

X. Netbus Pro System System Highlights

Ver 1.3

NETBUS



Modern & Smart Industrial Cloud

The modern & smart industrial cloud solutior

ABOUT

DOWNLOADS

Netbus Pro Cloud System

Netbus Pro Cloud System is the enhanced version of the Netbus Cloud System which provides platform independent solution that works on several modern operating systems running on either standard or embedded hardware. It supports distributed execution of cloud services on wide network infrastructure.

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Preface

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 Storage Server(s) with mongo power

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Standard & Modern Data Exchange Interfaces
Conventional Automation Protocols
OPC Data Exchange Interface
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Custom GUI Generation
Standard GUI Interfaces
Events Interface
Charts Interface
Web Based Setup & Management
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Exploring Netbus Devices through Web Interfaces
Setting and Configuration via Web Interfaces

Powerful Diagnostics Tools via Web Interfaces

<u>netbus.io</u>

1. Preface



Netbus Pro System is an effective "Cloud Software Platform" which contains several data integration services such as data acquisition, collection, management, storage, presentation which supports several communication media as modern data exchange protocols as well as conventional automation protocols to be able to to provide "modern, flexible, scalable and effective" solution.

Netbus Pro Cloud System provides a **platform independent industrial cloud solution** that works on several modern operating systems running on either standard or embedded hardware. It supports **distributed execution of cloud services** on wide network infrastructure. It is perfectly possible to plan and organize the system architecture according to the budget and specification of the project and the customer requirements.

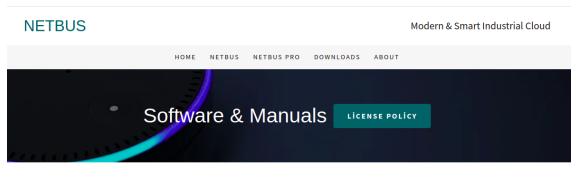
Netbus Pro System has flexible system requirements. It is based on **Open-Source** Software platform principles, it is an **Open-System** which is designed to support well-known software standards and perfectly ready to integrate and exchange data with these applications using modern protocols. Thanks to the flexible system requirements, it is perfectly possible to run Netbus Pro Core applications on a small ARM system as well as full-fledged server platforms.

Netbus Pro System provides an **on-the-edge** well designed "**super fast**" data exchange platform. The "**Distribution Philosophy of The Netbus Services**" and the optional selection of "**Dedicated Hardware for Netbus Pro Core Service**" makes the system and the Netbus Pro Core application super fast and perfectly optimized. Well-organized WebAPI interface provides fastest and effective queries and exporting / importing data chunks in JSON data format for the use of Netbus Pro Services as well as custom services and third party applications.

Netbus Pro System has a **powerful distribution philosophy** with great load balancing and system improvement opportunities. The distribution philosophy of the services and selection of **"Dedicated Hardware for Specific Services"** makes the Netbus Pro System super fast and perfectly optimized. Netbus Pro System runs on arm processors, desktop computers and server platforms as well. It supports **Redundant Operations** in several levels and components of System Architecture.

netbus.io

Netbus Pro System setup utility **can be downloaded from the <u>netbus.io</u> web site** directly. The Setup Utility provides user friendly and straight-forward setup experience.



Software

#	Software	Description	Family	os	Version	Link
1	Netbus Pro System	Core System Software	NetbusPro	Linux	V.1.5.0.0	Download
2	Netbus Pro OPC Gateway	OPC Gateway	NetbusPro	Windows	V.2.1.4.2	Download
3	Netbus OPC Gateway	OPC Gateway	Netbus	Windows	V.1.6.0.0	Download

After the setup, you can access and manage Netbus Pro Systems from anywhere. It is perfectly possible to explore netbus devices through the network. Authorized users may configure, manage and diagnose these devices with web interfaces of the related services easily.

← → C () loca	alhost/applications				> 🖈 🔳 🙂 🛪 🗆 🔕 🗄
Netbus System	Manager Syste	em Applications Users Licences			Clients admin [Administrator]
Application Netbus applications					
application	S	Click to generate new item New			Netbus Applications, Nr Of Items: 14
Actions	Status	Alias	Command	Path	Args Options
Edit Stop	Started	NetbusPro	sudo dotnet exec	/home/root/Publish/Netbus/NetbusPro/NetbusPro.dll	autostart=10
Edit Start	Stopped	NetbusStorageServer	sudo dotnet exec	/home/root/Publish/Netbus/NetbusStorageServer/NetbusStorageServer.dll	
Edit Stop	Started	NetbusGUIGenerator	sudo dotnet exec	/home/root/Publish/Netbus/NetbusGUIGenerator/NetbusGUIGenerator.dll	
Edit Start	Stopped	NetbusS7Link	sudo dotnet exec	/home/root/Publish/Netbus/NetbusS7Link/NetbusS7Link.dll	
Edit Start	Stopped	NetbusModbusLink	sudo dotnet exec	/home/root/Publish/Netbus/NetbusModbusLink/NetbusModbusLink.dll	
Edit Start	Stopped	NetbusModbusRTULink	sudo dotnet exec	/home/root/Publish/Netbus/NetbusModbusRTULink/NetbusModbusRTULink.dll	
Edit Start	Stopped	NetbusIEC104Link	sudo dotnet exec	/home/root/Publish/Netbus/NetbusIEC104Link/NetbusIEC104Link.dll	
Edit Start	Stopped	NetbusEtherCATLink	sudo dotnet exec	/home/root/Publish/Netbus/NetbusEtherCATLink/NetbusEtherCATLink.dll	
Edit Stop	Started	NetbusSimLink	sudo dotnet exec	/home/root/Publish/Netbus/NetbusSimLink/NetbusSimLink.dll	
Edit Start	Stopped	S7PLCSimulator	sudo dotnet exec	/home/root/Publish/Netbus/S7PLCSimulator/S7PLCSimulator.dll	
Edit Start	Stopped	SimIEC104	sudo dotnet exec	/home/root/Publish/Netbus/SimIEC104/SimIEC104.dll	
Edit Start	Stopped	StarComModbusSlaveSim	sudo java -jar	/home/root/Publish/Netbus/StarComModbusSlaveSim/StarComModbusSlaveSim.jar	

2. Netbus Pro System Overview

Netbus Pro System is a "Cloud Software Platform" which contains several services as "data acquisition, collection, management, storage, presentation" which supports "modern data exchange protocols" as well as "conventional automation protocols" to be able to provide "modern, flexible, scalable and effective" solutions.

Netbus Pro System Block Diagram

The block diagram of Netbus Pro System is given below representing several services and integration capabilities of the system.

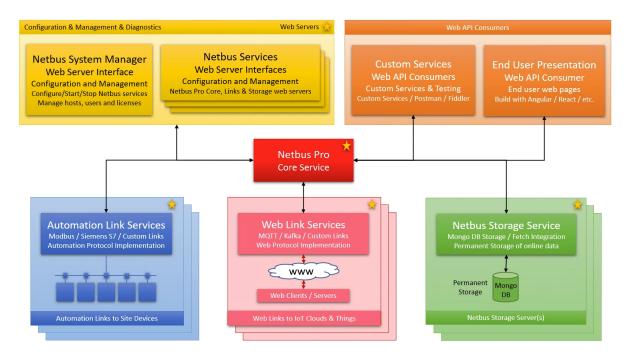


Figure 1: Block diagram of Netbus Pro System

Netbus Application = BackEnd service + Web site

Netbus Pro System consists set of services to achieve data management

Netbus Pro Core Service : Core application, data management & presentation Netbus Storage Service : Storage application, data storage and fetch servers Automation Link Services : Links to Automation Devices Web Link Services : Links to Web Systems Configuration & Management & Diagnostics : Web server interfaces Web API Consumers : Custom Services and End User Presentation services

3. Flexible System Requirements

The flexibility of The System Architecture is the key point for configuring and building a powerful platform and executing the services in the most effective and optimized way.

Netbus Pro System provides huge flexibilities on operating system, hardware system requirements as well as network topology and system architecture.

3.1. Based on Open-Source Software Platform



Netbus Pro System applications are based on the .NET Core platform which is an open-source, general-purpose development platform.

To receive detailed information about Net Core software platform, please visit <u>https://docs.microsoft.com/en-us/dotnet/core/about</u>

.NET Core is an open-source, general-purpose development platform. It is perfectly possible to create .NET Core apps for Windows, macOS, and Linux for x64, x86, ARM32, and ARM64 processors. Frameworks and APIs are provided for cloud, IoT, client UI, and machine learning.

The MIT license can be found at https://github.com/dotnet/runtime/blob/master/LICENSE.TXT

.NET – A unified platform



3.2. Operating System Flexibility







Netbus Pro System can run perfectly on most of the modern operating systems such as Windows, macOS, and Linux. In details it is supported on the following operating systems:

- Alpine: 3.9+
- Debian: 9+
- openSUSE: 42.3+
- Fedora: 26+
- Ubuntu: 16.04+

- RHEL: 6+
- SLES: 12+
- macOS: 10.13+
- Windows Client: 7, 8.1, 10 (1607+)
- Windows Server: 2012 R2 SP1+

For details of Microsoft .Net Core support policy please visit the following web site: <u>https://github.com/dotnet/core/blob/master/release-notes/3.0/3.0-supported-os.md</u>

3.3. Hardware Platform Flexibility



Netbus Pro System can run perfectly on most of the modern hardware platforms. In details it can run on following processors:

- x64
- x86

- ARM32
- ARM64

4. Super Fast Core Service

Netbus Pro System provides an on-the-edge well designed "super fast" data exchange platform.



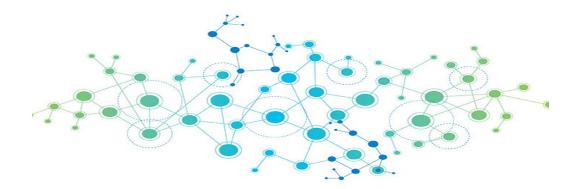
The details of the characteristics of the system and optimization philosophy are given below:

- The core system is simple and dedicated to data management tasks
- The data is accepted and shared through the In-memory platform of the core service
- Permanent storage of the selected data is executed independently from the core service
- System is highly scalable and performance of the system is perfectly upgradable
- System has a powerful distributed operation philosophy with great load balancing and performance improvement opportunities

The detailed explanation of these principles will be explained in the following sections.

4.1. Simple and Powerful : Independent Core Service

"The Netbus Pro Core Application" is a simple and powerful service with a simple web interface. The service is totally dedicated for data-exchange tasks such as accepting and sharing data.



The "Distribution Philosophy of The Netbus Services" and the optional selection of "Dedicated Hardware for Netbus Pro Core Service" makes the system and the Netbus Pro Core application super fast and perfectly optimized.

The Netbus Pro Core service provides only dedicated, independent core services and the Netbus Pro System supports distribution of services. It is perfectly possible to separate the core service from other services and devices and locate it in a protected server room. In this case, the Netbus Pro Core application runs in relatively protected and supervised conditions. Redundant operation of core service might be configured as well as separated permanent storage options and link services located at site might be integrated to this server platform.

4.2. Fastest : In-Memory Data Server with WebAPI



Netbus Pro Core service provides totally In-Memory data accepting and sharing opportunities. The data is accepted and shared totally through the fast and optimized memory of the core. Permanent storage of the selected data is implemented independently from the core application.

Data exchange is performed principally through RESTful WebAPI interface which is on-the-edge modern and fastest data exchange standard of IoT systems and Industry 4.0 platforms.

Highly optimized and well-organized WebAPI interface provides fastest and effective queries and exporting / importing data chunks in JSON data format for the use of Netbus Pro Services as well as custom services and third party applications.

4.3. Scalable System

Thanks to the flexible system requirements, it is perfectly possible to run Netbus Pro Core applications on a small ARM system as well as full-fledged server platforms.



It is perfectly possible to plan and organize **"The System Architecture"** according to the budget and specification of the project and the customer requirements.

Besides, after the installation and commissioning of the system, the extension of the system and the popped-up extra requirements in a particular time may necessitate upgrades in the system. In Netbus Pro Software platform, it is perfectly possible to perform improvements as **"on-the-fly and partial upgrades in the specific service & hardware only"** according to these newly developed requirements.

4.4. Separated and Distributed Services

Netbus Pro System has a powerful distribution philosophy with great load balancing and system improvement opportunities. The distribution philosophy of the services and selection of **"Dedicated Hardware for Specific Services"** makes the Netbus Pro System super fast and perfectly optimized. The "Distributed Operation" capability provides great opportunities given as:

- Flexible system architecture
- Flexible hardware requirements
- Load Balancing Opportunities
- Performance Improvements
- On the fly and partial upgrades
- Easy integration with custom and third party services
- Web based and management of separated and distributed services

4.5. Storage Server(s) with mongo power

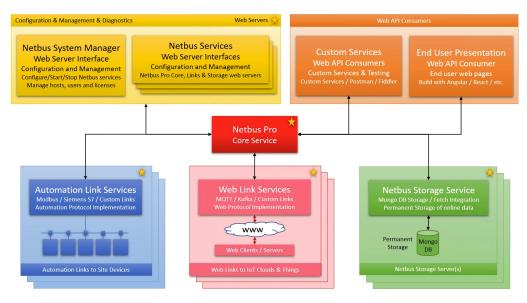


Netbus Pro System performs the permanent storage task of the selected data independently from the core service with a modern, super fast, efficient and standardized method as mongodb database. Besides, It is perfectly possible to organize and configure multiple storage servers on the system which stores multiple copies of the data in a redundant manner. Netbus Pro Core system's data is restored by these services on power up and the data automatically fulfilled on the core promptly.

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5. Distributed Operation

Netbus Pro System is a collection of services which are dedicated for a specific particular task.

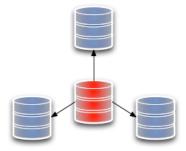


The Netbus Pro System distribution philosophy which is given in a nutshell is as follows : "You may distribute and run any netbus service anywhere in the world on almost any hardware with a network connection". This powerful distribution philosophy provides great flexibility and opportunities which will be given in this section.

5.1. Distribute Services to Several Devices

While all the Netbus Pro System services and utilities cooperate through the network and via "The Netbus Pro Core Service" and its modern and flexible data integration opportunities, all these services can be distributed on different computers on the network. This capability provides great opportunities such as "Load Balancing" and "Performance Improvements" as well as flexible system configuration and particular service upgrades.

5.2. Setup Distributed Storage Server(s)



Netbus Pro System performs the permanent storage task of the selected data independently from the core service with a modern and standardized method as storing data to mongodb database.

It is perfectly possible to organize and configure multiple storage servers on the system which stores multiple copies of the data in a redundant manner. Netbus Pro Core system's data is restored by these services and the data automatically fulfilled on the core.

5.3. Collect Data from Anywhere in the World

Thanks to Netbus Pro Links services which are capable of running anywhere in the world with a network connection, you may perform data acquisition with automation protocols locally and transfer extracted data through modern and effective data exchange interfaces of Netbus Pro Core service. Besides, You may manage, diagnose and test your automation devices' data through user friendly and effective web interfaces easily.



5.4. Manage System from Any Location

Netbus Pro System consists of a set of powerful applications. A Netbus application consists of a dedicated specific service and its web server which provides user friendly GUI to configure, manage and diagnose the service. So the services GUI is presented through web pages and it is perfectly accessible from anywhere in the world through this web interface.



6. Open System

Netbus Pro System is designed to support well-known software standards and perfectly ready to integrate and exchange data with these applications using modern protocols.

6.1. Open Set of Services Ready for Integration

Netbus Pro System is a collection of applications (services + web sites) which cooperate and perform the required tasks collectively.

The Netbus Pro Core application is at the core of the system and provides data integration and sharing platform for all the Netbus services.

It is perfectly possible to generate custom services and integrate them easily to the Netbus Pro software platform through standardized interfaces provided by Netbus Pro Core system.

6.2. Standard & Modern Data Exchange Interfaces

Netbus Pro System Core application provides standard modern data exchange interfaces as:

- WebAPI
- MQTT
- Kafka

6.3. Conventional Automation Protocols

Netbus Pro System provides link services which implement automation protocols to perform data exchange with automation devices. The implemented protocols are listed below:

- Siemens S7 Protocol
- Modbus RTU / TCP
- EtherCAT

Besides, Netbus Pro System provides Energy Automation Protocol Links as given below:

- IEC 61850
- IEC 60870-5-101
- IEC 60870-5-103
- IEC 60870-5-104

All the protocol implementations are presented as independent Link applications (services with web interfaces) for configuration, diagnostics and testing.

6.4. OPC Data Exchange Interface

Netbus Pro System provides OPC UA and OPC DA data exchange interfaces for data exchange with higher / lower third party systems.

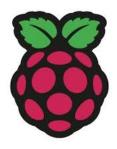
7. Scalable System



Thanks to the flexible system requirements, it is perfectly possible to run Netbus Pro Core applications on small ARM systems as well as full-fledged server platforms. It is perfectly possible to plan and organize **"The System Architecture"** according to the budget and specification of the project.

Besides, after the installation and commissioning of the system, the extension of the system and the popped-up extra requirements in time may require upgrades in the services of the system. In Netbus Pro Software platform, it is perfectly possible to perform upgrades "on-the-fly" and "in the specific service & hardware only" according to these newly developed requirements.

7.1. Light : Netbus Pro System runs on Raspberry PI



Netbus Pro System can run perfectly on ARM based systems in "Light system architecture". For example, an ARM32 / ARM64 release of Netbus Pro Core software can run on a Raspberry PI system. It is perfectly possible to execute a subset of services on a particular Raspberry PI device as well as a full set of Netbus Pro Core software. Obviously, the system configuration, data acquisition map, the performance requirements and the budget of the project might enlight and specify the configuration and design of a particular "Netbus Pro System Architecture".

7.2. Medium : Netbus Pro System runs on Desktop PCs

Netbus Pro System can run perfectly on desktop computers. In a Netbus Pro System, the number of computers used in the system architecture as well as hardware specification of these computers and network topology of the system is totally flexible. Wide range of CPU / Memory / Storage System options might be selected as the components of the System Configuration which varies according to the system specification and requirements of the customer.



7.3. Pro : Netbus Pro System runs on Server Platforms

Netbus Pro System can fit perfectly on server computers which are located in a protected server room with limited and authorized access. The number of servers as well as hardware specification of them and network topology of the entire system is totally flexible thanks to Distributed Service Philosophy of Netbus Pro System. Wide range of Server platform options might be selected which varies according to the system specification and requirements of the customer including totally virtualized platforms as well as dockerized systems.

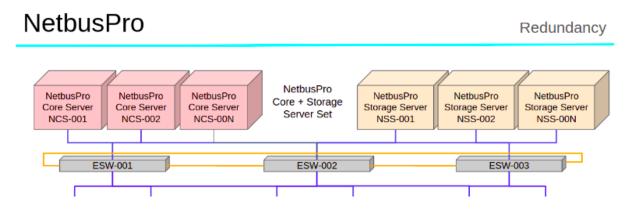
8. Redundant System

Netbus Pro System supports Redundant Operations in different levels and components of System Architecture. In this section, the redundancy options will be explained.



8.1. Netbus Pro Core Redundancy

Netbus Pro System perfectly supports core redundancy. Netbus Pro Core System might be executed separately on the same computer (with different TCP ports) as well as on different computers perfectly. The Netbus data provider services (for example Link services) supports multiple data transmission capabilities for more than one core service simultaneously. In this case more than one core will be available at a time and providers feed the core services simultaneously. The consumer applications check availability of the core servers and choose to connect the preferred live server to get data. In a fail case the consumer could switch to the standby core server and operate without interruption.



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8.2. Netbus Pro Storage Server Redundancy

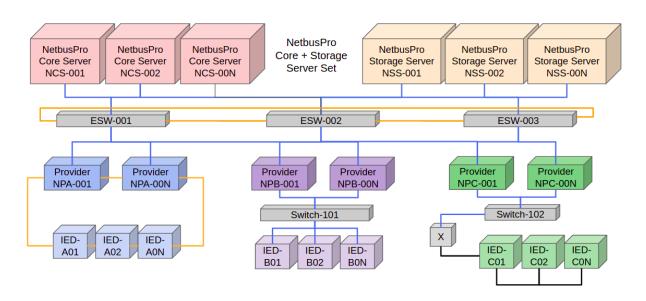
Netbus Pro Storage server stores the online data of Netbus Pro Core service to the persistent mongodb database. It is perfectly possible to run more than one Netbus Pro Storage server simultaneously and direct the data source to any Netbus Pro Core service. So, multiple Netbus Pro Storage servers run side by side and store the data of the Netbus Pro Core service simultaneously. In a fail situation of the core service, any active Netbus Storage server will fulfill the missing data in Netbus Pro Core. If the Netbus Storage server fails, it will receive the data from the Netbus Pro Core service when boot up and store this new data automatically to the persistent media.

8.3. Netbus Pro Link Services Redundancy

Netbus Pro System supports Link-Services-Redundancy. While Netbus Pro Core system is a WebAPI core, it listens to the data transfers from providers and processes any data received from the providers. Providers manage active / standby roles in-between to prevent double data storage in the Netbus Pro Core system.

NetbusPro

Redundancy



On the other hand Netbus Pro Link services support transfer of retrieved data to Netbus Pro Core server(s) simultaneously. The Up-link definition of the Link service might contain more than one core service simultaneously and it transfers its data to both core servers automatically.

9. Multi Platform Graphical User Interfaces (GUIs)

9.1. Open & Flexible GUI Presentations

Netbus Pro System provides an open and flexible as well as multi platform and web friendly infrastructure to generate and present powerful Graphical User Interfaces (GUIs).

Netbus Pro System's NetbusGUIGenerator service imports the user generated GUIs and presents them through the web interface besides the Standard GUI pages which provides powerful tools such as Event Viewer and Chart Viewer.



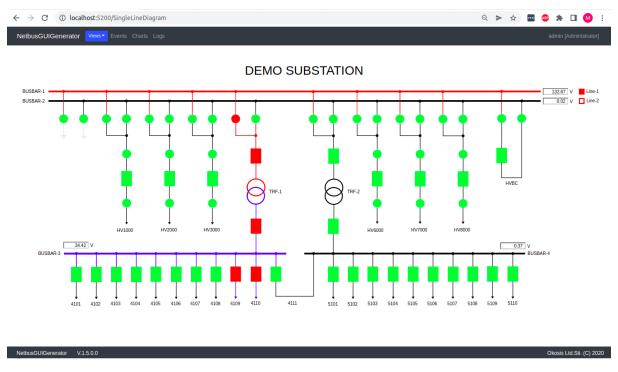
It is perfectly possible to build any GUI page via SVG diagrams and javascript coding interface.

Some example SCADA applications are listed below:

- Energy Automation Systems (e.g. Single Line Diagrams)
- Process Automation Systems
- Factory Automation Systems
- Machine Automation and Reporting Systems
- Overall Equipment Efficiency (OEE) Systems
- Billing and Reporting Systems
- Data Acquisition and Collection Systems

9.2. Web Based Presentation with Multi Platform Support

Thanks to modern, standard, effective data exchange interfaces of Netbus Pro Core System. It is easy to integrate the web based flexible user interfaces to Netbus Pro System effectively.



• Use your computer's web Browser and a Mobile Phone as the Client Screen

The web pages generated using standard web production tools and "Netbus Javascript Library" can be visualized on any web browser including phone, tablet, desktop etc. So the desktop computer and your handheld device becomes a Client Screen for the Netbus Pro System.

• Access the presentation from Anywhere

While the Netbus Pro System GUIs are designed as web pages it is perfectly possible to access these web pages through the internet from anywhere in the World.

• GUI Design using standard tools

Designing the GUIs with standardized html / web production tools provides highly flexible generation opportunities. You may design your own GUI easily using the "Netbus Interfacing Software Library for javascript" provided by Okosis.

• GUI Programming with standard javascript

The programming of GUI pages is done using javascript language. Okosis provides a javascript library containing utility functions for interfacing Netbus Core System. You may design your own GUI easily and embed javascript library as well as your own generated functionality cooperated with the effective Netbus Pro Core System.

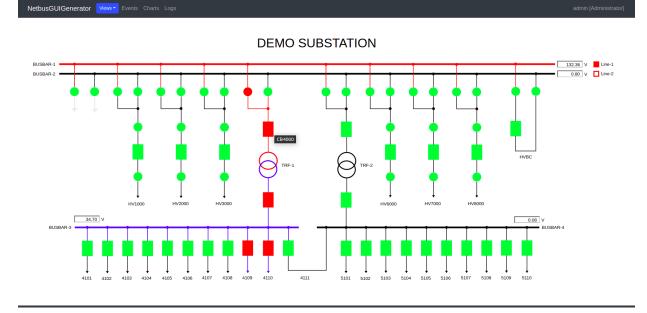
NetbusGUIGenerator V.1.5.0.0

9.3. Netbus GUI Generator Application

Netbus GUI Generator application provides easy integration with custom pages of the users and generates web pages and web links automatically. Users may design custom GUIs and transfer related files to the Netbus GUI folders. The Netbus GUI Generator software integrates users' GUIs using the NetbusGUIGenerator application and javascript libraries provided by Okosis.

\leftrightarrow \rightarrow C (i) localhost:5200		> ★ 🔤 😂 🗯 🖬 🔕 E
NetbusGUIGenerator Views - Even	Is Charts Logs	admin [Administrator]
Netbus GUI Gee SingleLineD Welcome to Netbus GUI Generator web marina	agram	
	Netbus Pro GUI Generator application provides Graphical User Interface (GUI) for the Netbus Pro System. The pages prepared for this application is given below : MachineSimulation SingleLineDiagram	
Internal Applications Others		
Action Function	Explanation	
Views - Diagnostic	s The Webapi diagnostics page	

Users generate custom views given in SVG presentation format with provided javascript libraries and javascript programming interface which result in totally web friendly powerful interfaces.

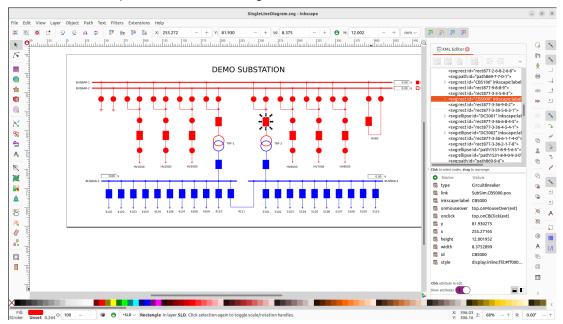


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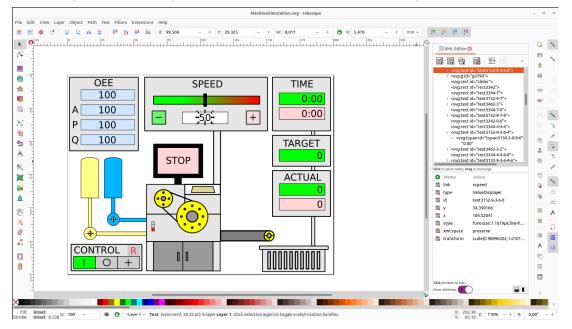
9.4. Custom GUI Generation

The users may design their custom GUIs using any software platform that has the capability to access WebAPI RESTful interface which is supported by modern software platforms perfectly.

Here is the Inkscape software used to generate SVG files to be shown in the custom GUIs.



The SVG files are embedded in html pages and animated via javascript libraries which is supplied by Netbus Pro System infrastructure that provides easy access to Netbus Pro data.



9.5. Standard GUI Interfaces

Netbus Pro System provides standard SCADA utility pages to provide a powerful web SCADA interface by default. The sample standard user interfaces will be given here.

• Events Interface

The Event Viewer page is prepared by default and ready to use.

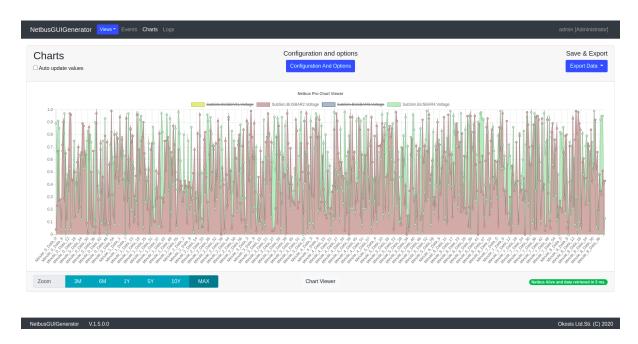
NetbusGUIGener	ator Views - Events Charts Logs				admin [Administrator]
Events					
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events	Filter id	¢ *	A	pply	In Memory Events, Nr Of Items:
ld	Text	Type TimeStamp	Tag	Value	Quality Extra
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6378678724919601	Equipment position change of CB4109	Event 2022-04-29 00:00:49.196	CB4109.pos	ON	Good SubSim
6378678724736800	Equipment position change of CB4110	Event 2022-04-29 00:00:47.368	CB4110.pos	ON	Good SubSim
6378678724485600	Equipment position change of CB4100	Event 2022-04-29 00:00:44.856	CB4100.pos	ON	Good SubSim
6378678724234200	Equipment position change of DC4001	Event 2022-04-29 00:00:42.342	DC4001.pos	ON	Good SubSim
6378678724044600	Equipment position change of DC4002	Event 2022-04-29 00:00:40.446	DC4002.pos	OFF	Good SubSim
6378678723696200	Equipment position change of DC4002	Event 2022-04-29 00:00:36.962	DC4002.pos	ON	Good SubSim
6378678723520700	Equipment position change of CB4000	Event 2022-04-29 00:00:35.207	CB4000.pos	ON	Good SubSim
6378678722910799	Machine Simulation generated a good product.	Product 2022-04-29 00:00:29.108	MacSim.product	{"A":100,"P":40,"Q":100,"OEE":40}	Good MacSim
6378678721100800	Machine Simulation generated a good product.	Product 2022-04-29 00:00:11.008	MacSim.product	{"A":100,"P":50,"Q":100,"OEE":50}	Good MacSim
6378678720490801	Machine Simulation generated a good product.	Product 2022-04-29 00:00:04.908	MacSim.product	{"A":100,"P":50,"Q":100,"OEE":50}	Good MacSim
6378678719880800	Machine Simulation generated a good product.	Product 2022-04-28 23:59:58.808	MacSim.product	{"A":100,"P":33,"Q":100,"OEE":33}	Good MacSim
NetbusGUIGenerator	V.1.5.0.0				Okosis Ltd.Sti. (C) 20

Filtering of Events by several fields are provided as well in the Events page.

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• Charts Interface

The Charts Viewer page is prepared by default and ready to use.



Users can select tags and colors as well as time period from user-friendly interfaces.

Charts Dauto update values		Pens Query Options		Save & Exp
J Auto update values		Selected Pens	Add New Pen	
140		SubSim.BUSBAR1.Voltage	x	
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		SubSim.BUSBAR3.Voltage	x	
80		SubSim.BUSBAR4.Voltage	x	
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Zoom 3M 6M	1Y 5Y 10Y	MAX Chart Viewer		Netbus Alive and data retrieved in 6

# 10. Web Based Setup & Management

Netbus Pro System can be downloaded from the <u>https://www.netbus.io</u> web site and can be set up easily in a couple of minutes.

NETBUS	Modern & Smart Industrial Cloud
	HOME NETBUS NETBUS PRO DOWNLOADS ABOUT
С. С.	Software & Manuals LICENSE POLICY
	Software

#	Software	Description	Family	os	Version	Link
1	Netbus Pro System	Core System Software	NetbusPro	Linux	V.1.5.0.0	Download
2	Netbus Pro OPC Gateway	OPC Gateway	NetbusPro	Windows	V.2.1.4.2	Download
3	Netbus OPC Gateway	OPC Gateway	Netbus	Windows	V.1.6.0.0	Download

It is perfectly possible to explore netbus devices on the network (or with the IP Address of the device) and the users may access to configure, manage and diagnose these devices through the web pages of the related services. In this section the web based setup and management of the netbus devices will be mentioned.

Netbus System Manager		
Netbus System Mar Velcome to Netbus System Manager w	0	web interface to configure device's description and settings. The following actions are realised using this interface:
Internal Applications Links	Enter description of this     Define Netbus applicat     Edit, Add, Remove and     Manage installed lices,     Inspect running host, v     On a real computer, vie     View detailed diagnost     Explore clients existing	
Action	Function	Explanation
System	System	The system configuration
System Applications	System Applications	The system configuration The applications list and start / stop actions
Applications	Applications	The applications list and start / stop actions
Applications Users	Applications Users	The applications list and start / stop actions The Users editing page

#### 10.1. Easy Installation

Netbus Pro System can be downloaded from the web site <u>https://netbus.io/links</u> and can be set up with **Netbus Utility for Setup / Removal / Extraction Tool (NUSRET).** 

The User runs "sudo ./install.sh" and the installation of the system is done automatically without any user interference and the Netbus Pro System becomes ready to run in a couple of minutes.

The "License requesting and receiving" actions are performed through Netbus System Manager web site's licenses page. You may request a license through the web interface and when the license is issued, you may access your license by requesting it from the web site.

$\rightarrow$ C (i) loc	alhost/applications				> 🖈 🔳 🧐 🗯
letbus System	n Manager Syste	em Applications Users Licences	Host Config Virtual	Logs	Clients admin (Admir
pplicatio	ns				
tbus applications					
application	IS	Click to generate new item New			Netbus Applications, Nr Of Items:
Actions	Status	Alias	Command	Path	Args Options
Edit Stop	Started	NetbusPro	sudo dotnet exec	/home/root/Publish/Netbus/NetbusPro/NetbusPro.dll	autostart=10
Edit Start	Stopped	NetbusStorageServer	sudo dotnet exec	$/\ home/root/Publish/Netbus/NetbusStorageServer/NetbusStorageServer.dll$	
Edit Stop	Started	NetbusGUIGenerator	sudo dotnet exec	$/\ home/root/Publish/Netbus/NetbusGUIGenerator/NetbusGUIGenerator.dll$	
Edit Start	Stopped	NetbusS7Link	sudo dotnet exec	/home/root/Publish/Netbus/NetbusS7Link/NetbusS7Link.dll	
Edit Start	Stopped	NetbusModbusLink	sudo dotnet exec	/home/root/Publish/Netbus/NetbusModbusLink/NetbusModbusLink.dll	
Edit Start	Stopped	NetbusModbusRTULink	sudo dotnet exec	/ home/root/Publish/Netbus/NetbusModbusRTULink/NetbusModbusRTULink.dll	
Edit Start	Stopped	NetbusIEC104Link	sudo dotnet exec	/home/root/Publish/Netbus/Netbus/EC104Link/Netbus/EC104Link.dll	
Edit Start	Stopped	NetbusEtherCATLink	sudo dotnet exec	/ home/root/Publish/Netbus/NetbusEtherCATLink/NetbusEtherCATLink.dll	
Edit Stop	Started	NetbusSimLink	sudo dotnet exec	/home/root/Publish/Netbus/NetbusSimLink/NetbusSimLink.dll	
Edit Start	Stopped	S7PLCSimulator	sudo dotnet exec	/home/root/Publish/Netbus/S7PLCSimulator/S7PLCSimulator.dll	
Edit Start	Stopped	SimIEC104	sudo dotnet exec	/home/root/Publish/Netbus/SimIEC104/SimIEC104.dll	
Edit Start	Stopped	StarComModbusSlaveSim	sudo java -jar	/home/root/Publish/Netbus/StarComModbusSlaveSim/StarComModbusSlaveSim.jar	

It is perfectly possible to enable / disable and configure the Netbus Pro Core services on the computer and the explored netbus devices through the Netbus System Manager web site.

#### **10.2. Exploring Netbus Devices through Web Interfaces**

Netbus System Manager web site provides a "Clients" page to explore netbus devices existing on the same network as well as any device on the internet with an accessible IP Address.

l	Netbus System Ma	nager						Config				Clien	ts adm	
	Clients	re												
	clients	IPM	Mask 2	255.255.255.25	55			Rescan	Click to	start rescan		Netbus clie	nts, Nr	Of Items: 1
	IP	Name	Mod	el	Туре		Health	Description						
	192.168.1.24	Netbus-N	lode-OKC	DLAP50-003		Stan	dard	No	de	0	This is the standard	d Netbus Pro N	ode	

### **10.3. Setting and Configuration via Web Interfaces**

The user may access to configure and manage the explored netbus device using the Netbus System Manager web site with a valid username and password. Secure access is provided and only authorized access is allowed to perform management operations.

Netbus System Manager System Applications Users Licences Host Config Virtual Logs	
Host	
This page contains host diagnostics pages. Performence page contains CPU and memory load values and Processes page contains running processes list in the host machine.	
Performance Processes Health	
Performance □ Auto update values	The performance measures of this device is shown here.
CPU-0	
CPU-1	
CPU-2	
29	
CPU-3 27%	
CPU-4	
CPUS	
CPU6	
CPU-7	
Menoy me	Shared ButtCache
Swap	
Free	

#### 10.4. Configuration and Diagnostics Tools via Web Interfaces

Netbus Pro applications consist of several services which implement the tasks and a web site which provides GUI for configuration, management and diagnostics for this particular service. Every service has its own configuration, management and diagnostics pages.

	Link Slaves Values	Connig Logs					admin [Administrator]
	EC104 Link web managen			software provides data-link to l		LO4 devices	s and transfers
E		The following action			Logs	_	TAGS ×
You n     You n     You n			ay Use System configuration editor ay Use System configuration editor ay Use System configuration editor				SName sage configuration file Saw Load Underd, OK.
00010	-3-104	<ul><li>You may Us</li><li>You may Us</li></ul>	tags	Click to generate new item New			SDeviceName Configuration Tags, Nr Of Items: 89
			Actions	sName	sDeviceName	sDescription	SAT1 • Please select the device name from the list
Internal Appli	lications Others A	Actions	Edit	DI_00	SAT1	DI_00	sDescription igft {"enable": "0","tagNo": "2","period": "60","REC": "0" } }
			Edit	DI_01	SAT1	DI_01	DL_00 g": { "enable" : "0","tagNo" : "3","period" : "60","REC" : "0" } }
Action	Function	Explanatio	Edit	DI_02	SAT1	DI_02	bReadOnly     g1": {"enable": "0","tagNo": "4","period": "60","REC": "0" }) Plase choose Read Only option
Start	Start System	You may s	Edit	DI_03	SAT1	DI_03	parameters g": { "enable" : "0", "tagNo" : "5", "period" : "60", "REC" : "0" } }
Stop	Stop System	You may s	Edit	DI_04	SAT1	DI_04	Parameters Edf: g": {"enable": "0";"tagNo": "6";"period": "60";"REC": "0"; }}
Stop	cup bystem	Tou may 3	Edit	DI_05	SAT1	DI_05	Peace enter parameters g": { "enable" : "0", "togNo" : "7", "period" : "60", "REC" : "0" } }
Restart	Restart System	You may re	Edit	AI_V0	SAT1	AJ_V0	Apply         Add         Delete         Undo         Close         g*: { "enable" : "0", "tagNo" : "8", "period" : "60", "REC" : "0" } }
			Edit	AI_V1	SAT1	AI_V1	tags[0] is loaded and ready to make changes g^1 { "enable": "0","tagNo": "9","period": "60","REC": "0" } }
			Edit	AI_V2	SAT1	AI_V2	tags(o) is loaded and ready to make changes
			Edit	AI V3	SAT1	AI V3	faise {'variable': '11', "recording': { "enable': '0', "tagNo": '11', "period": '60', "REC": '0' } }