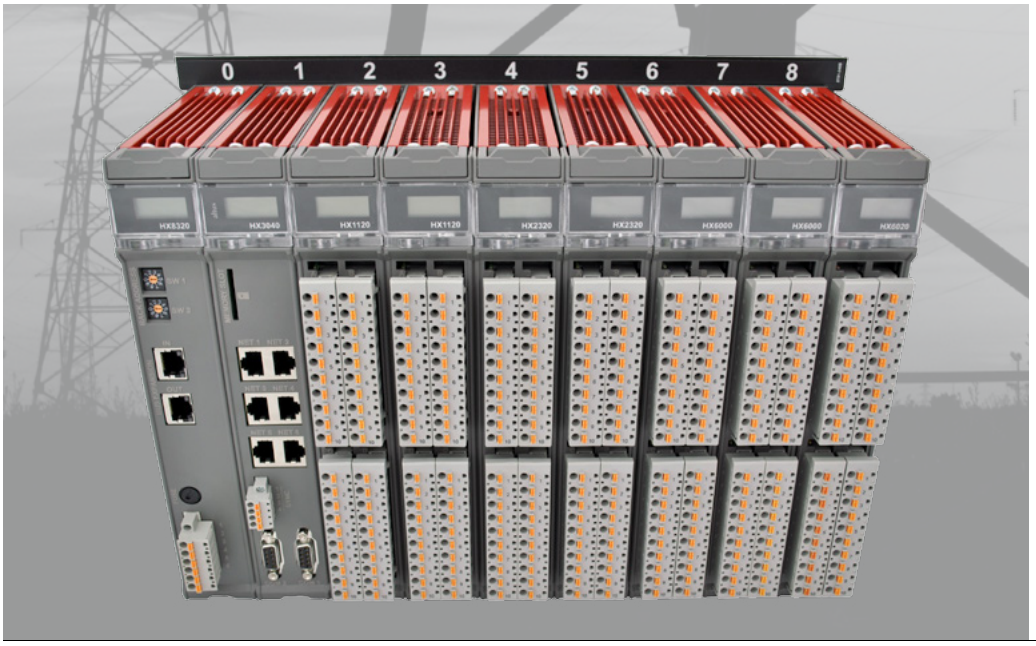
Hadron Xtorm Series

Remote Terminal Units



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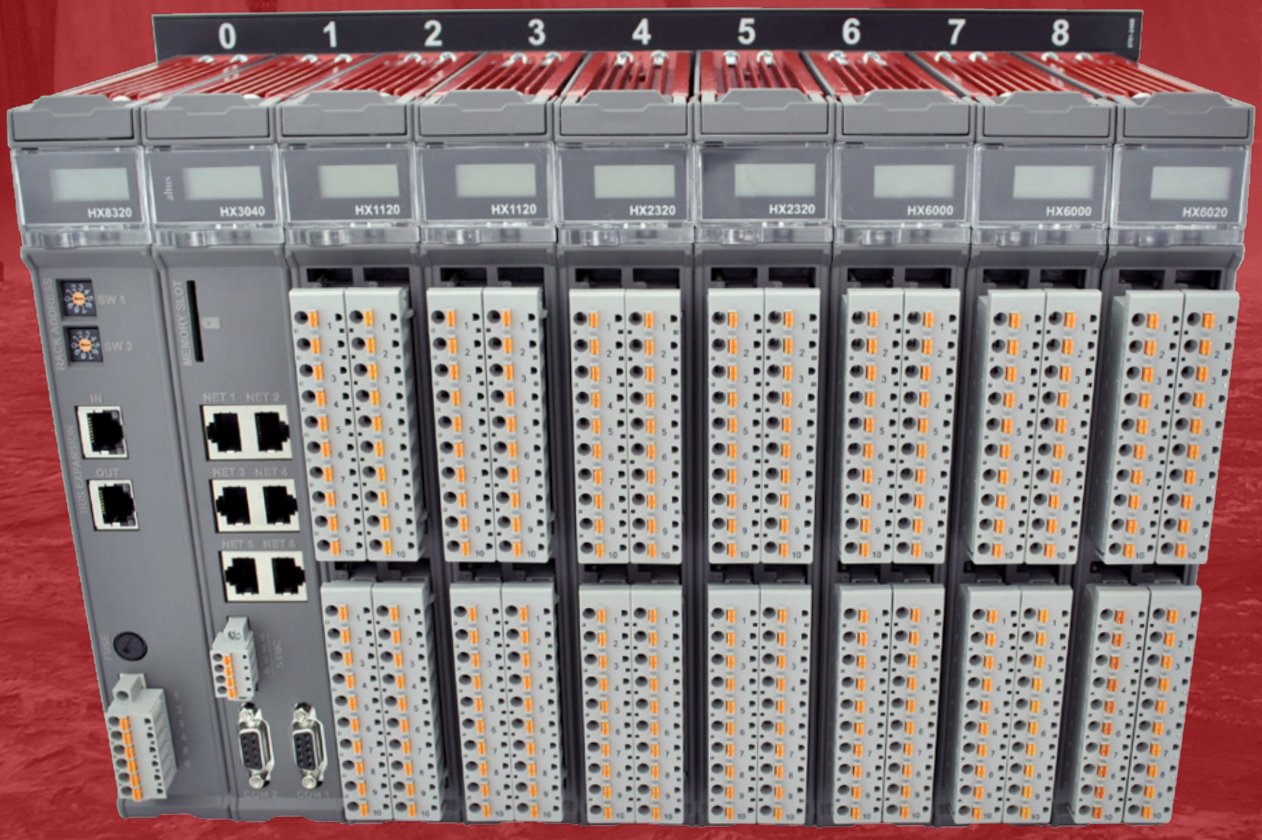
Overcoming your challenges

Fast: superior processing speed and high performance protocols
Rugged: rugged design for operation in critical environments
Reliable: : redundancy and special input and output modules



“ Ruggedness, reliability, high performance and connectivity: ideal features for the challenges in power applications.

The right choice for power applications

Altus has the solution for Power Generation, Transmission and Distribution: the Hadron Xtorm. This Remote Terminal Unit (RTU) Series was designed based on international standards such as the IEC 61850 and IEC 61131-3, promoting a revolutionary innovation in applications of this segment.

Hadron Xtorm is the result of the consolidated Hadron Series, an Altus product that has been present in the market for several years, where it has developed a large installed base and a diversity of applications. This product offers outstanding features such as redundant power supplies and redundant CPUs in the same rack. It also has native protocols such as DNP3 and IEC 61850 (MMS and GOOSE), and meets telesupervision requirements by grouping digital protection events.

The modular architecture of Hadron Xtorm provides a wide variety of input and output modules, which combined with a powerful 32-bit CPU and a bus based on deterministic high-speed Ethernet, meet the requirements for many applications.

Fast

Architecture Excellence

Hadron Xtorm Series was designed to overcome challenges in power applications. The product features high performance, availability and connectivity, without losing focus on the visibility and fast field operation, such as, installation, commissioning and maintenance.

The Series' CPU is based on high-speed data processing and communication by a 32-bit PowerPC in order to meet the requirements of the latest and modern protocols used in these applications. There is also high memory capacity for application storage, reviews, source code and other important files, such as PDFs, images, and more.

With a modern deterministic bus based on Ethernet, Hadron Xtorm Series architecture has high data transfer rates, allowing the update of large amounts of input and output points in a short period of time. Furthermore, new embedded technologies allow the performance of time critical applications.

Resources for High Speed Applications

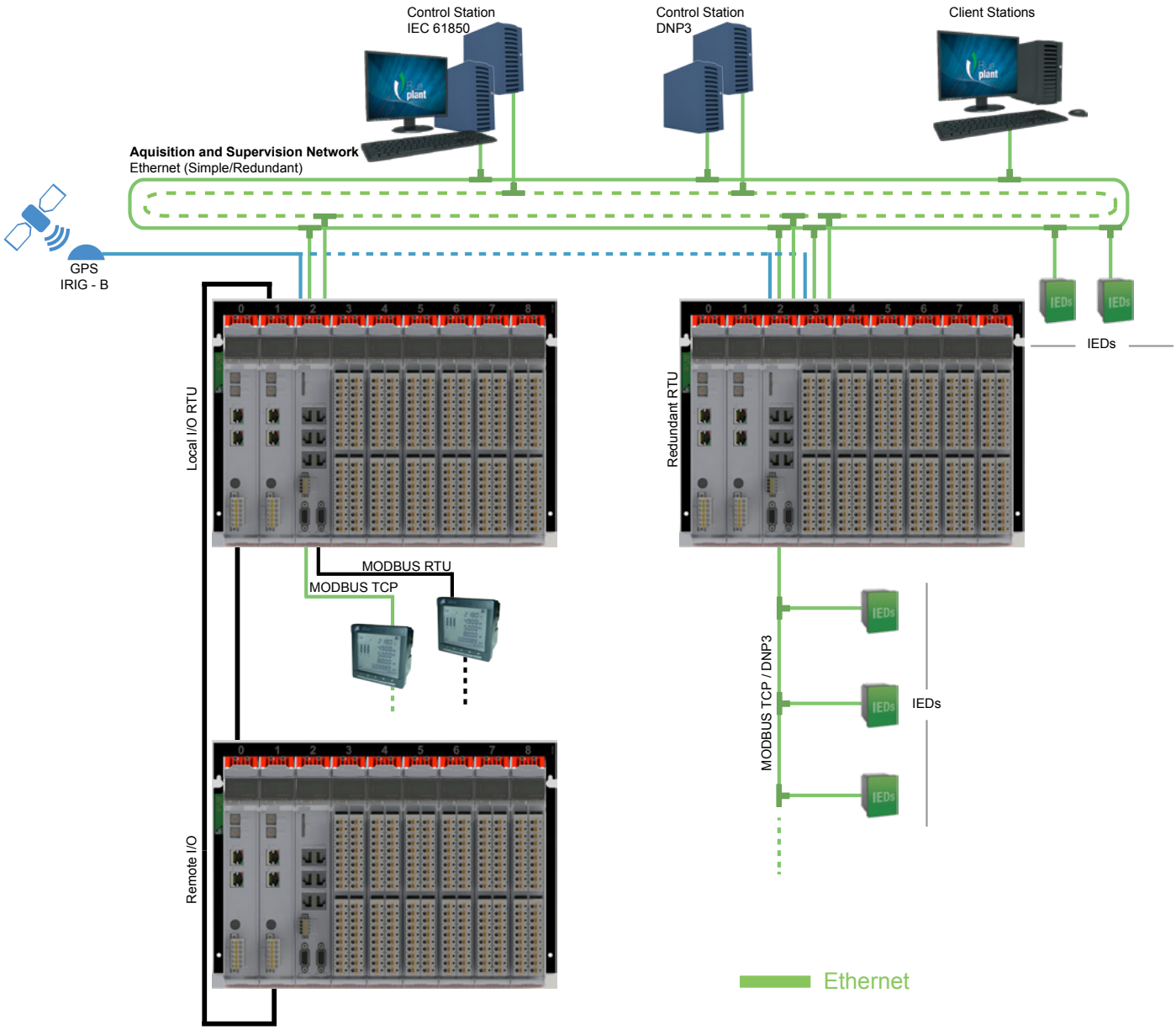
The CPU has several integrated features, such as online programming, high memory capacity and two serial channels. Six Ethernet ports are available for programming and use for IEC 61850, DNP3, IEC 60870-5-104, OPC DA and MODBUS TCP networks. An embedded web server is available for diagnostics. A memory card slot for the application source code storage and program update integrates the capabilities of the CPU.

Versatility in Applications

The Series has a versatile architecture allowing the development of appropriate application regardless of their size. With the option of remote and distributed I/O points, the product supports up to 8 racks allowing a single CPU to control 64 I/O modules. Hence, in the product's maximum application capacity, it is able to hold up to 2048 inputs.

The Series is fully compatible with web services featuring:

- Web pages server for diagnostics and product update
- SNTP for clock synchronization
- SNMP for Ethernet TCP/IP network support and management



Rugged

Designed for Hostile Environments

Hadron Xtorm Series design is extremely rugged, allowing its use in applications with harsh environments. Designed for greater durability, the device can be installed in rooms with mechanical vibration and extended operating temperatures. The Series is qualified for applications in power plants, powerhouses and near large electrical devices. Finally, it has high immunity against electromagnetic noise and electrostatic discharges commonly present in these applications. Its design offers these possibilities without compromising the installation and maintenance procedures.

Practical and High Density

Hadron Xtorm Series has a broad line of I/O and special modules. Its high points density and graphical display allow the user to check the status of each point and its diagnostics. This information can be accessed by the CPU, network protocols or the MasterTool Xtorm configuration tool. To handle the product, there is no need for tools. The terminal blocks are removable and are easy to install due to a spring insertion system for the field wiring.

Ensured Availability

The Series offers several architectures, redundant or not, allowing the use of simple to large and complex projects. In addition, the hot swapping feature eases the replacement of modules without powering down the system, which is an essential feature for systems that cannot stop.

Data Storage

The Multiple Block Storage (MBS) is a feature that brings different memories for program storage, commented source code, operands, retain data, log events and mass memory. This last one, made with a SD card is used for user files, data application storage (data logging) and project documentation through the Onboard Full Documentation (OFD) feature, which speeds up troubleshooting and ensures safety and reliability of the project information.

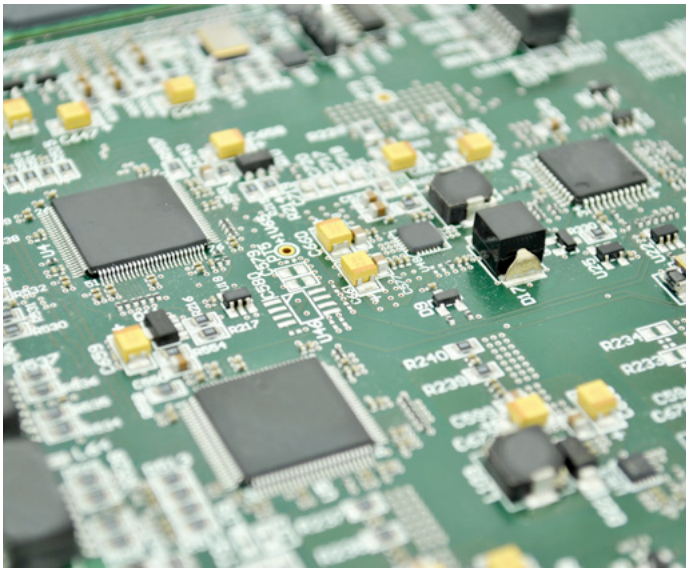
MBS

Friendly to the Environment

Eco friendly, Hadron Xtorm has large retain memory, no internal batteries and real-time clock (RTC) with long endurance. All Series modules come with protection in the components and electronic boards (conformal coating), seeking superior service life even in harsh environments. It also does not use lead in the manufacturing process which makes it compatible with the European ROHS directive. These features were made possible by the BFO (Battery Free Operation) technology which consists in using hardware and software algorithms that eliminate the need for internal information retention by using batteries, thereby reducing the environmental impact in disposing of these elements.

Hadron Xtorm products are also designed to meet the requirements established by Europian directives (CE), which allows its free trade in the European Economic Area.

BFO



Reliable

A Complete Tool

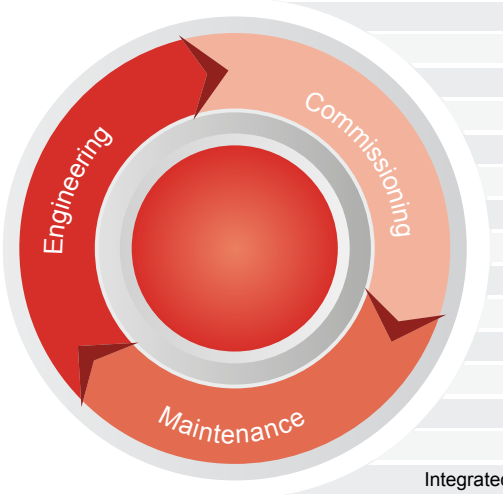
MasterTool Xtorm is a tool for configuration, programming, simulation and debugging of user applications tool. The software offers flexibility and ease of use, allowing spreadsheets data import for parameterization of modules or variables mapping in the communication protocols available in the CPU. Among the protocols and integrated services, there are MODBUS RTU, MODBUS TCP, DNP3, IEC 60870-5-104, IEC 61850 (GOOSE and MMS), OPC DA and time synchronization, not to mention the grouping of events that can be set graphically.

The MasterTool Xtorm has special editors that help a project to be easily configured. Its graphical user interface allows quick and friendly setup, it also gives the user a complete view of the application's architecture with the physical position and each module information. This allows the user to set all configuration parameters in one place, without using different software tools, speeding up the development and reducing engineering costs.

Customizable Environment

The MasterTool Xtorm software comes with a modern and customizable interface due to available docking resources. Those resources allow the user to configure bars, tools and menu structure, providing a different development experience. Object-oriented, the programming is graphical and friendly, with advanced editing capabilities, integrating software application, fieldbuses and processes into a single interface.

Lifecycle of Power Automation Projects



	Engineering	Commissioning	Maintenance
IEC 61131-3 Programming Languages	● ● ●	● ● ○	● ○ ○
Source Code and Project File Storage	● ○ ○	● ● ○	● ● ●
Code Reuse / User Library	● ● ●	● ● ○	● ○ ○
Graphical Bus Configuration	● ● ●	● ● ○	● ○ ○
Project Creation Wizards	● ● ●	● ○ ○	● ○ ○
Project Comparison	● ○ ○	● ● ○	● ● ●
Simulation	● ● ●	● ● ○	● ○ ○
Advanced Diagnostics	● ● ○	● ● ○	● ● ●
Customizable Environment	● ● ○	● ● ○	● ● ○
Project Cross-References	● ○ ○	● ● ●	● ● ○
Variables Monitoring / Trace Functions	● ○ ○	● ● ○	● ● ●
Online Application Changes	● ○ ○	● ● ○	● ● ●
Users Management and Rights Access	● ○ ○	● ● ●	● ● ●
Access and Information Log on the RTU	● ○ ○	● ● ○	● ● ●
Integrated Field Bus Communication and Configuration	● ● ●	● ● ○	● ● ○

Sophisticated Diagnostics

The diagnostic button, located in each module, has the One Touch Diag (OTD) feature, which displays advanced system information, such as a short circuit in the outputs, IP address and alphanumeric tags, among others, assisting in commissioning activities and avoiding technical documents handling at the time of maintenance. In conjunction with the Electronic Tag on Display (ETD) functionality, it allows the I/O module visualization of alphanumeric tags on the CPU graphical display.

OTD

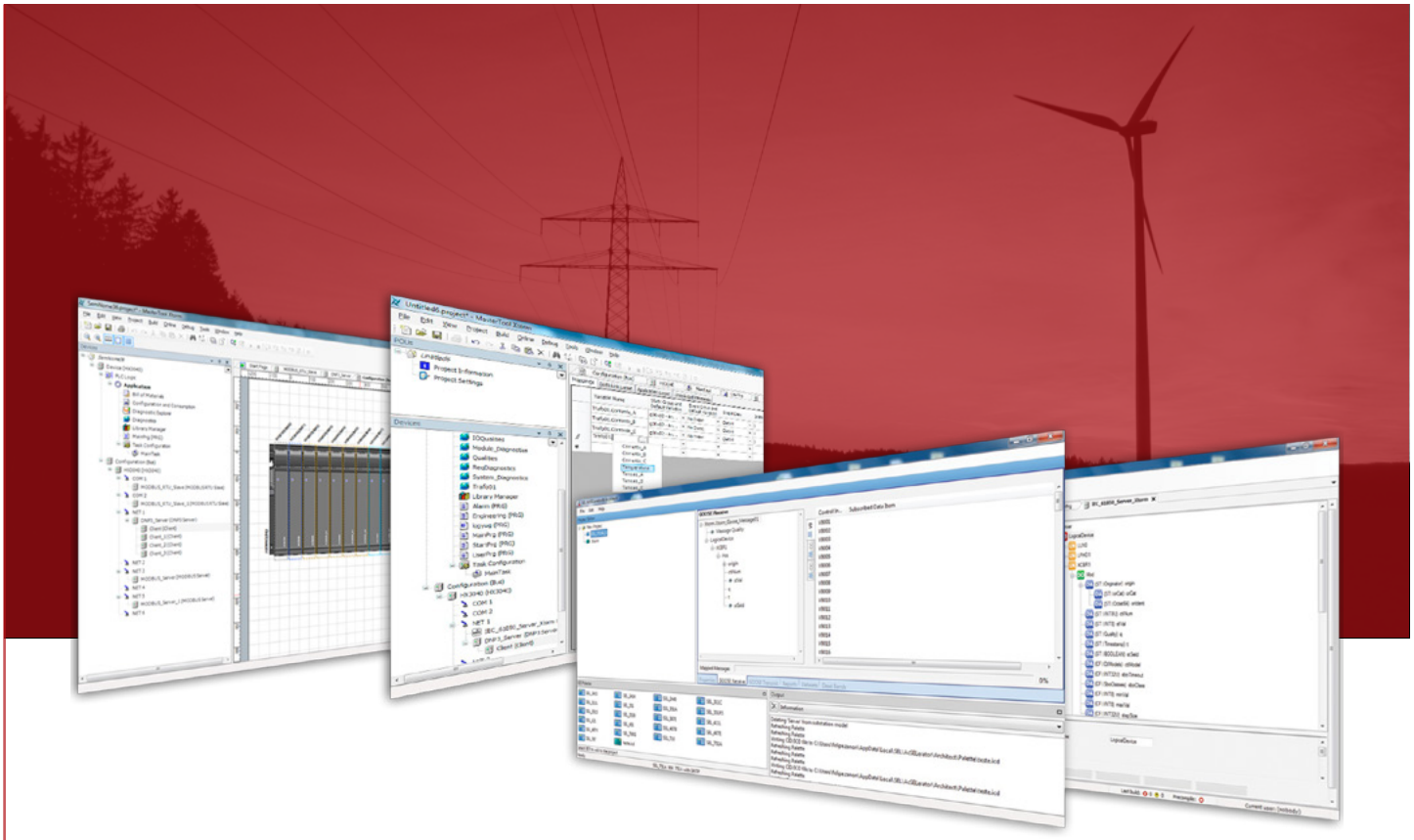
Documentation and Security of Applications

In order to have total security and control of the system, MasterTool Xtorm allows the storage of all source code, user comments, tags and descriptions of the application project. It provides different levels of controller and information access through user login, user groups, passwords and access rights.

MasterTool Xtorm has two different mechanisms for application protection and security: intellectual property protection and safe RTU login. The first protects the user's intellectual property, allowing to safeguard the entire project or files by setting a password. The second provides a way to protect the user's application of any unauthorized access. Therefore, Hadron Xtorm Series CPU requests a password before executing any commands, such as stopping, programming the application or forcing outputs in a module.

Easy Commissioning

Another advantage for the commissioning stage, offered by the configuration software, is the vast capacity for monitoring and forcing of digital and analog variables. The tool also features real-time simultaneous registries viewing and applications source code, as well as online editing and load of application. The trace functions allow the user to monitor internal variables directly into the controller in a graphical and practical way. This feature allows data viewing and application problems debugging without supervisory systems or any other external programs necessity.



Configuration and Programming

Programming languages determined in IEC 61131-3 are divided into two types: graphical and textual. In addition, it has a new configurator for IEC 61850 communication. It is fully integrated in the same tool. This makes the process of configuring IEC 61850 communication much faster and more efficient. With this feature, it is possible to configure the Logical Nodes, Datasets and Reports, as well as GOOSE communication with other IEDs via the SCL files export and import procedures.

Among languages, the FBD (Function Block Diagram) can be highlighted, based on function block calls, and CFC (Continuous Function Chart), similar to FBD, but with a numbered execution order. The SFC (Sequential Function Chart), the traditional LD (Ladder Diagram), the textual IL (Instruction List) and ST (Structured Text) are also available.

Quick Help

The complexity of configuration and programming of RTUs, based on the IEC 61131-3 and IEC 61850 standards, is significantly reduced in the Hadron Xtorm Series. Thanks to MasterTool Xtorm, it offers a complete set of help files with tips and descriptions. They aim to guide and serve as the first database knowledge and problem solution while the user develops its application. Besides, the help files are available in different languages in accordance with the installation options.

Multilingual

MasterTool Xtorm is available in Portuguese and English. After installation, the interface sets the language to the one of the computer´s operating system. It can be changed later without the need of resettlement.

Simulation

To enable the user to evaluate and test various algorithms and logic programming in one project before they are used, the simulation tool application is made available. It works online (real time) and offline, without the need for any connections with the controller. This is a great strategy for training and retraining of professionals. Also, the anticipation of errors in the planning and specification reduces the risk of failure in engineering projects. In maintenance and commissioning, the tool is also important because it allows changes to be previously tested without interfering with the actual system, avoiding accidents, damage to property and the environment, and loss of production or efficiency. Another feature is the use of the simulator to evaluate and estimate the resources needed when choosing the CPU, architecture analysis, power supply consumption requirements and logic verification.

Hadron Xtorm Series

Type	Code	Description
CPU	HX3040	High-Speed CPU, 6 Ethernet ports, 2 serial channels, memory card interface, I/O expansion and redundancy support
Input Modules	HX1100	32 DI 24 Vdc Module w/ Time Stamping
	HX1120	32 DI 125 Vdc Module w/ Time Stamping
	HX6000	16 AI Voltage/Current Module
	HX6020	8 AI Temperature (RTD) Module
Output Modules	HX2200	16 DO Relay Module
	HX2300	24 Vdc 16 DO Relay Module with CBO (Check Before Operate)
	HX2320	125 Vdc 16 DO Relay Module with CBO
Power Supply Modules	HX8300	60 W 24 Vdc Redundant Power Supply
	HX8320	60 W 125 Vdc Redundant Power Supply
Racks	HX9001	9-Slot Backplane Rack
	HX9003	18-Slot Backplane Rack
Software	HD8500	MasterTool Xtorm Advanced
Accessories	HX9102	Rack Connector Cover
	HX9401	6-Pin Terminal Block
	HX9402	10-Pin Terminal Block
	HX9405	4-Pin Terminal Block
	NX9202	RJ45-RJ45 (2 m) Cable
	NX9205	RJ45-RJ45 (5 m) Cable
	NX9210	RJ45-RJ45 (10 m) Cable

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