BLUEPLANT

HMI/SCADA SOFTWARE

THE DEFINITIVE SOLUTION FOR SUPERVISION AND CONTROL

MARKETS

VERSATILE AND OF HIGH PERFORMANCE, BLUEPLANT HAS RESOURCES FOR SUPERVISION, CONTROL AND DATA ACQUISITION IN VARIOUS INDUSTRY SEGMENTS, SUCH AS

OIL & GAS | AUTOMOTIVE | POWER | FOOD & BEVERAGE

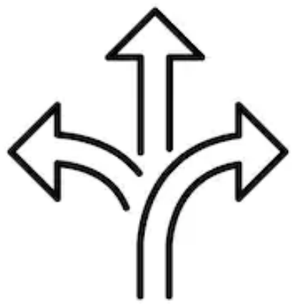
BUILDING | WATER & WASTEWATER | STEEL | SUGAR & ETHANOL

TEXTILE | CHEMICAL | MINING | PHARMACEUTICAL

WHY BLUEPLANT?

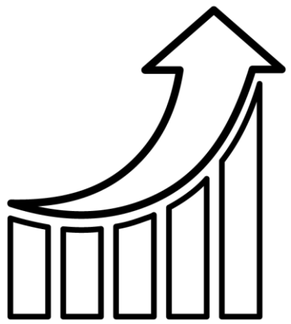
Intuitive

High quality graphics on an environment with intuitive setup and operation



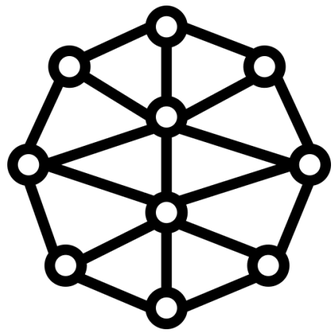
Versatile

Adaptive scalar architecture for applications on various industrial segments



Available

Safety, redundancy and high performance for systems that cannot stop

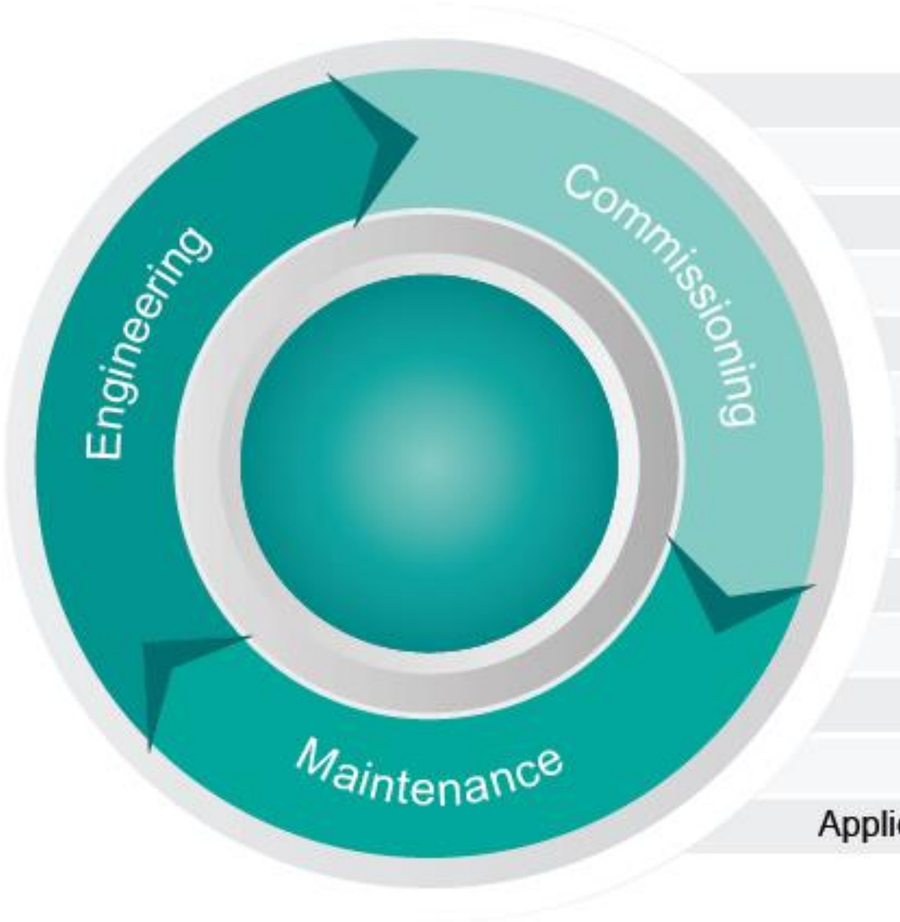


Connective

Support for the main communication drivers used in the industrial market

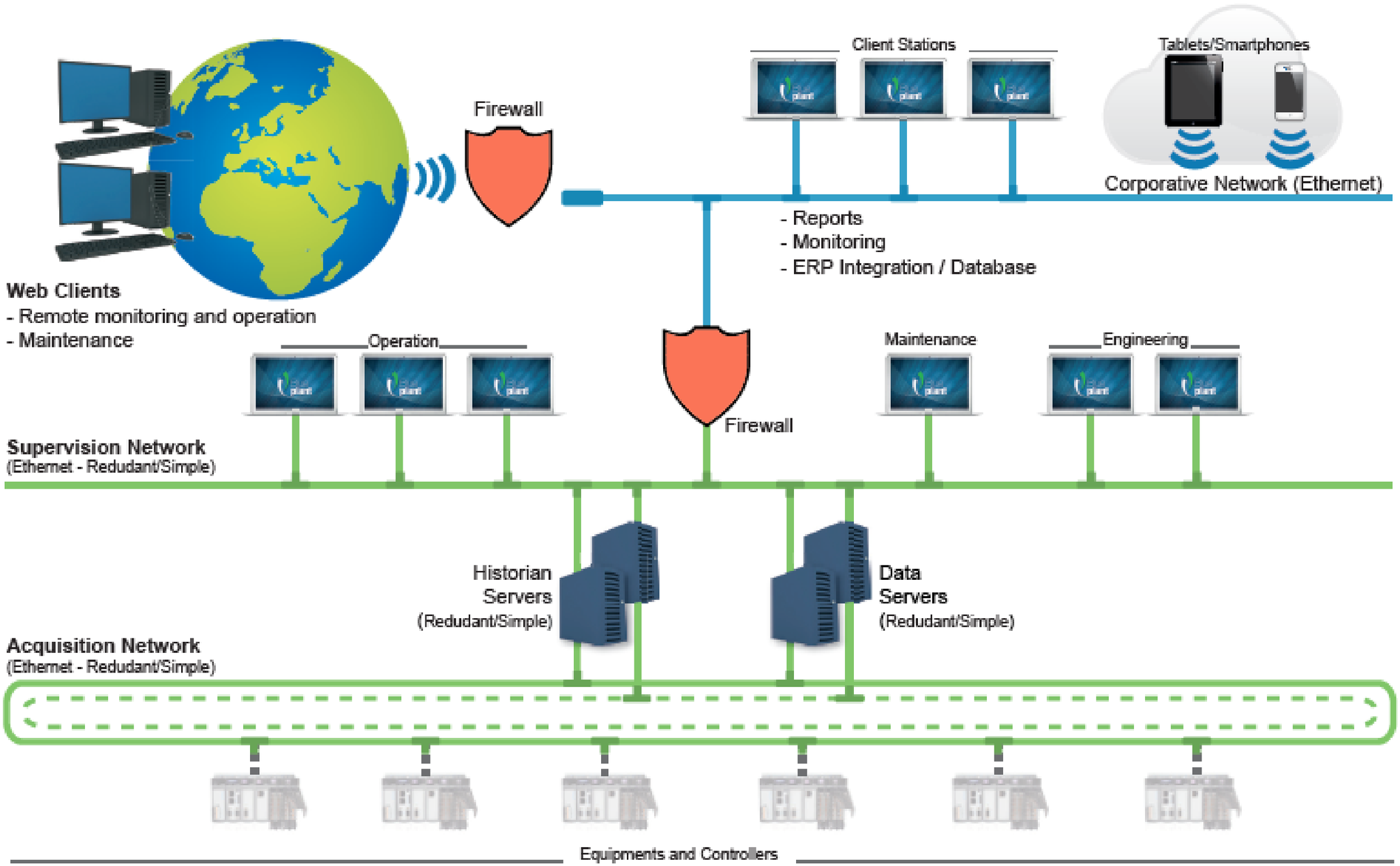
MAIN FEATURES

- Regardless of the stage of the application, BluePlant has functionalities and features that aim **productivity**, **safety** and **performance**



	Engineering	Commissioning	Maintenance
Supports C# and VB.NET Scripts	● ● ●	● ○ ○	● ○ ○
Distributed and Remote Engineering	● ● ●	● ● ○	● ● ●
Symbols Library	● ● ●	● ○ ○	● ○ ○
Graphical XAML Support and 3D Models	● ● ●	● ○ ○	● ○ ○
Multiple Integrated Communication Drivers	● ● ●	● ○ ○	● ○ ○
Project Comparison	● ○ ○	● ● ○	● ● ●
Simulation	● ● ●	● ● ○	● ○ ○
System Diagnostics	● ○ ○	● ● ○	● ● ●
Project Cross References	● ○ ○	● ● ●	● ● ○
Debugging and Controlling Panels	● ○ ○	● ● ○	● ● ●
Report Editor	● ● ●	● ○ ○	● ○ ○
User Management and Access Rights	● ○ ○	● ● ●	● ● ●
Applications Changes Without Stopping The System	● ○ ○	● ● ○	● ● ●

ARCHITECTURE



GENERAL FEATURES

GENERAL FEATURES

INTRINSICALLY SAFE SOTWARE

- The Intrinsic Safety feature provides safety and reliability to the product
- There is no use of C or C++ in the development of the platform, which completely eliminates the risk of problems with pointers and/or memory exceptions
- Each execution task and process, whether internal or created to be performed within the scope of BluePlant, is performed in its own allocated space and protected with:
  - Internal exception control
  - Memory isolation
  - Multitask control
  - Real-time synchronization

GENERAL FEATURES

SUPERIOR GRAPHIC MECHANISM

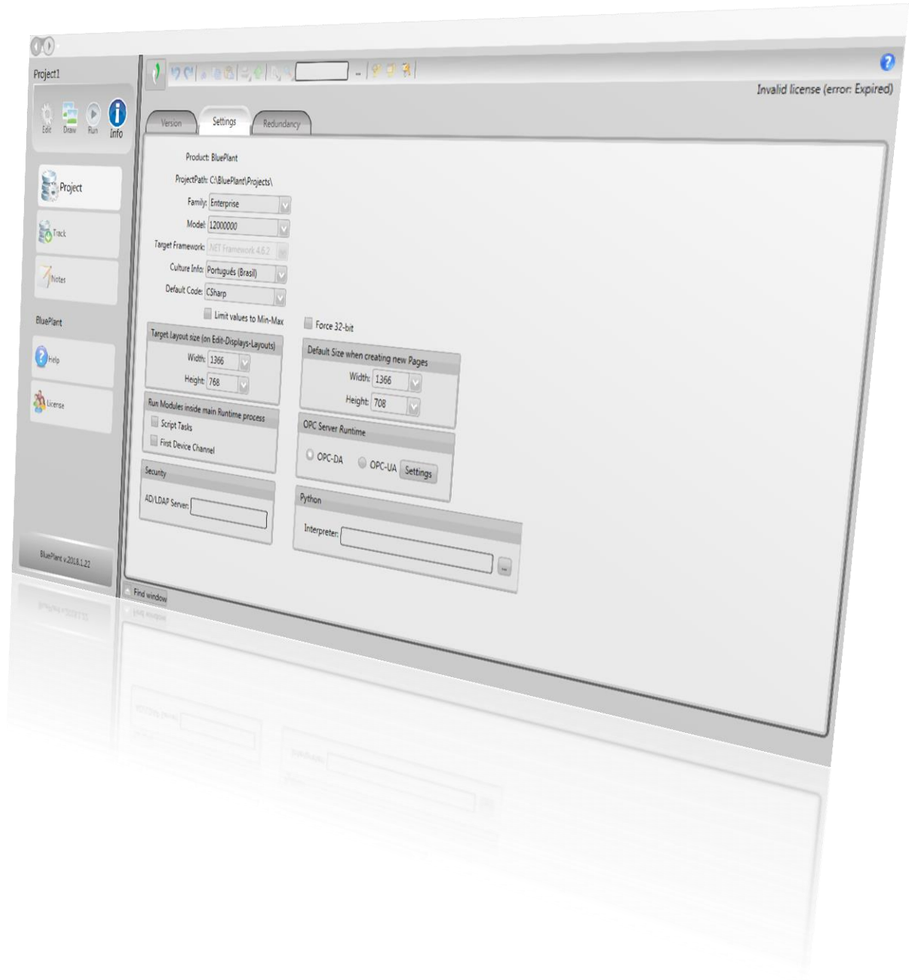
- BluePlant’s graphics are from Windows Presentation Foundation (WPF), with an internal system which uses XAML
- Integration with geospatial maps and 3D models
- 3D models can be displayed directly, as well as linked to dynamic data with associated responses and behaviors based on real-time events and values
- A powerful WPF graphic editor is included in BluePlant
- Web Clients can develop screens in HTML5, with multiplatform access (Windows, Android, iOS, etc.)

GENERAL FEATURES

MAINTENANCE, TEST AND ADVANCED DIAGNOSTICS RESOURCES

- The system allows the change of project versions, so that applications in test mode are executed side by side, in the same server, with the applications in production mode

- Built-in hot-standby options for redundancy, alternative operation places and disaster recovery are included



GENERAL FEATURES

BUILT-IN SERVERS AND .NET EXTENSIONS

- Complete access to the Microsoft .NET Framework, allowing advanced customization and extensibility without the need for any kind of third-party applications or external tools

- 100% managed code, which allows the use of the full potential of Microsoft .NET Framework

- Setup interface created entirely from Microsoft Windows Presentation Foundation Graphics (WPF), and fully supports Software as a Service (SaaS)

GENERAL FEATURES

MODULAR ARCHITECTURE AND HIGH AVAILABILITY

- BluePlant's redundant servers system allows two distinct computers to execute an application in hot-standby topology simultaneously

- All redundancy setup is automatic in the application itself

- On this topology, if a hardware error occurs, the server in standby takes over control automatically, without system stops or data loss

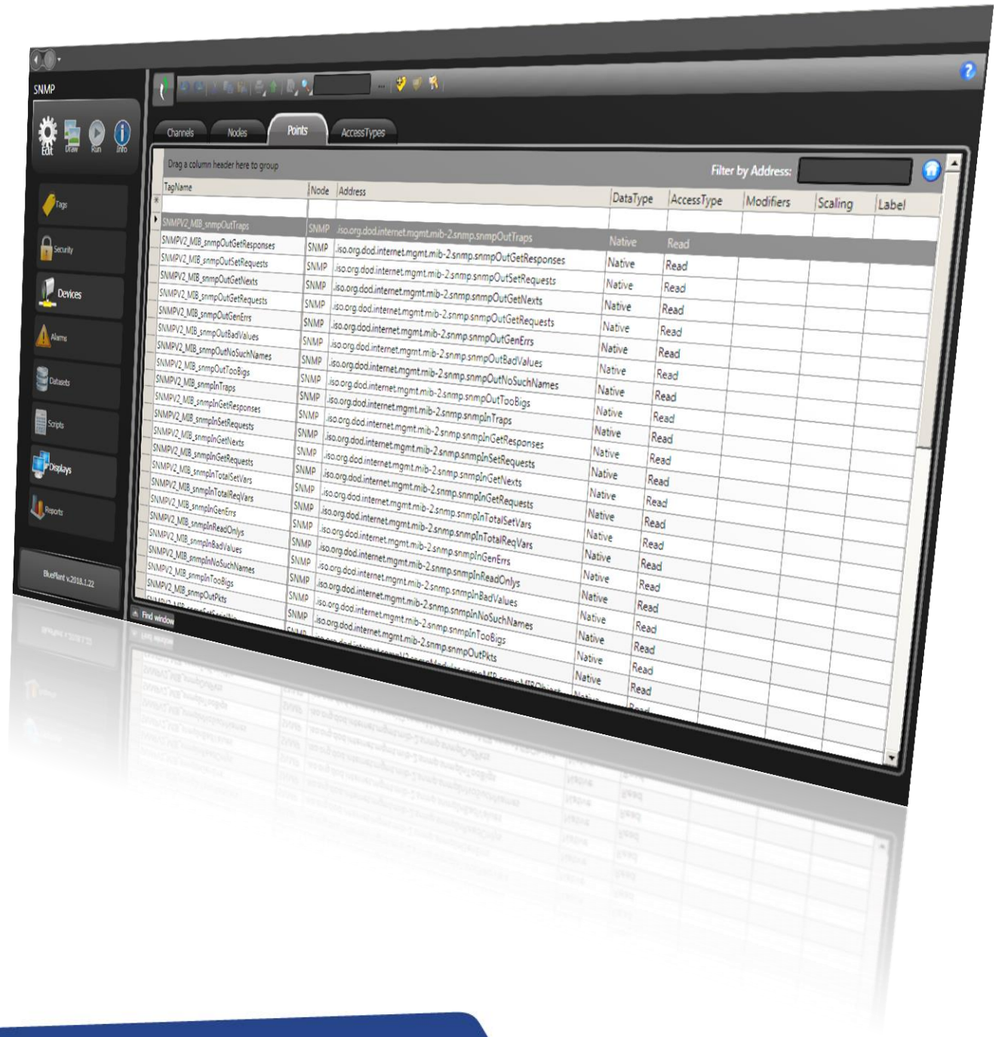
GENERAL FEATURES

ECONOMY AND AGILITY FOR PROJECT COMMISSIONING

- Control panels dedicated for problem analysis and verification, and performance optimization

- Through user panels, it's possible to check time spans and processing consumption of drivers, modules and other components which are being used

- Greater diagnostics precision and investment reduction in engineering hours for the commissioning and debugging of the acquisition and supervision system in automation and process control projects



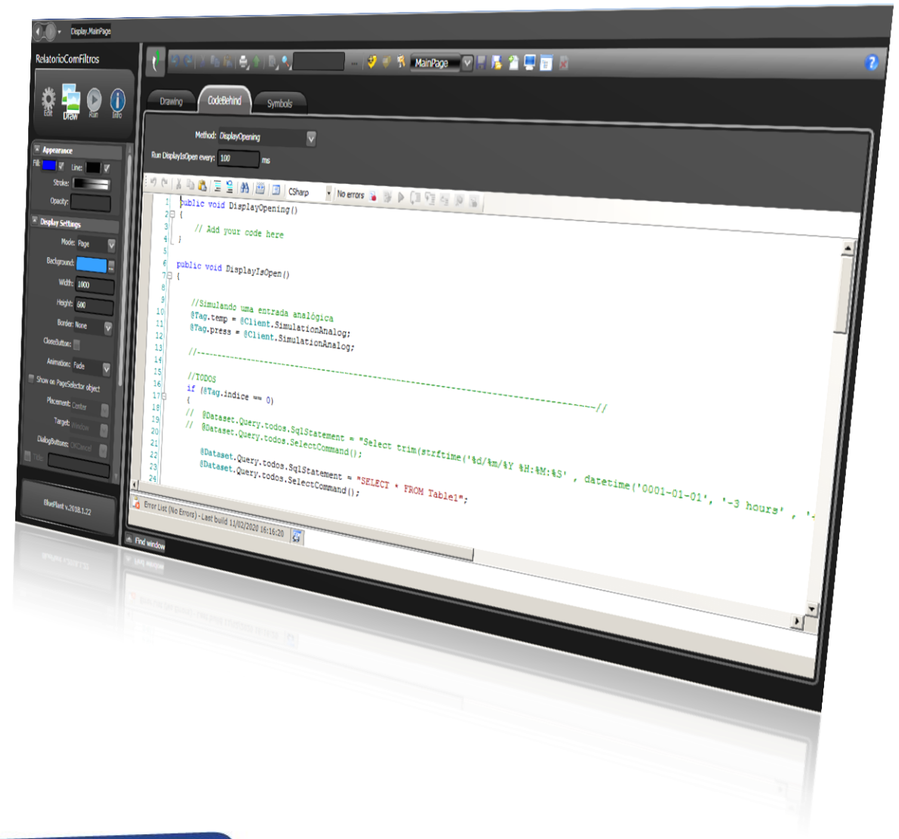
INNOVATIVE FEATURES

INNOVATIVE FEATURES

REAL-TIME DATABASE

- The Real-time database ensures, without the need of any additional programming, the data synchronization of several processes in the server and multiple client stations

Real-time database (Tags)	
Extended support for tag types	Digital, Integer Analog, Double Analog, Decimal Analog, Text, Timer, Counter, Date/Time (date and time variables)
Built-in data table tag	Access to the results of the dataset query on the .NET standard data table object
Reference tags	Use of reference tags to switch the tag link when executing the Runtime
Matrix type tag	Matrix type tags definition (one to three dimensions, depending on the product version)
Types and structures defined by the user	Definition of own types for the Real-time database
Tag properties	Wide set of tag properties accessible in the Runtime setup

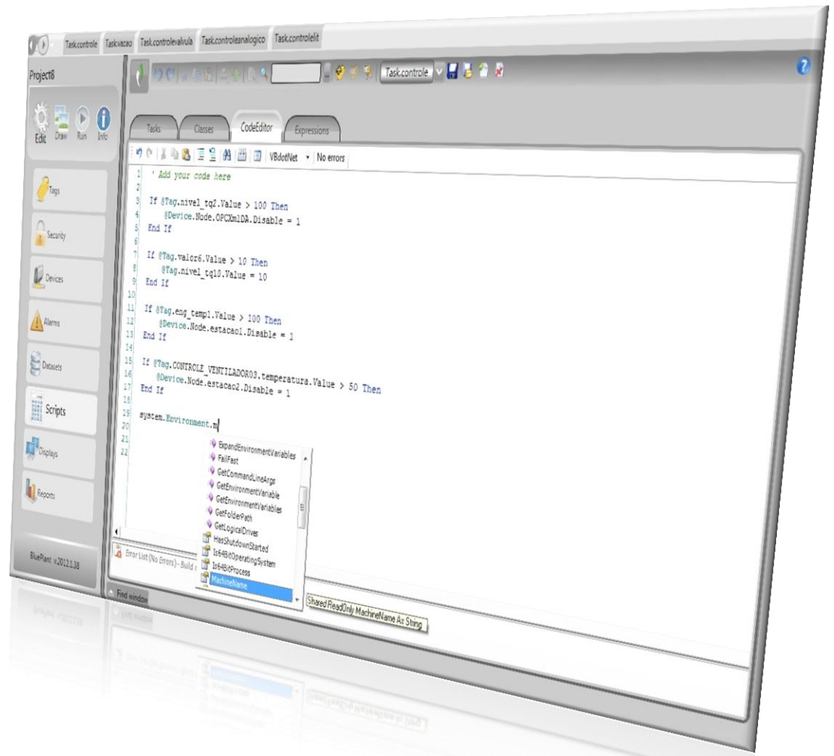


INNOVATIVE FEATURES

.NET LANGUAGES AND SCRIPTS

- BluePlant supports Microsoft .NET languages in full integration with the Microsoft .NET Framework. The project's scripts and logics can be coded in C# or VB.NET, and a built-in language converter allows the dynamic change of code created between languages

.NET Languages and Scripts	
Creation of VB.NET functions and procedures	Access objects in BluePlant directly from the code
Execution of scripts in events and programming	Easy connection with tags and events from the process using scripts
Debugging in scripts	Scripts have the debugging resource for breakpoints insertion
Support for class libraries	Creation of classes accessible to other scripts and screens
Integrated .NET editor with Intellisense	Assist in the selection of tag names and object properties
Support for exceptions and tracking messages	All of the .NET Framework, external components and services are easily integrated

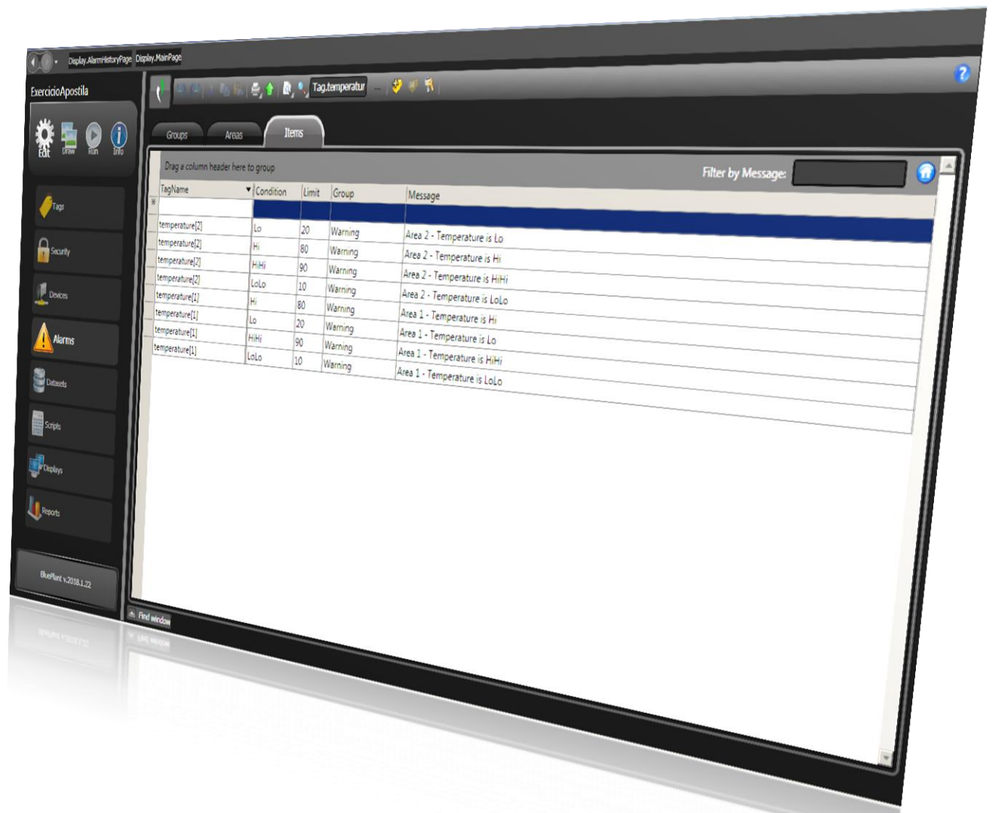


INNOVATIVE FEATURES

ALARMS AND SECURITY

- It's possible to set various levels of alarms for each point or tag and a whole range of behaviors, such as registry, recognition, display, etc. The security system can define access levels for each screen object. Alarm and security conditions are automatically replicated in redundant applications

Alarms and Security	
Multiple alarm conditions	Hi, HiHi, Lo, LoLo, change rate e deviation
High resolution	Time stamp interval in milliseconds (when available), using the remote I/O time, not the time of the computer
Built-in view objects	Online graphic object and history, when executed locally or on Web
Alarm group and objects item	Access the alarms' properties directly, E.g.: "total alarms active", without the need for creating tags in the application



INNOVATIVE FEATURES

TENDENCY AND HISTORIANS

- BluePlant allows the creation of historian files in external databases, such as Microsoft SQL Server or Oracle, or even use the built-in SQL database

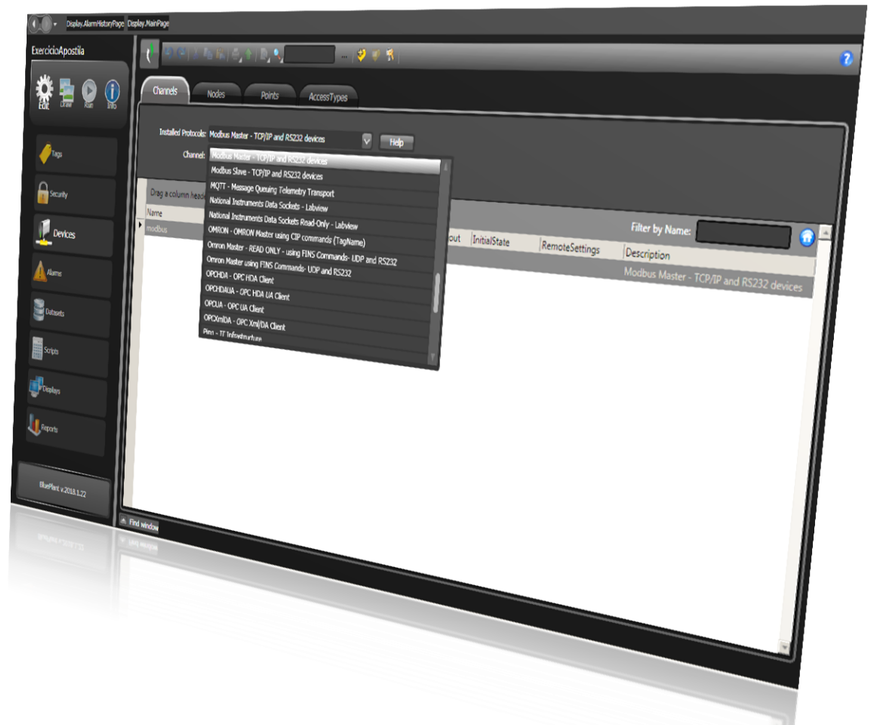
Trend and Historians	
Connection to ADO database	Historian information can be saved to any external database with support to ADO.NET
Built-in SQL database	When not defined as an external database, the log is made in the built-in SQL database
High resolution	Time stamp interval in milliseconds (when available), using the remote I/O time, not the computer time
Trigger by tag or group	Allow the saving of a registry according to the tag change or based on process events
Dead band of the historian by tag	Allow the definition of a minimal tag variation for the registry trigger
Setup of the minimum time interval	Allow the definition of a minimum recording interval, allowing the creation of more compact databases
Database tables with multiple tags	Allow the creation of a tag group and store it on the same data table to speed up the recording and loading
Built-in trend view object	Historical and online graphic object executed locally or on the Web

INNOVATIVE FEATURES

DEVICES AND NETWORKS

- BluePlant is supplied with and OPC DA driver for the collection of information from remote devices, and also provides support for custom communication drivers to directly access PLCs, remote I/O systems, standard field buses, multiple and single loops, scanners, bar code scanners, RFID devices and digital displays

Devices and Networks	
Importing of data points settings	Copy and paste from Microsoft Excel, import databases from CSV or OPC servers
Communication executed in an isolated process	Total protection for the Runtime environment and advanced performance in multi-core processors
Easy communication with several channels	Automatically create multiple tasks on multi-serial or TCP/IP protocols
Abstract appointment for nodes and stations	Provides an easy way to rename and maintain the IP Address and the I/O network settings
Dynamic creation of optimized blocks	Simple selection of read/write points, based on the protocol, and creation of optimized blocks
Points setup follows the device's syntax	Address device points; this addressing is used in the PLC's programming tools
Channels and nodes' properties	Access the properties directly, E.g.: node status and application tags are not required
Writing events customization	Easy setup for commands and events, written from all events or only on the occurrence of a value change

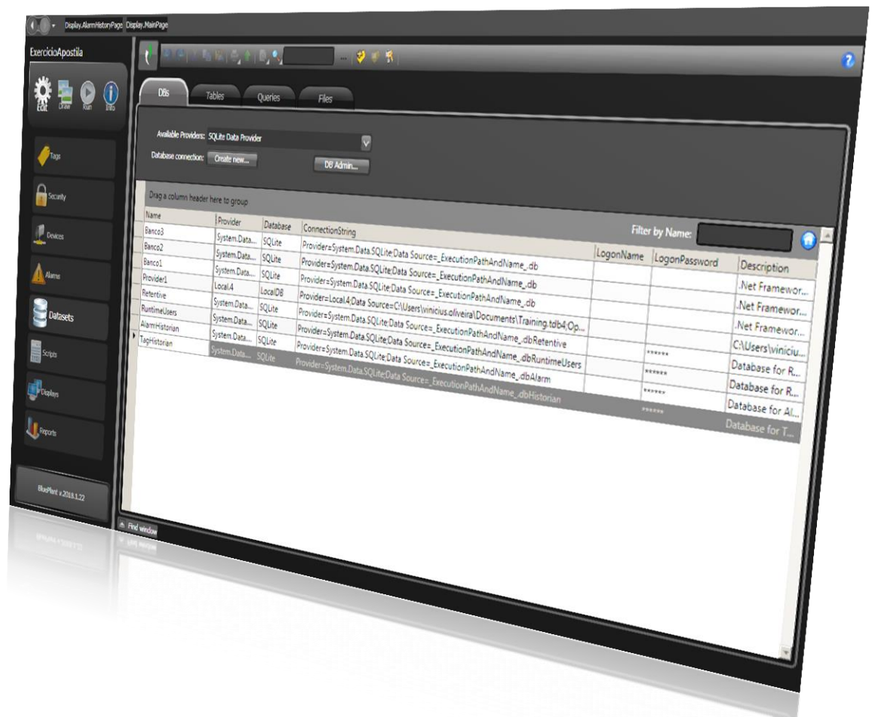


INNOVATIVE FEATURES

DATASET

- BluePlant's dataset module offers an easy-to-use interface for a real-time information exchange with external databases, XML, CSV or text files, as well as allows access to tables and SQL queries.

DATASET	
Access texts, CSV and XML files	Define the real-time link with tags and file content
Definition of multiple database sources	Easily manage multiple database connections
Tags mapping with data tables	High level setup tool to manage database tables used in the project
Definition of queries and mappings	Manage several queries triggered by process events and filter conditions using data points in real-time
Powerful data grid visualization object	Wide and powerful data grid object to create local user interfaces as well as on the Web
Table and query properties	Access properties (for example, line counting) directly, without the need for tags creation in the application

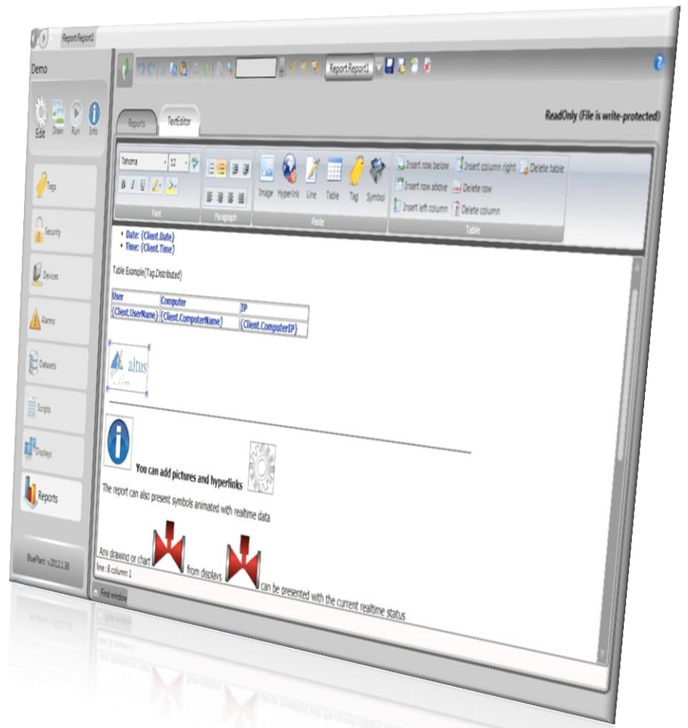


INNOVATIVE FEATURES

REPORTS

- BluePlant offers support for Web services, XML and other data exchange interfaces aiming to supply data to external report tools. In contrast with other packages, where reports are necessarily created in another tool, BluePlant has is its own internal report editor.

Reports	
Built-in editor	Easy-to-use text editor, allowing the inclusion of tables, images, hyperlinks and text formatting
Support for text, HTML and XPS	Save reports to various formats, such as XPS, allowing an easy implantation in distributed environments
Copy and paste	Edit on Microsoft Word, on an HTML editor, or RTF, just by copying and pasting the content from BluePlant
Real-time tags easily inserted	With just one click, the user can add data values in real-time to reports



INNOVATIVE FEATURES

CLIENT SCREENS

- BluePlant's built-in graphic editor uses the Microsoft's WPF technology to allow the creation of full user intefaces with real-time mapping of values and tags from the process: a powerful and complete set of dynamic animations is also included

Remote Clients	
BluePlant Visualizer Client	Executed as a desktop application, it allows to block the switching of Windows tasks (CTRL+ALT+DEL and ALT+TAB keys). Ideal for intranet operators/user s with security demands
Web Smart Client	Uses Microsoft's .NET Smart Client technology. It's possible to install it on remote clients with a single click, without admin permission. The application is automatically updated on remote clients when updated on the server. BluePlant uses all the remote computer's potential while still maintaing the advantages of a centralized installation
Web HTML5 Client	The client screens can be executed directly from Web browsers, without the need for installing any software, and count on multiplatform access (Windows, Android, iOS, etc.)

INNOVATIVE FEATURES

RUNTIME OBJECTS

- BluePlant allows applications to directly access the Runtime objects created in the project, without the need for creating tags or variables for all internal properties and customize logics for the projects

- Temporary tags are not necessary to manage the nodes' status from the PLC's network, the total alarm number in a group or the number of lines in a dataset

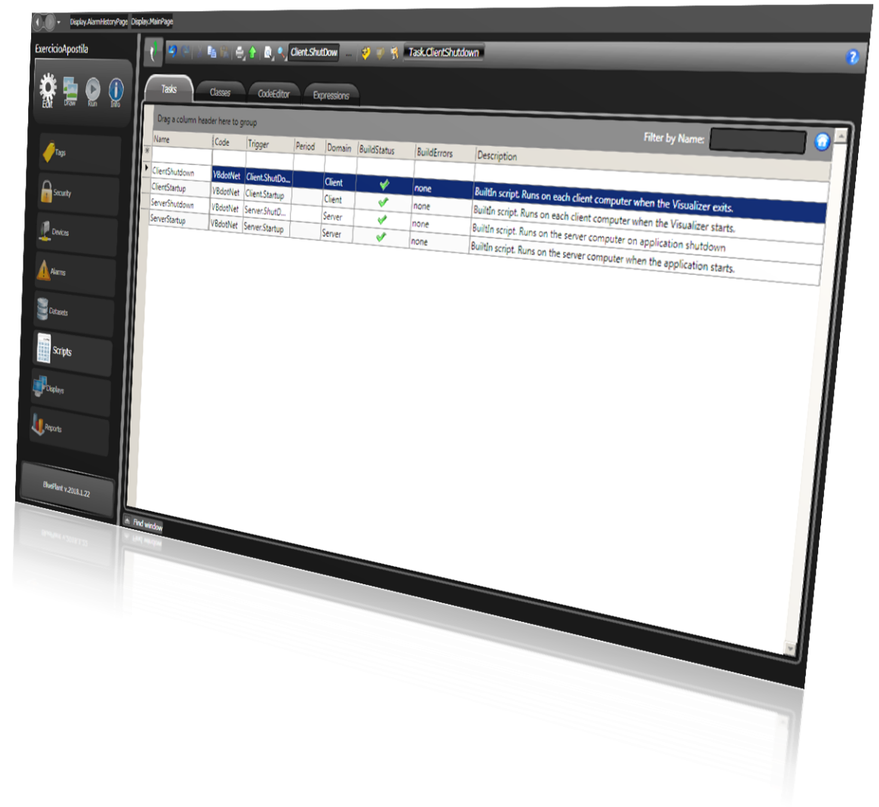
- It is possible to access the Runtime objects (which represent a node in the network), an alarm group or dataset and display the necessary information or take an action directly through the integrated properties.

INNOVATIVE FEATURES

MODULE ISOLATION

- For greater performance, security and reliability, the CPU modules with greater consumption and sensitivity, such as scripts, datasets, devices (communication drivers), reports and screens, are executed in their own processes or in the application domain in their own task, independently of the server's real-time database

- The BluePlant architecture also allows for the distribution of application data acquisition, or any CPU intensive application on different computers in a distributed environment, providing greater flexibility to implement various redundant scenarios and consequent simplification of field maintenance.



INNOVATIVE FEATURES

RUNTIME TOOLS AND DIAGNOSTICS

- The **property monitoring** tool allows for checking and simulating values on all modules and objects, as well as run and stop all modules individually.
- The **window tracking** tool automatically generates system messages about important events in the Runtime and can be easily extended to issue specific messages related to script events, tags/points data changes or user actions.
- The **module information** tool is a performance and advanced profile tool which provides internal information of all of the Runtime environment

Diagnostics and Runtime Tools	
Test mode	Run projects with protection, as "read only" on external devices or temporary files in the historian
Module information	Advanced tools for performance profile and internal systems diagnostics
Locating tool	Create operator's user interface in various languages and dynamically swtich between them in Runtime
Tracking window	By creating an application, this tool provides tag monitoring and system's diagnostics messages
Property monitoring	Check and simulate tag values and properties, run and stop functional modules

INNOVATIVE FEATURES

PROJECT IMPLEMENTATION AND TEST

- Before running an application or a project, it's possible to use BluePlant's exclusive "test mode", in which a project or application is run in a safe test environment.

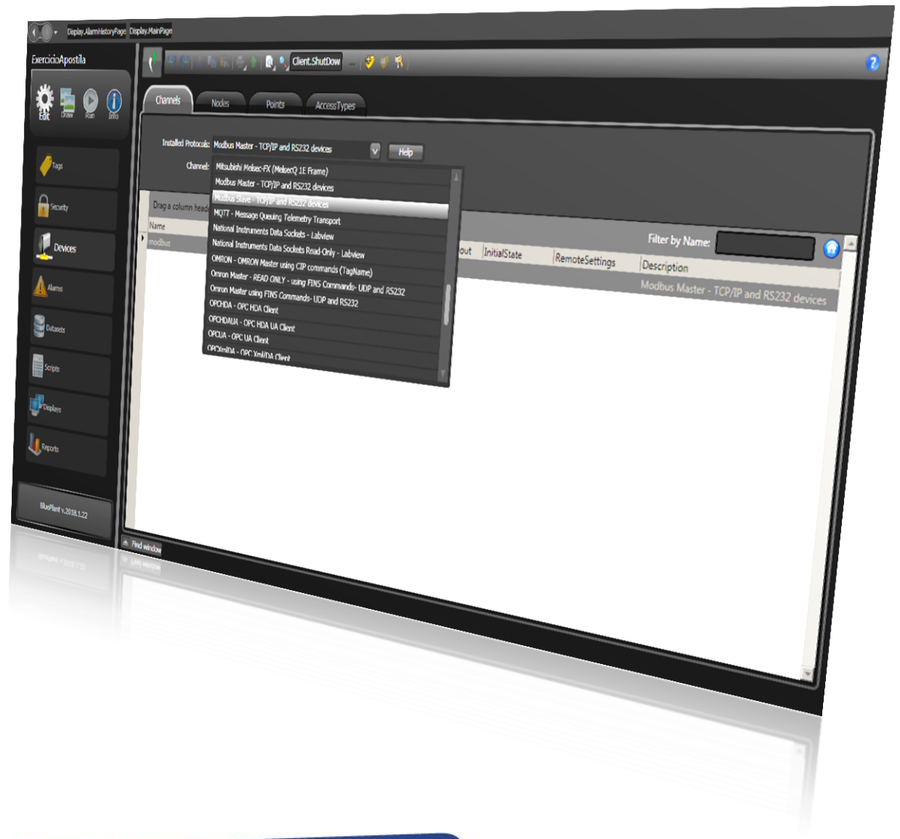
Project Implementation and Test Tools	
Opening of several projects	Simultaneously open several projects in the computer
Remote engineering	Remotely access and edit the project's settings
Execution as a Windows service	Execute the Runtime on the server, installed as a Windows service
Applications switching protection	Protection against unnauthorized application switching in operator interfaces using Windows CTRL+ALT+DEL keys or others
Startup shortcuts	Use simple startup shortcus and parameters for startup customization
Single file project and embedded resources	The setup of all the project is saved to a single protected file, including all images and bitmaps used in screens and reports

INNOVATIVE FEATURES

COMMUNICATION DRIVERS

- Several communication drivers are available for the main PLC manufacturers and automation systems.

Communication Drivers	
MODBUS	RTU-TCP RTU-TCP Slave
OPC	OPC UA Client OPC DA
SNMP	SNMP Manager
DNP3	DNP3 Master TCP (on request) DNP3 Master Serial (on request)
IEC 61850	MMS Client (on request)
IEC 60870-5-104	IEC 60870–5–104 Slave TCP (on request)



MODELS

MODELS

- BluePlant is offered in 4 different models, so the best solution can be chosen according to the needs

Enterprise

- Process Plants Management
- Business Intelligence – BI
- Real-time panels
- SCADA
- Advanced HMI
- Processes Control
- Optimization
- Clients
- Distributed Data Acquisition
- Applications starting from 150 communication points

Lite

- Panels
- Industrial Computers
- Embedded Devices
- Autonomous Systems
- Mainly applied in machine interfaces and small centralized projects
- Applications from 150 to 1500 communication points

Student

- Designed for schools and universities
- 1500 communication points
- Limited to 1 hour of Runtime execution

Express

- Evaluation version (not for field application)
- 75 communication points
- Limited to 1 hour of execution Runtime

MODELS

COMPARISON

- **Quantity of Communication Points by model:**

BluePlant Enterprise	BluePlant Lite	BluePlant Express	BluePlant Student
-	-	75	-
150	150	-	-
300	300	-	-
500	500	-	-
1,500	1,500	-	1,500
2,500	-	-	-
5,000	-	-	-
15,000	-	-	-
25,000	-	-	-
50,000	-	-	-
100,000	-	-	-
Ultimate	-	-	-

Note: applications with over 100,000 tags must use the Ultimate license

MODELS

COMPARISON

- **Features comparison of BluePlant's models:**

Features	BluePlant Lite	BluePlant Student	BluePlant Express	BluePlant Enterprise
Illimited runtime execution	Yes	No	No	Yes
OPC DA Server	Yes	Yes	No	Yes
C# Language	No	Yes	Yes	Yes
Multithreading execution of scripts	No	No	No	Yes
Tags matrix (multiple dimensions)	No	No	No	Yes
User types (multiple levels)	No	No	No	Yes
SDK extension and toolkits integration	No	No	No	Yes
Concurrent remote Rich Clients	No	Yes	Yes	Yes
Device nodes redundancy	No	Yes	Yes	Yes

MODELS

COMPARISON

- **Features comparison of BluePlant's models:**

Features	BluePlant Lite	BluePlant Student	BluePlant Express	BluePlant Enterprise
Servers redundancy	No	No	No	Yes
Reports through graphic objects	No	Yes	Yes	Yes
Extended conditions of alarms	No	Yes	Yes	Yes
Project Version control	No	Yes	Yes	Yes
Change control by objects	No	Yes	Yes	Yes
Automatic compression of history	No	No	No	Yes
WPF access control	No	Yes	Yes	Yes
Hot start	No	No	No	Yes
Test mode	No	Yes	Yes	Yes

MODELS

FEATURES IN COMMON

- **Features in common for all BluePlant versions:**

- OPC client
- Multiple project opening
- VisualBasic .NET language
- Scripts for evaluation of mathematical expressions
- Scripts for creating .NET classes and tasks
- Integration with SQL databases
- Historian and Logger
- Alarm and Protection
- Concurrent remote Web clients
- WPF graphic editor
- Engineering and debugging tools
- Report editor
- Change control by tables
- Localization
- Simultaneous protocols
  - All BluePlant models have at least 4 channels

COMPARISON WITH TECHNOLOGIES FROM THE MARKET

HIGHLIGHTS

TECHNOLOGY

Criteria	BluePlant	Market	BluePlant's Advantages
Internal Programming	C# or Java	C/C++	Protected memory management and more advanced framework
Graphic Technology	WPF and XAML	GDI / pixel	Independent of resolution (vector) and uses hardware acceleration
Scripts	VB .NET and C#	VBScript, VBA or proprietary	More settings checks Performance up to 20 times superior Errors in scripts would cause the system to become unavailable Errors would show up on Runtime, without warnings during engineering
Native Platforms	32 and 64 bits	32 bits	Better use of hardware and greater compatibility
Functional Modules and Drivers	Multithread distributed processes	Modules without isolation and monothread script	Isolation of drivers and modules protects each function and makes better use of multicore CPUs
Web Client	Partial Trust	Active-X	More secutiry

HIGHLIGHTS

SETUP AND ENGINEERING

Criteria	BluePlant	Legacy Technologies
Edition and Execution of Projects	Multiuser, with edition and execution of several simultaneous projects	Monouser and monoproject
Remote Access of Engineering	Native, multiuser and multiproject, with support for VPN environments and cloud computing	Use only on VPN through external utilities. Normally monouser
Object Orientation, Intellisense	Easiness in the project development, minimizing engineering hours	Difficulty in the development with limited resources, difficulting the productivity
Traceability of settings and version control	Client-server architecture, centered in SQL databases, with native traceability of settings and project versions	Localized architecture and proprietary settings files. Traceability run manually or through external programs
Settings validation	Extensive validation during setup	Setup validation depended on running the system

HIGHLIGHTS

INSTALLATION AND PRE-OPERATION

Criteria	BluePlant	Legacy Technologies
Test and Publishing Tools	Assurance of full operation in the application with version control	Need for running the application for validation Version control of the project performed by the engineer
Remote and Distributed Access, including the Project Setup	Native, multiuser and multiproject, with support for VPN environments and cloud computing	Use only on VPN through external utilities Normally monouser
Setup and Integration more automated with PLCs and Native SQL Databases	Client-server Architecture, centered in SQL databases, with native traceability of settings and project versions	Binary databases, with low performance Need for installing complementary tools
Project in a single protected file	Better control and protection of the project	Hundreds of independent files Difficulty in the control and protection of the project

HIGHLIGHTS

OPERATION, MAINTENANCE AND EVOLUTION

Criteria	BluePlant	Legacy Technologies
Native and Full Redundancy	Redundancy integrated in the product	Need for setup and generation of scripts to function
Remote Online Setup and Hot-Swap	Online setup, remotely, with hot-swap capacity for project versions	Need for stopping the operation to perform the swap of full projects
Setup and Integration More Automated with the PLCs and Native SQL Databases	Client-server architecure, centered in SQL databases, with native traceability of settings and project versions	Binary databases, with low performance Need for installing complementary tools
Project in a Single Protected File	Better control and project protection	Hundreds of independent files Difficulty in the control and protection of projects

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