESS.

TRADEMARKS – – PGN™, NIIMA PROGRESS® are trademarks or registered trademarks of NIIMA PROGRESS. Windows® is a registered trademark of Microsoft Corporation; Bluetooth® word mark is owned by the Bluetooth SIG, Inc. Product and company names mentioned herein may be trademarks of their respective owners.

DISCLAIMER OF WARRANTY – EXCEPT FOR ANY WARRANTIES IN THIS MANUAL OR A WARRANTY CARD ACCOMPANYING THE PRODUCT, THIS MANUAL IS PROVIDED “AS-IS.” THERE ARE NO OTHER WARRANTIES. NIIMA PROGRESS DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE. NIIMA PROGRESS AND ITS DISTRIBUTORS SHALL NOT BE LIABLE FOR TECHNICAL OR EDITORIAL ERRORS OR OMISSIONS CONTAINED HEREIN; NOR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE FURNISHING, PERFORMANCE OR USE OF THIS MATERIAL. SUCH DISCLAIMED DAMAGES INCLUDE BUT ARE NOT LIMITED TO LOSS OF TIME, LOSS OR DESTRUCTION OF DATA, LOSS OF PROFIT, SAVINGS OR REVENUE, OR LOSS OF THE PRODUCT’S USE. IN ADDITION, NIIMA PROGRESS IS NOT RESPONSIBLE OR LIABLE FOR DAMAGES OR COSTS INCURRED IN CONNECTION WITH OBTAINING SUBSTITUTE PRODUCTS OR SOFTWARE, CLAIMS BY OTHERS, INCONVENIENCE, OR ANY OTHER COSTS. IN ANY EVENT, NIIMA PROGRESS SHALL HAVE NO LIABILITY FOR DAMAGES OR OTHERWISE TO YOU OR ANY OTHER PERSON OR ENTITY IN EXCESS OF THE PURCHASE PRICE FOR PGN.

LICENSE AGREEMENT – Use of any computer programs or software supplied by NIIMA PROGRESS or downloaded from a NIIMA PROGRESS website (the “Software”) in connection with the NIIMA PROGRESS receivers constitutes acceptance of these Terms and Conditions in this Manual and an agreement to abide by these Terms and Conditions. The user is granted a personal, non-exclusive, non-transferable license to use such Software under the terms stated herein and in any case only with a single computer. You may not assign or transfer the Software or this license without the express written consent of NIIMA PROGRESS. This license is effective until terminated. You may terminate the license at any time by destroying the Software and Manual. NIIMA PROGRESS may terminate the license if you fail to comply with any of the Terms or Conditions.

You agree to destroy the Software and manual upon termination of your use of software. All ownership, copyright and other intellectual property rights in and to the Software belong to NIIMA PROGRESS. If these license terms are not acceptable, return any unused software and manual.

CONFIDENTIALITY – This Manual, its contents and the Software (collectively, the "Confidential Information") are the confidential and proprietary information of NIIMA PROGRESS. You agree to treat NIIMA PROGRESS' Confidential Information with a degree of care no less stringent that the degree of care you would use in safeguarding your own most valuable trade secrets. Nothing in this paragraph shall restrict you from disclosing Confidential Information to your employees as may be necessary or appropriate to operate PGN Software. Such employees must also keep the Confidentiality Information confidential. In the event you become legally compelled to disclose any of the Confidential Information, you shall give NIIMA PROGRESS immediate notice so that it may seek a protective order or other appropriate remedy.

WEBSITE; OTHER STATEMENTS – No statement contained at the NIIMA PROGRESS website (or any other website) or in any other advertisements or NIIMA PROGRESS literature or made by an employee or independent contractor of NIIMA PROGRESS modifies these Terms and Conditions (including the Software license, warranty and limitation of liability).

MISCELLANEOUS – The above Terms and Conditions may be amended, modified, superseded, or canceled, at any time by NIIMA PROGRESS. The above Terms and Conditions will be governed by, and construed in accordance with, the laws of Russian Federation, without reference to conflict of laws.

REGULATOY INFORMATION

The following sections provide information on this product's compliance with government regulations.

SCREEN CAPTURES

This manual includes sample screen captures. Your actual screen can look slightly different from the sample screen due to the receiver you have connected, operating system used and settings you have specified. This is normal and not a cause for concern.

TECHNICAL ASSISTANCE

If you have a problem and cannot find the information you need in the product documentation, contact your local dealer. Alternatively, request technical support using the NIIMA PROGRESS World Wide Web site at: https://progeo.expert/en/

INTRODUCTION

ProGeoNet introduces a transformative approach to the positioning and navigation of both stationary and mobile objects by utilizing sophisticated data processing from global navigation satellite systems (GNSS) like GPS, GLONASS, Galileo, Beidou, QZSS, and IRNSS. With advanced methodologies such as RTPK, PPP, and traditional RTK or post-processing, ProGeoNet delivers unmatched precision and reliability.

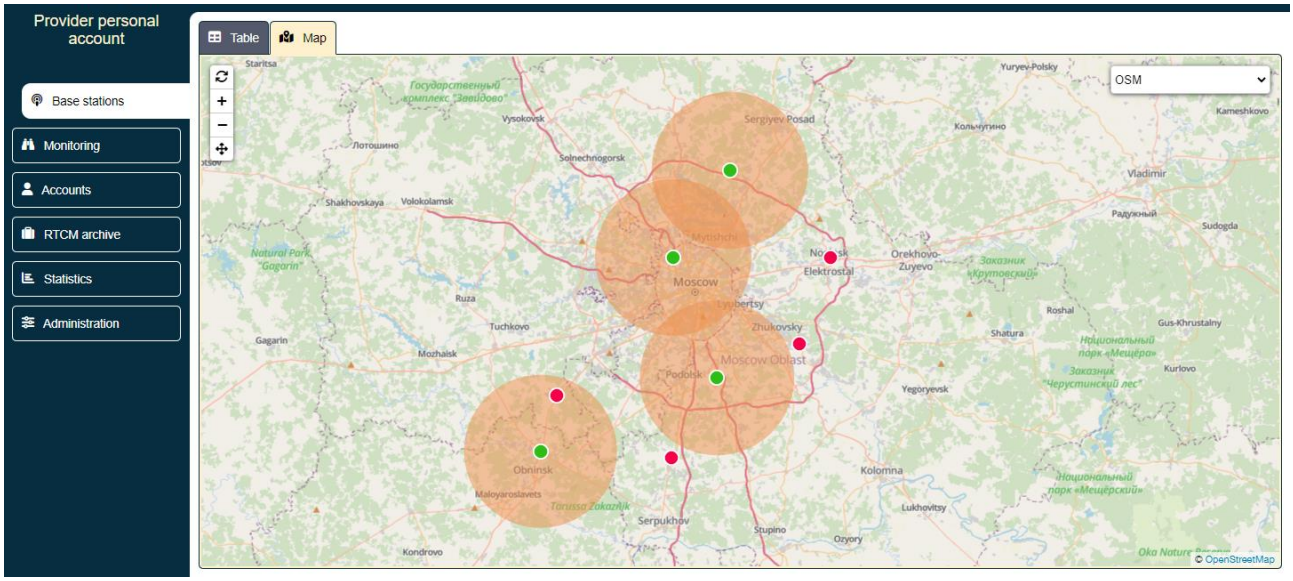


Figure 1 – Web interface

Software Modules Highlight:

- Universal NTRIP Caster: Our NTRIP caster version 2, compatible with Linux and Windows, facilitates the efficient control over GNSS stations and the creation of a continuous coordinate space. It supports:
  - Web interface and console versions for versatile application.
  - NTRIP protocol version 2 for enhanced data transmission reliability and security.
  - Comprehensive streaming and connection billing features, ensuring a robust system for corrective information transmission using RTCM 3.0 and MSM formats.
- Robust Monitoring: Hourly checks on reference stations and daily assessments of position and velocity via PPP in ITRF2014 ensure the precision of your network.
- Advanced RTK Solutions: Our Network Real Time Kinematic over Virtual Reference Station (NRTK VRS) technology delivers superior accuracy, significantly reducing measurement times and improving performance over long distances, even under challenging conditions.

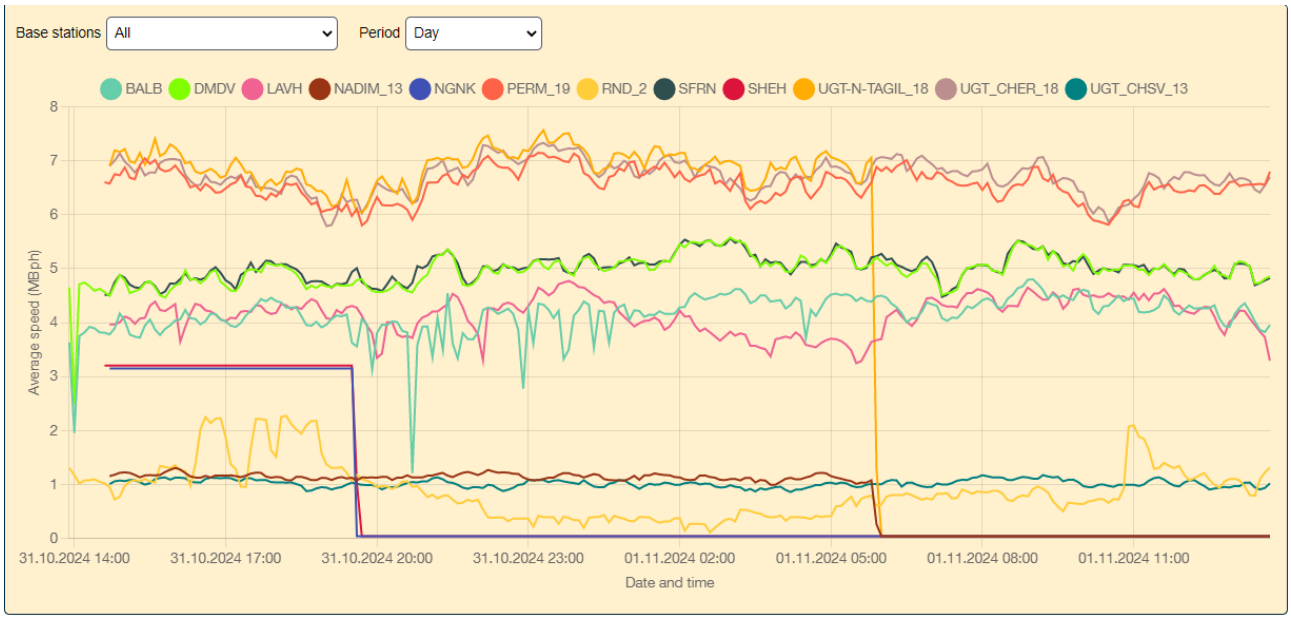


Figure 2 – Base stations control graphs

Advantages:

- Comprehensive Data Integration: Instant access to the latest satellite orbits, clock corrections, weather data, earth surface velocity models, control point coordinates, databases for satellite receiver antennas, and coordinate transformation tools.
- Seamless Software Synchronization: Automatic updates for software modules ensure your system is always at the forefront of GNSS technology.
- Real-Time Network Monitoring: Proactive data and station performance analysis to swiftly identify and resolve anomalies.
- Scalability: Expand your network to meet increasing demands without sacrificing performance.
- Device Compatibility: Supports a wide range of field GNSS data collection devices, ensuring seamless data collection and integration.
- Accessible Anywhere: Securely manage your network and access data through any standard web browser.
- Flexible Deployment: Option for a user-friendly web interface or a console version for advanced functionality.

NRTK (VRS) stands as a pivotal advancement in GNSS positioning, characterized by:

- Enhanced accuracy and reduced measurement times across vast distances.
- Reliable solutions in harsh environments, including urban areas and regions with dense foliage.

- Reduced infrastructure needs by minimizing the number of required base stations and enabling the use of single frequency and mass-market GNSS modules.

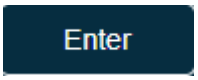
Summary by base stations	**Start:** 02.10.2024	**End:** 01.11.2024
Base station	**Total connection time of all clients (H:M:S)**	**Total traffic amount of all clients (MB)**
BALB	00:25:17	1,91
BALB_30	00:10:51	0,19
BALB_CMR	00:07:36	0,10
DMDV	00:12:54	0,84
DMDV_30	00:02:06	0,00
DMDV_CMR	00:04:10	0,06
UGT_BGDN_18	00:03:53	0,18
UGT_BRZK_19	00:00:15	0,03

Figure 3 – Base stations statistics

CHAPTER 1. AUTHORIZATION AND LOGIN TO THE PROVIDER'S PERSONAL ACCOUNT

The management of the base station network in ProGeoNet is organized through the web interface Provider's Personal Account. It is available at https://lk.progeo.expert. To authorize in the provider's account, the NTRIP user (administrator) enters the used port, login and password (figure 1):

Figure 1 – Login to the provider's personal account

If the data is correct, then after pressing the button 

the main interface of the provider's personal account is displayed, otherwise the corresponding error is displayed (mismatch of port, credentials, expired license, etc.). The values of the *Port* and *Login* fields are saved when the web interface is rebooted, the *Password* field is cleared 3 hours after the last authorization. In the future, the administrator can create new users with other names and passwords that can be used to log in to the Personal Account.

The choice of language between Russian and English is available in the drop-down list located in the upper right corner of the window.

CHAPTER 2. BASE STATIONS PANEL

By default, the Base Stations panel will be opened in the provider's personal account, which is used to view and edit information about mountpoints. The Table tab contains a table containing a list of mountpoints (figure 5):

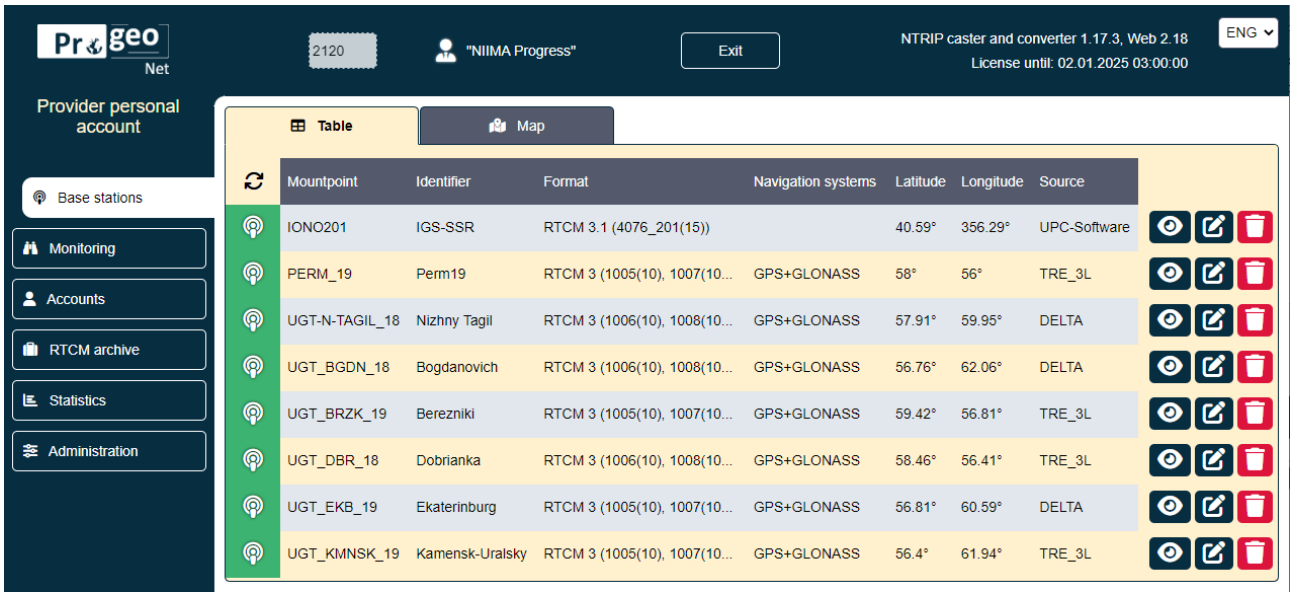


Figure 5 – Table of base stations

The table contains a list of mountpoints and the following information:

- Mountpoint name
- Mountpoint identifier
- Mountpoint messages format
- Navigation systems whose signals are received by the receiver at the base station
- Latitude of the base station
- Longitude of the base station
- Source of information

In the table, the currently active connection stations are highlighted in green on the station icon field, and connection stations that are not transmitting information are highlighted in red.

When button  in the upper left part of the screen is clicking, the information in the table is updated.

By clicking on any place in the line with information about any station, it is possible to get information about this station in the Details tab that opens (figure 6):

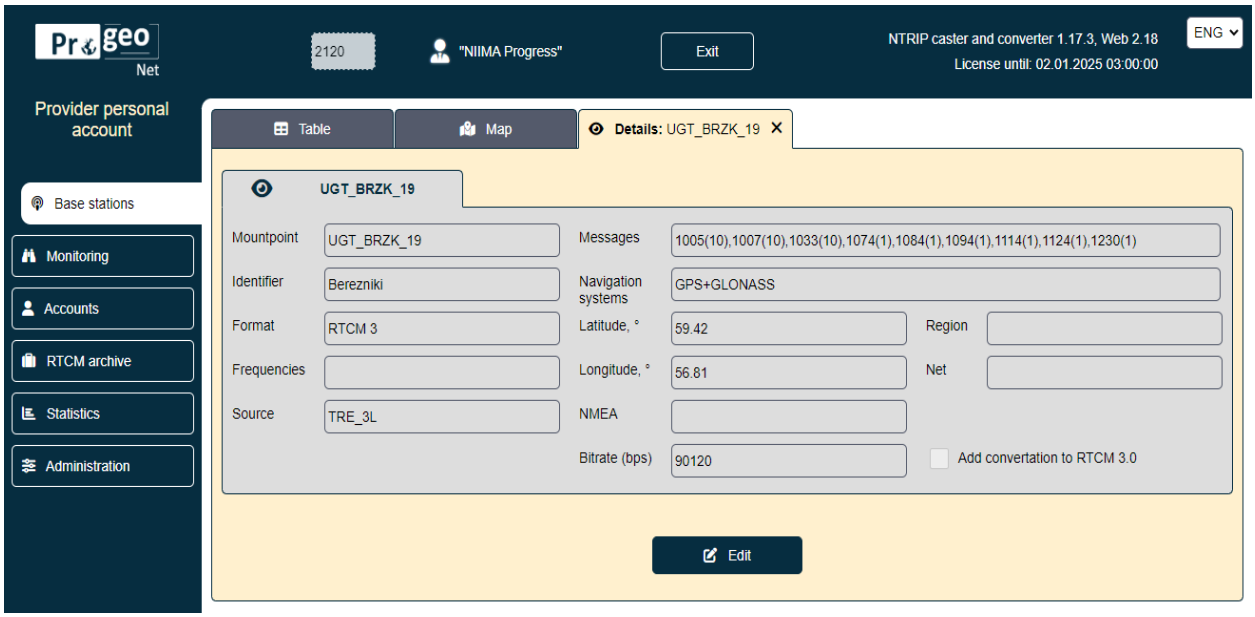


Figure 6 – *Details* tab

If necessary, this information can be edited by clicking the button 

.

After making changes, you can save them by clicking the button 

or cancel editing by clicking the button 

.

At the end of each line with station information there are three buttons with the following functions:

	open a window with detailed information about the station
	open a window with detailed information about the station in edit mode
	remove the mountpoint from the list. The deletion will occur after confirmation (figure 7):

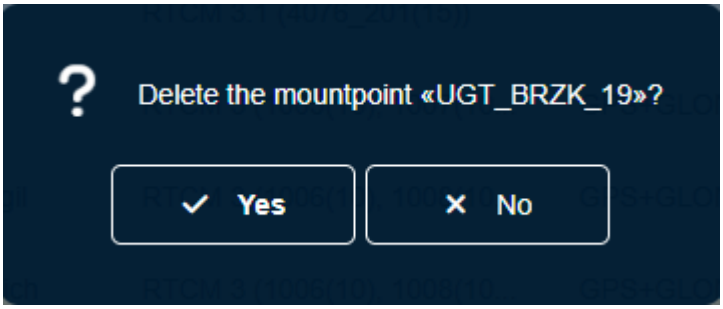


Figure 7 – Confirm mountpoint deletion

Switching to the Map tab allows to see the location of base stations on a scalable map (figure 8):

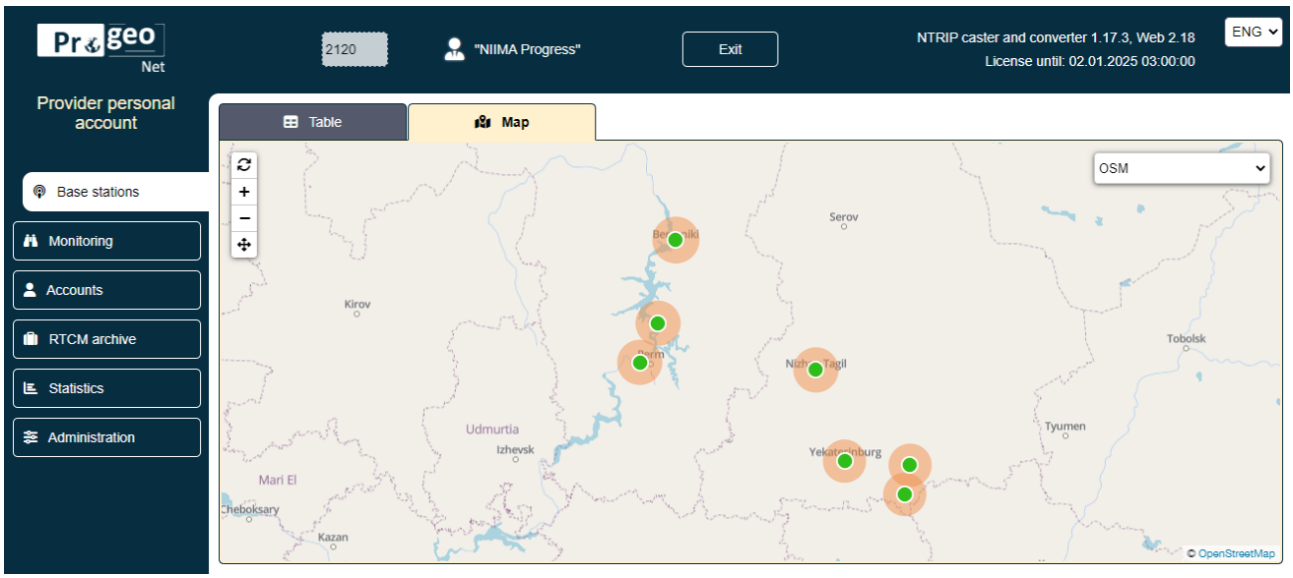


Figure 8 – Base points on the map

The map shows currently active mountpoints in green, and mountpoints that are not transmitting information in red. Switching the map background between three schematic modes (2GIS, CECD, OSM) and the satellite image display mode (Mapbox) is available in the drop-down menu in the upper right corner of the screen (figure 9):

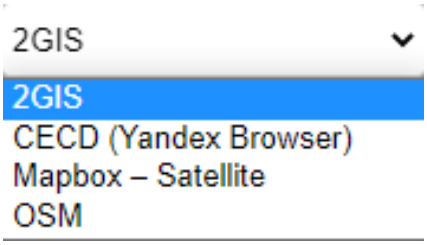
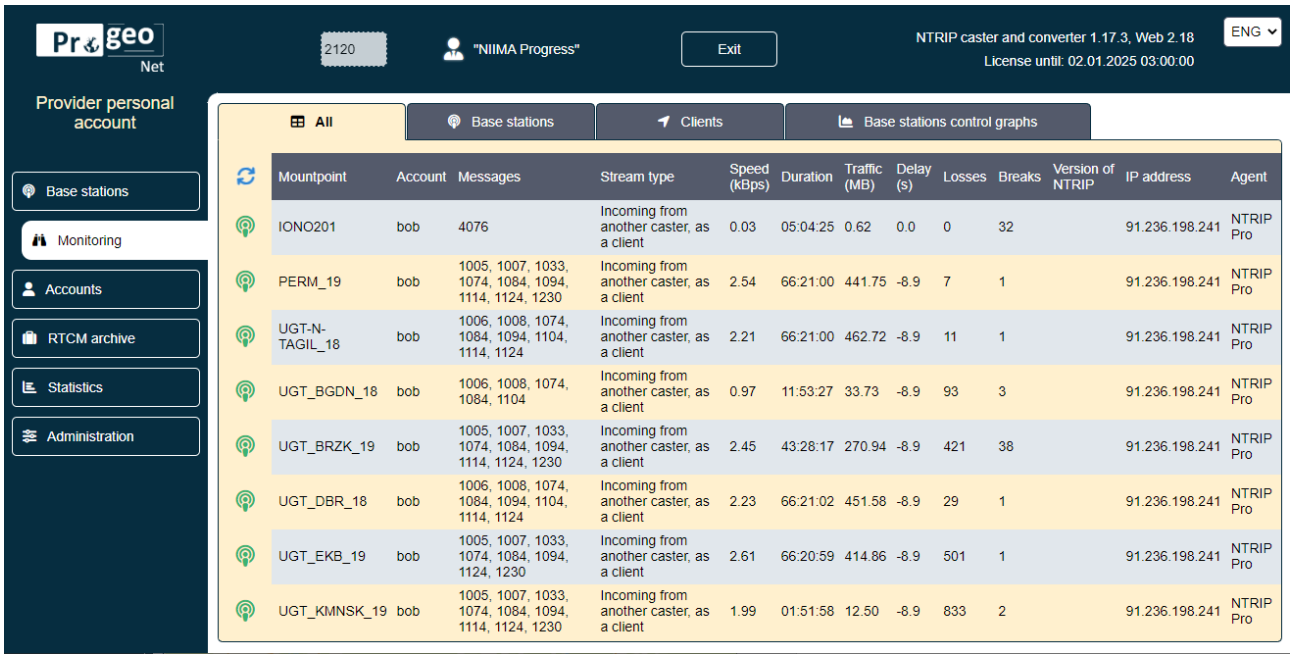


Figure 9 – Display modes

CHAPTER 3. MONITORING PANEL

The Monitoring panel is designed to obtain information about currently active mountpoints, operating both in base station mode and in client mode, and about traffic for each mountpoint (figure 10).



Mountpoint	Account	Messages	Stream type	Speed (kBps)	Duration	Traffic (MB)	Delay (s)	Losses	Breaks	Version of NTRIP	IP address	Agent
IONO201	bob	4076	Incoming from another caster, as a client	0.03	05:04:25	0.62	0.0	0	32		91.236.198.241	NTRIP Pro
PERM_19	bob	1005, 1007, 1033, 1074, 1084, 1094, 1114, 1124, 1230	Incoming from another caster, as a client	2.54	66:21:00	441.75	-8.9	7	1		91.236.198.241	NTRIP Pro
UGT-N-TAGIL_18	bob	1006, 1008, 1074, 1084, 1094, 1104, 1114, 1124	Incoming from another caster, as a client	2.21	66:21:00	462.72	-8.9	11	1		91.236.198.241	NTRIP Pro
UGT_BGDN_18	bob	1006, 1008, 1074, 1084, 1104	Incoming from another caster, as a client	0.97	11:53:27	33.73	-8.9	93	3		91.236.198.241	NTRIP Pro
UGT_BRZK_19	bob	1005, 1007, 1033, 1074, 1084, 1094, 1114, 1124, 1230	Incoming from another caster, as a client	2.45	43:28:17	270.94	-8.9	421	38		91.236.198.241	NTRIP Pro
UGT_DBR_18	bob	1006, 1008, 1074, 1084, 1094, 1104, 1114, 1124	Incoming from another caster, as a client	2.23	66:21:02	451.58	-8.9	29	1		91.236.198.241	NTRIP Pro
UGT_EKB_19	bob	1005, 1007, 1033, 1074, 1084, 1094, 1124, 1230	Incoming from another caster, as a client	2.61	66:20:59	414.86	-8.9	501	1		91.236.198.241	NTRIP Pro
UGT_KMNSK_19	bob	1005, 1007, 1033, 1074, 1084, 1094, 1114, 1124, 1230	Incoming from another caster, as a client	1.99	01:51:58	12.50	-8.9	833	2		91.236.198.241	NTRIP Pro

Figure 10 – Monitoring Panel

The *All*, *Base Stations* and *Clients* tabs contain the following information about mountpoints:

- Mountpoint name
- Account
- Messages
- Stream type
- Speed (in KBps)
- Duration
- Traffic (in Mb)
- Delay (in seconds)
- Losses
- Breaks
- NTRIP version
- IP address
- Agent

The tables in the *Monitoring* panel are updated automatically every 5 seconds. They display only those mountpoints that are currently active. For connected clients, an icon is displayed on the left, the background color of which changes depending on the Client's state: gray - no data, yellow - floating solution, green - fixed solution, red - autonomous solution.

In the *Base Station Monitoring Graphs* tab, traffic graphs are built for each base station (Figure 11):

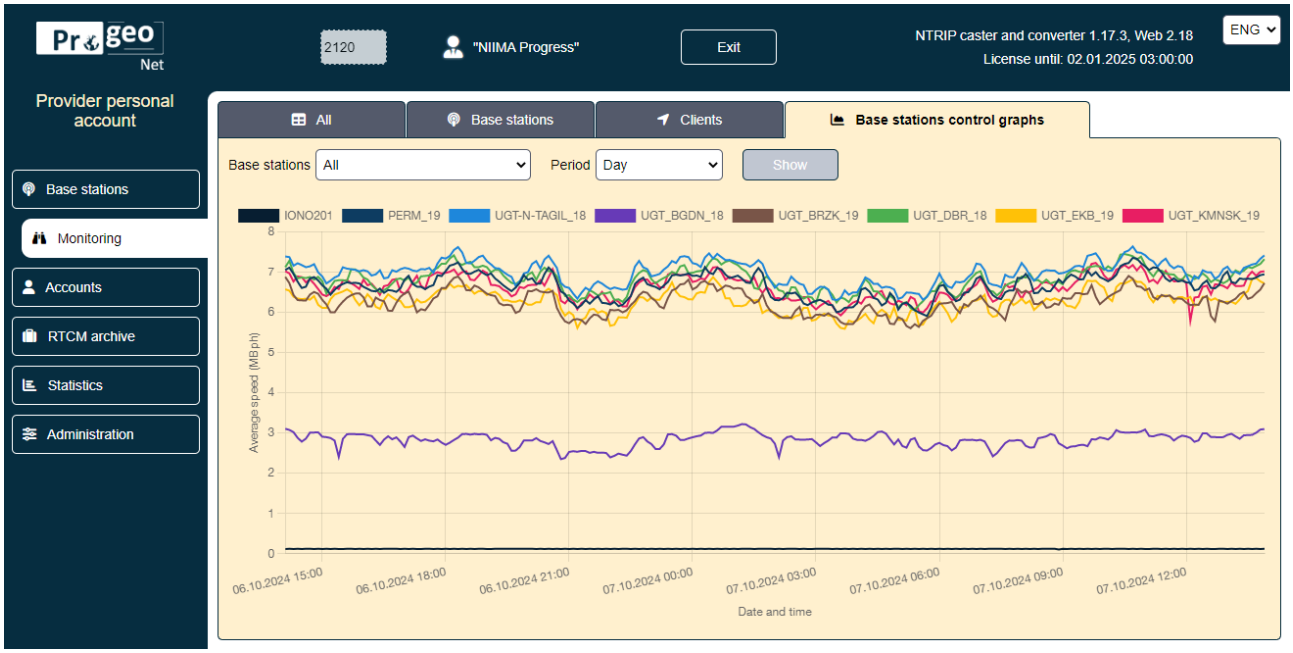


Figure 11 – Tab Base Station Control Graphs

Display of any stations can be turned on/off by clicking on their name in the legend to the graphs. By default, all base stations are displayed, but in the Base stations drop-down list it is possible to choose displaing of the most reliable or the most unstable stations, as well as individually select a specific base station and build a graph only for it. The window with graphs is updated by clicking the button Show.

The graphs are built for time periods: day, week, month and year. The period can be defined in the *Period* drop-down list.

CHAPTER 4. ACCOUNTS PANEL

In the *Accounts* panel, in the *Users* tab, it is possible to create, view, edit or delete an account (figure 12).

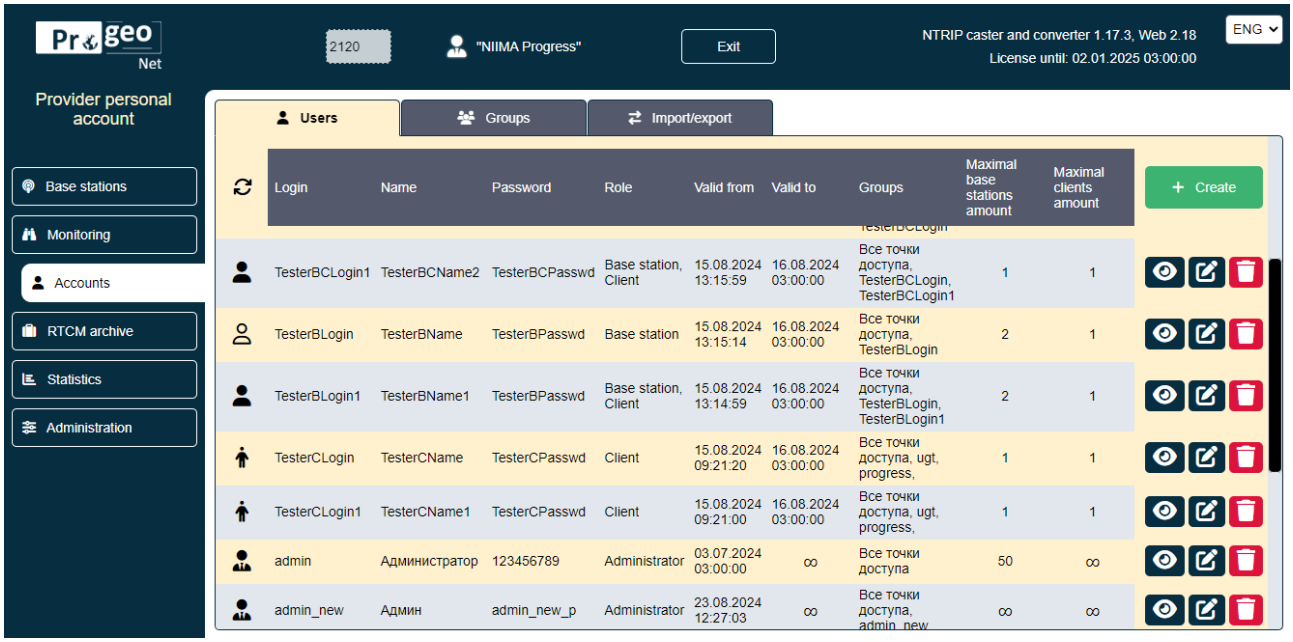


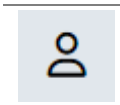
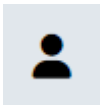
Figure 12 – Accounts panel

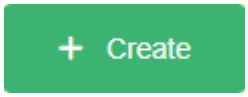
The table contains a list of users with the following information:

- Login
- Name
- Password
- Role (administrator, client, base station or base station+client)
- Valid from - Time and date of activity start
- Valid to - Time and date of activity end
- List of groups
- Maximum stations amount
- Maximum clients amount

Each line is preceded by a symbol that duplicates the text information in the Role column:

	administrator
	client

	base station
	base station+client

To create a new account, click the button  and in the *New User* tab that opens (figure 13), in the left part of the window, enter the login, name, and password, define a role to obtain a certain set of rights, and in the right part of the window, select the maximum number of base stations and clients and determine the dates and times of the start and end of activity:

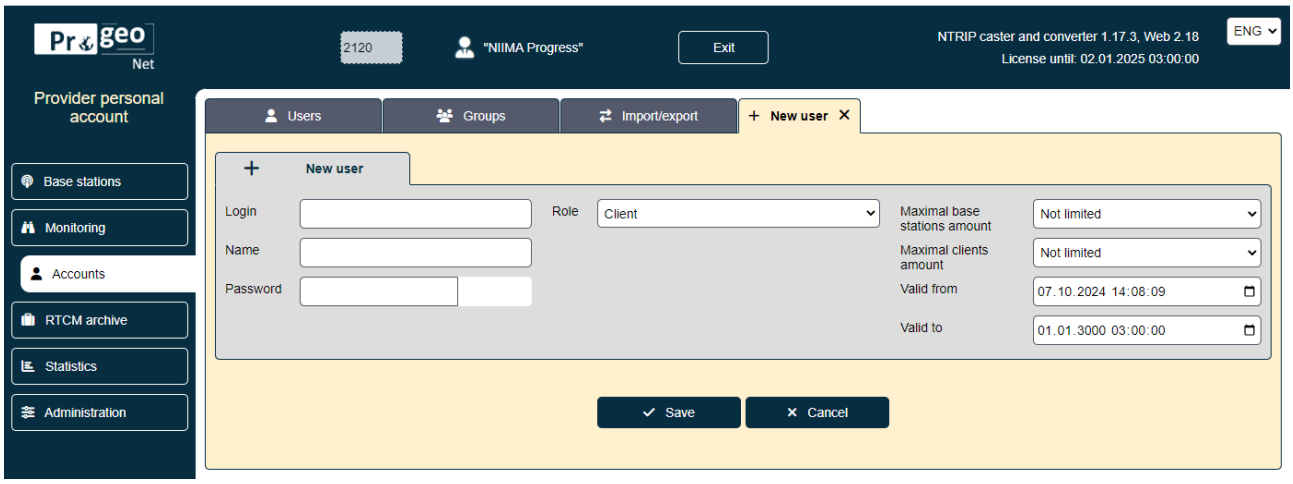
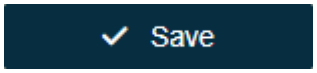


Figure 13 – New User tab

After that, to save the entered parameters and create a new account click the button  or the button  to cancel the input and close the tab.

Following buttons are available for each line.

	open the *Details* window with user information (figure 14)

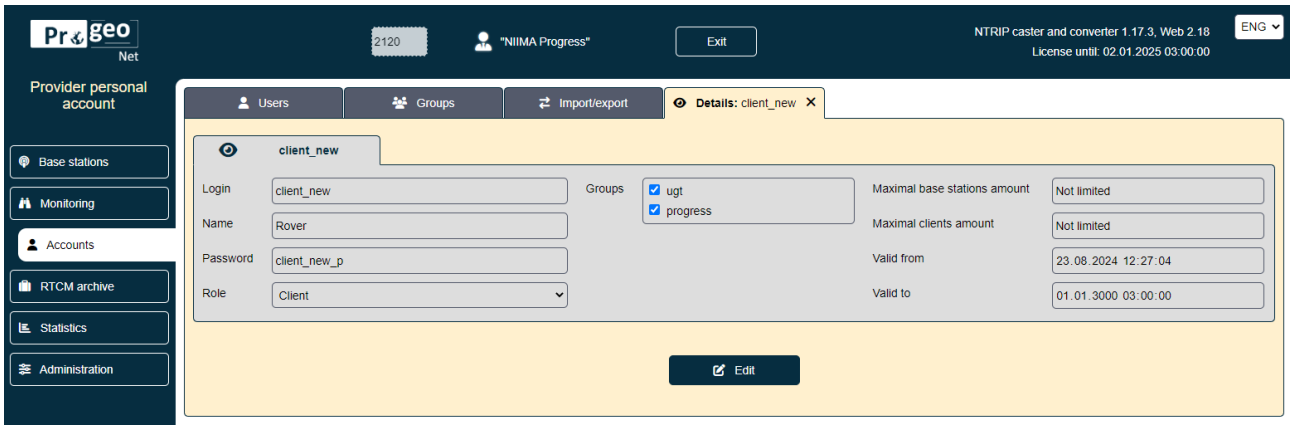


Figure14 – Detailed user information

Editing previously entered information is available by clicking the button 

(figure 15).

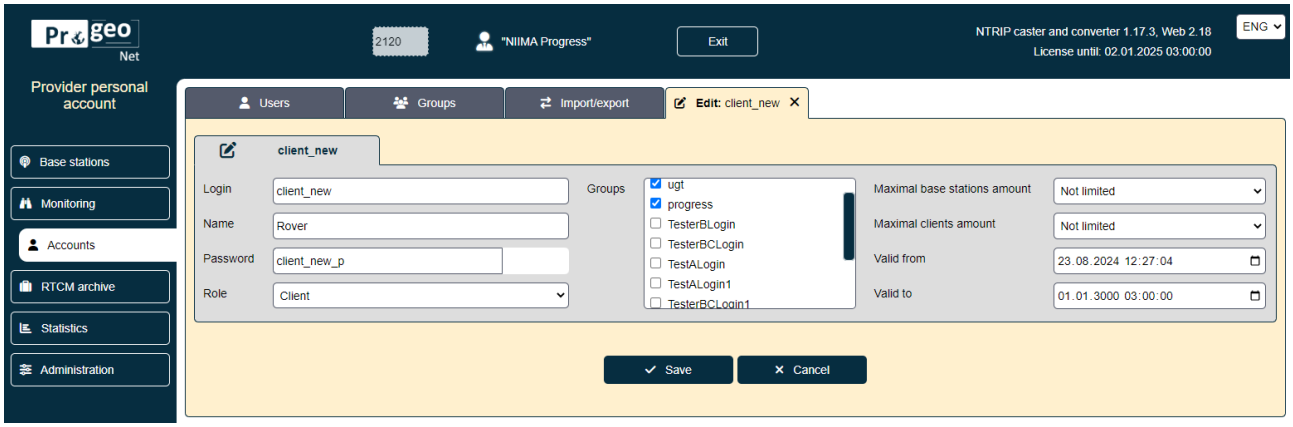
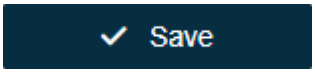


Figure 15 – Editing an account

After editing, to save the parameters, the button 

or button 

to cancel editing and close the tab.

	open the editing window (figure 15) for user information
	delete account. Deletion will occur after confirmation (figure 16)

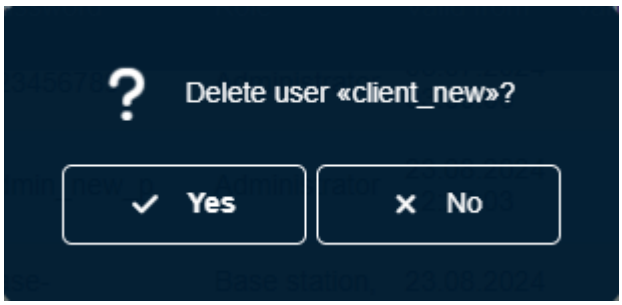


Figure 16 – Confirmation of user deletion

Combining users into groups allows to define connection parameters for several users at the same time. Information about groups can be obtained in the *Groups tab* (figure 17).

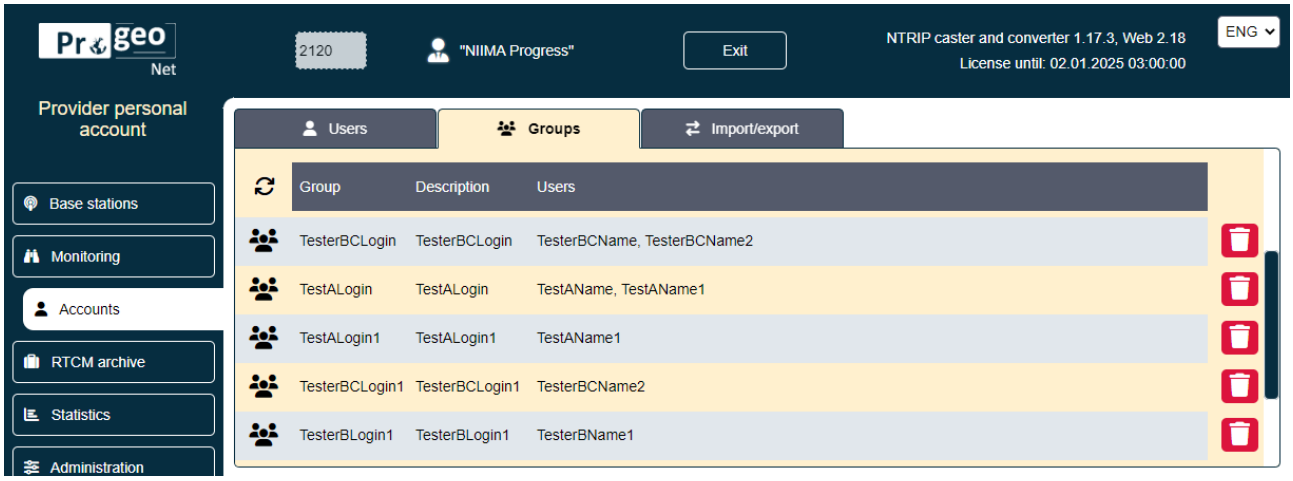


Figure 17 – *Groups* tab

Deletion *Group* will occur by clicking the button after confirmation (figure 18).

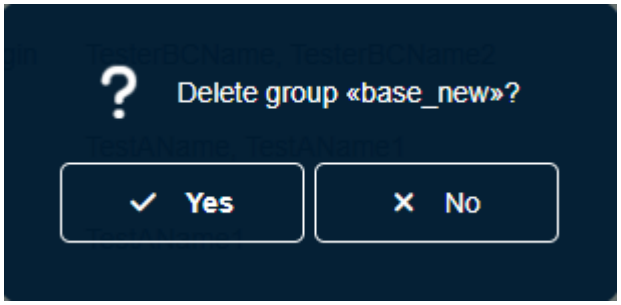


Figure 18 – Confirmation of group deletion

In the *Import/Export* tab, users are imported and exported to the user list from *.CSV files by clicking the corresponding button (figure 19):

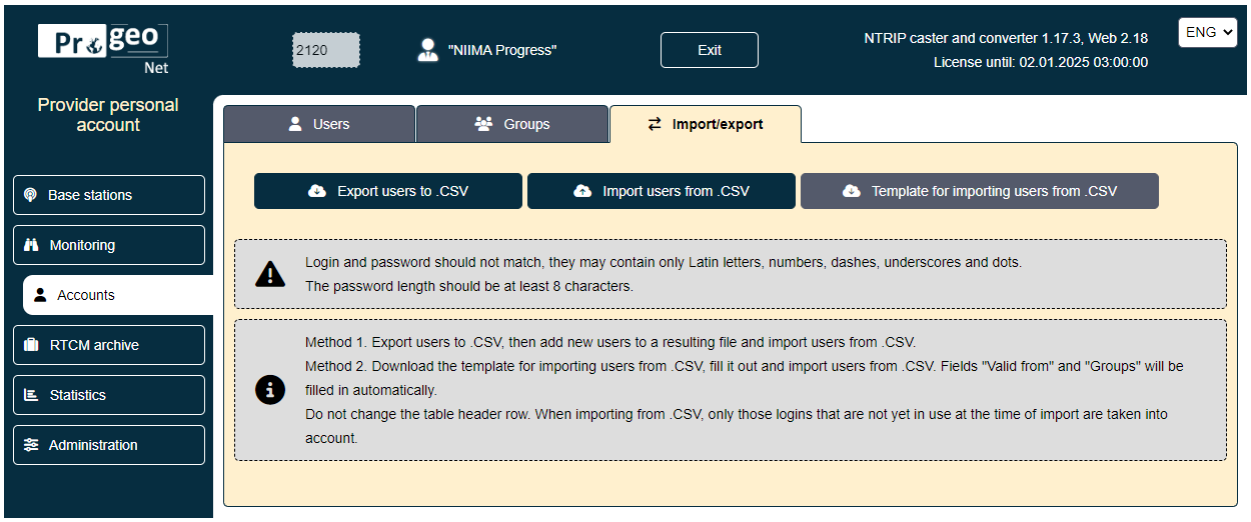
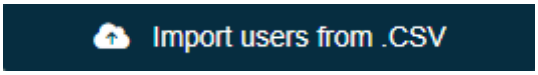


Figure 19 – *Import/Export* tab

To import by button 

there are two options for preparing the file::

1. .Export all users to a *.CSV file, add new lines to this file and import, while existing users will be ignored by the program and new users will be added, about which a corresponding notification will appear (figure 20).

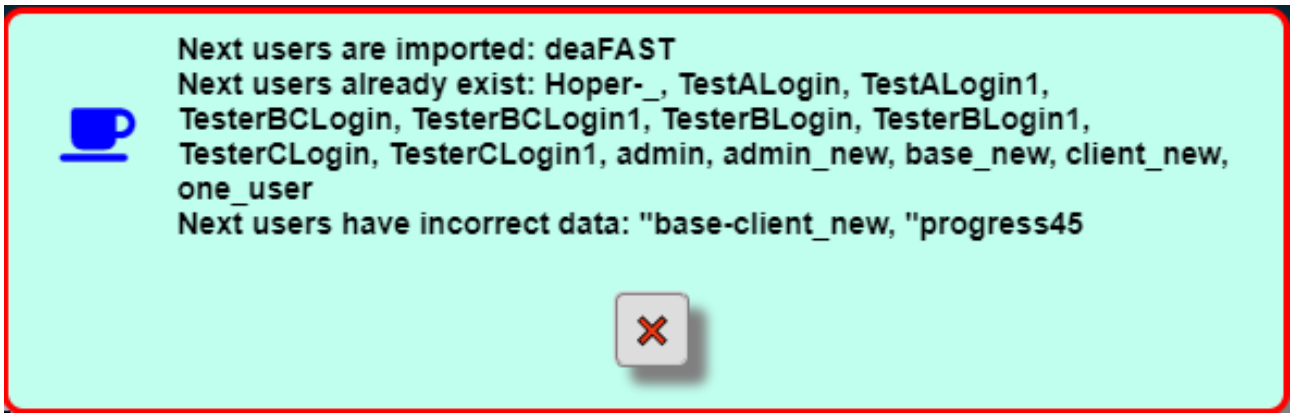
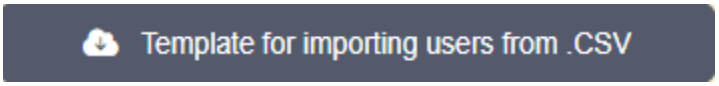


Figure 20 – Message about import results

Also, if necessary, this notification can display a message that some lines are corrupted, that is, they cannot be interpreted.

2. By the button 

download the file as an example, enter the required information and then import. The *Active Since* and *Groups* fields are filled in automatically.

CHAPTER 5. RTCM ARCHIVE PANEL

The RTCM Archive panel is used to download observation files saved in RTCM format (figure 21):

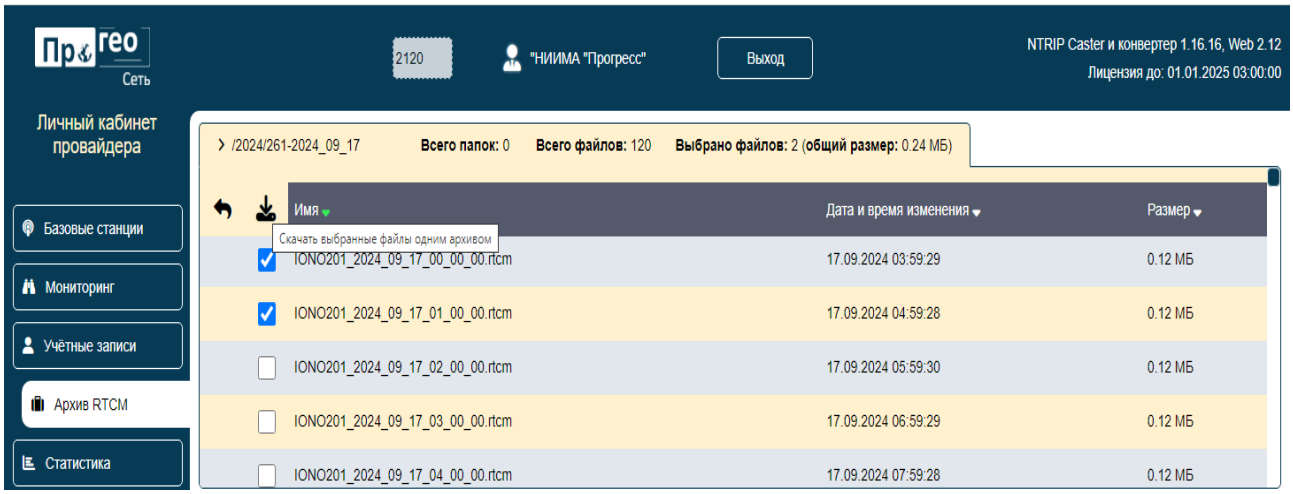


Figure 21 – *RTCM Archive* panel

To download files, it is possible to select from 1 to 25 files. Files are selected by clicking anywhere in the corresponding line. Group selection (deselection) is performed either by holding down the left mouse button and dragging it along the list of files, or by clicking on the first file in the range and clicking on the last file in the file range while holding down the Shift key. If the number of files in the range exceeds 25, the first 25 files are selected.

CHAPTER 6. STATISTICS PANEL

The *Statistics* panel is designed to obtain statistical information about traffic and connection times. Statistics are displayed separately for clients and base stations in three options, the choice of which is made in the *Type* drop-down list (figure 22):

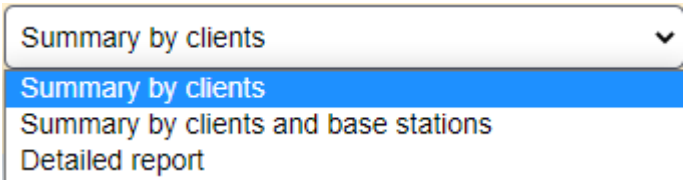
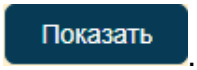


Figure 22 – Statistics type

To confirm your choice of option, press the button 

.

The start and end dates of the time interval for which statistics are displayed are defined in the *Start* and *End* windows.

Depending on the selected option, the following statistical information is displayed:

- Total by clients (Total by base stations)

In the *Clients* tab (figure 23), the following are displayed for each client: the number of days of activity, the total connection time to all base stations, and the total traffic volume from all base stations.

In the *Base Stations* tab, the total connection time of all clients and the total traffic volume of all clients are displayed for each base station.

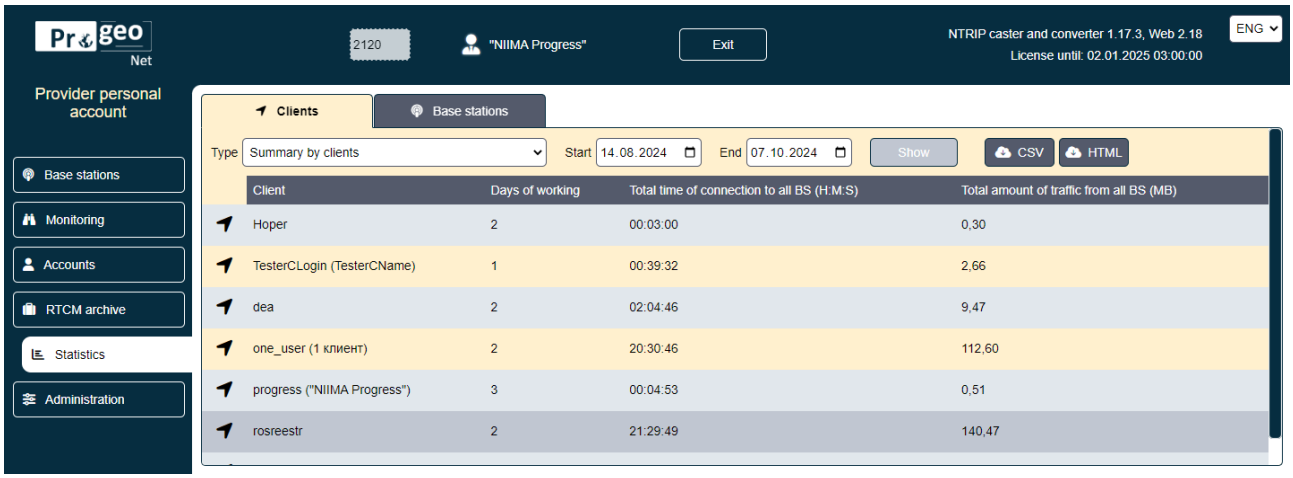


Figure 23 – Total by clients

- Details by clients and base stations

In the *Clients* tab (figure 24), the following are displayed for each client: the base station from which the information was received, the total connection time of the client, and the total volume of client traffic.

In the *Base Stations* tab, the client name, the total connection time of the client, and the total volume of client traffic are displayed for each base station.

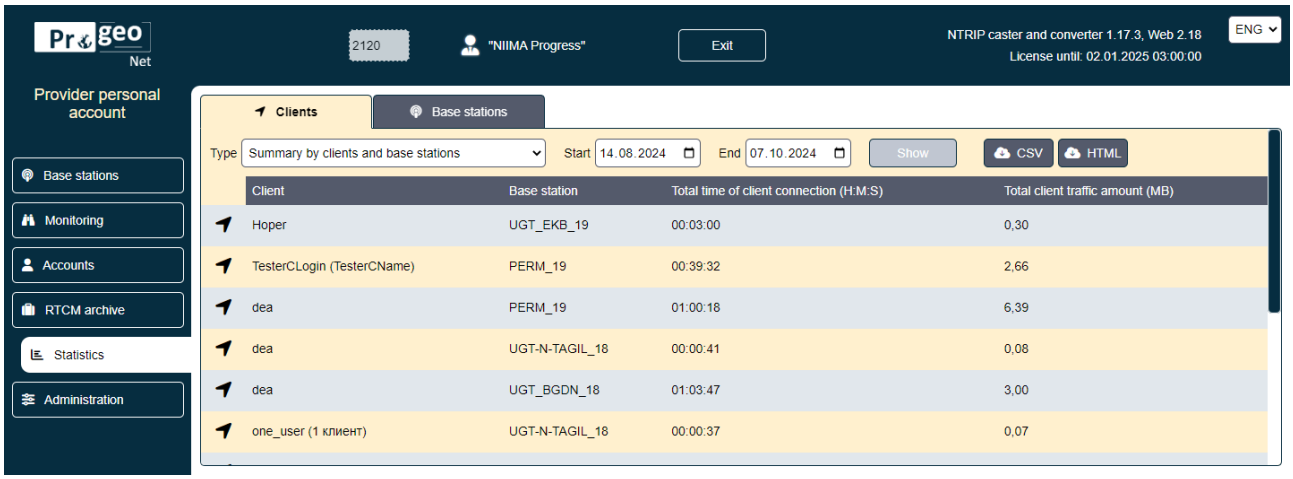


Figure 24– Details by clients and base stations

- Detailed report

In the *Clients* tab (figure 25) for each client the following are displayed: number of days of activity, total connection time to all base stations and total traffic volume from all base stations.

In the *Base Stations* tab for each base station the client name, start and end times and dates of the session, session duration and volume of information received during the session are displayed.

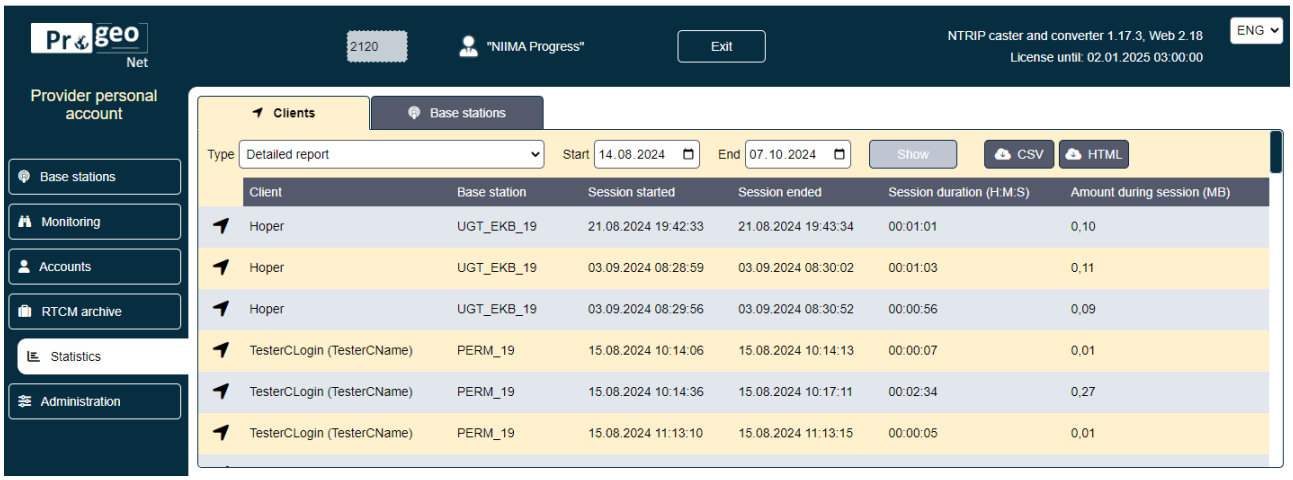


Figure 25 – Detailed report

Buttons  and  allow to export statistical information into files of the appropriate formats.

Detailed report **Start:** 14.08.2024 **End:** 07.10.2024

Client	Base station	Session started	Session ended	Session duration (H:M:S)	Amount during session (MB)
Hoper	UGT_EKB_19	21.08.2024 19:42:33	21.08.2024 19:43:34	00:01:01	0,10
Hoper	UGT_EKB_19	03.09.2024 08:28:59	03.09.2024 08:30:02	00:01:03	0,11
Hoper	UGT_EKB_19	03.09.2024 08:29:56	03.09.2024 08:30:52	00:00:56	0,09
TesterCLogin (TesterCName)	PERM_19	15.08.2024 10:14:06	15.08.2024 10:14:13	00:00:07	0,01
TesterCLogin (TesterCName)	PERM_19	15.08.2024 10:14:36	15.08.2024 10:17:11	00:02:34	0,27
TesterCLogin (TesterCName)	PERM_19	15.08.2024 11:13:10	15.08.2024 11:13:15	00:00:05	0,01
TesterCLogin (TesterCName)	PERM_19	15.08.2024 11:13:32	15.08.2024 11:14:19	00:00:47	0,08
TesterCLogin (TesterCName)	PERM_19	15.08.2024 11:13:37	15.08.2024 11:19:31	00:05:53	0,65

Figure 26 – Statistics

CHAPER 7. ADMINISTRATION PANEL

The *Administration Panel* contains the *Control* and *Journal* tabs. In the *Control* tab it is possible to set permission to display the connection table, save and restore a backup copy of the data, and reboot the caster (figure 27).

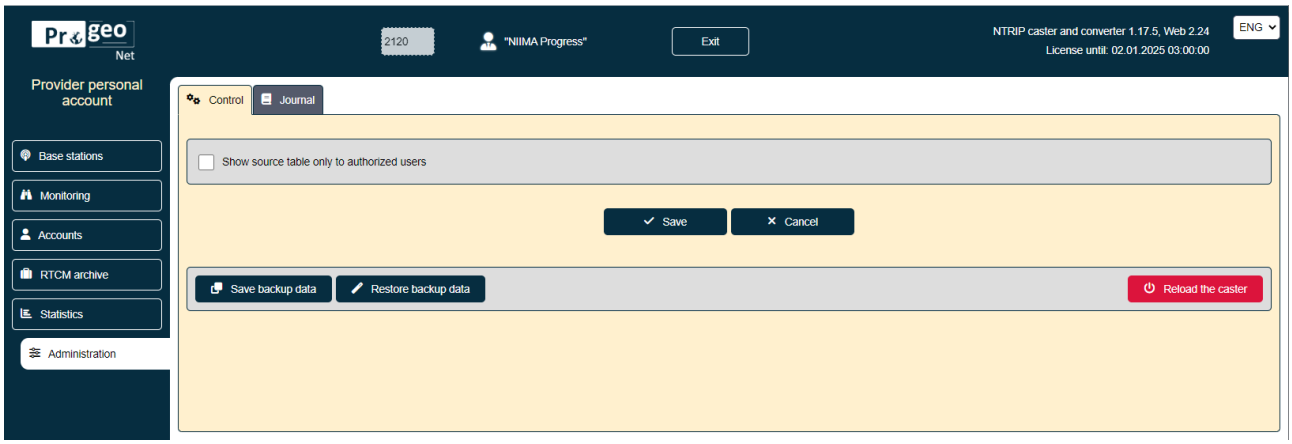


Figure 27 – Administration panel

The *Journal* displays saved messages about the caster's work (logs).