MESSUNG | industrial automation & controls

NX-ERA

Programmable Controllers Series

www.messungautomation.co.in

Control in your hands

Flexible: from medium to large systems, redundant or distributed
Reliable: high reliability for safety instrumented systems
Smart: accurate diagnostics and compact design
Efficient: superior performance and easy to use

“High performance with innovative features make NX-ERA Series the ideal solution for any automation and control system.”

The unique solution for your applications

NX-ERA Programmable Controllers Series is an advanced automation system capable and suitable for complex industrial processes, high performance machines and production lines.

NX-ERA Series presents resources for all stages of your application life cycle with its Integrated Distributed Control Systems (DCS) features, programming and configuration environment which is based on IEC 61131-3 standard, speeding up development and reducing engineering and commissioning costs.

NX-ERA system architecture offers redundancy features for CPU Power Supply, Supervision, Control Networks and Field Buses.

The NX-ERA Series also offers advanced diagnostics and hot swapping, minimizing or eliminating downtime for maintenance and ensuring a continuous production process.

Flexible

Superior Performance

The operating system of NX-ERA Series CPUs is multitasking and preemptive, enabling sophisticated applications and control of the processor's performance. The RISC 32-bit PowerPC processor combines high performance and lower power consumption. Therefore, there is no need for moving parts contributing to a higher MTBF (Mean Time Between Failures).

High Connectivity

NX-ERA Series supports hardware and software for OPC DA, traditional networks and field bus protocols (MODBUS RTU, MODBUS TCP, MODBUS RTU/TCP, PROFIBUS- DP, IEC 60870-5-104 Server, Ethernet/IP and EtherCAT) through its integrated CPU communication interface ports. Yet, in cases of necessity, users can develop their own protocols, allowing total integration with any industrial device.

Availability and Security

For applications that cannot be stopped, NX-ERA Series has redundant CPUs and hot swapping of its modules, minimizing downtime for maintenance.

Network Variables

Smart and versatile CPUs have features that enable the users to create, modify and share specific variables among several controllers connected on the network, which reduces the systems engineering time.

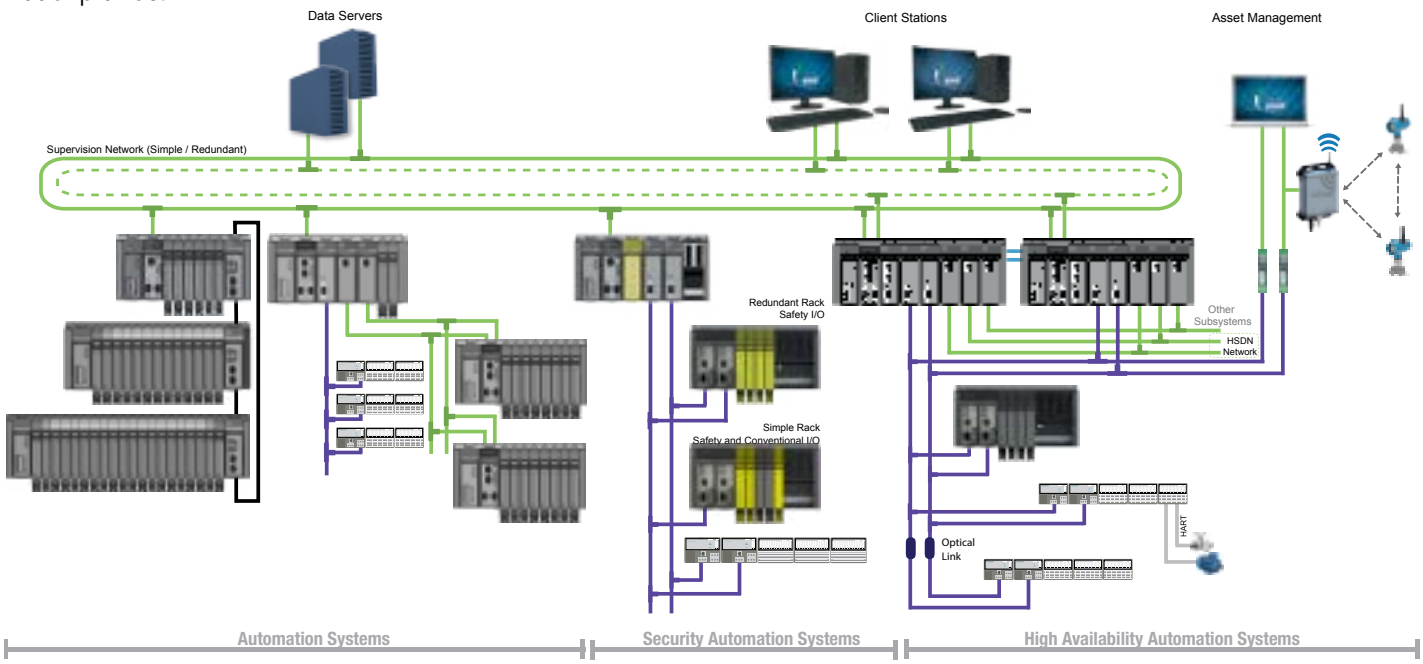
Scalar Architecture

The internal bus can be expanded using deterministic Ethernet to multiple remote backplane racks without performance loss.

One CPU can control up to 320 I/O on a single backplane; local backplane can be connected up to 24 remote backplanes.

NX-ERA Series is fully compatible with web services, such as:

- Web page server for diagnostics, supervision and product updates
- User visualization web pages for real-time application data monitoring and control
- SNTP for time synchronization and SNMP for Ethernet Network management



Remote I/O
PROFIBUS DP

Redundancy
Half Cluster

Cost Efficient
Modbus RTU/TCP

Rack I/O

NX-ERA Jet

> **“Rugged and high performance NX-ERA Jet is ideal for small and medium-sized applications.”**

NX-ERA Jet

NX-ERA Jet modules offer best cost effective solution combination of input and output modules for large and distributed systems as well as medium to small sized applications. Jet can be also combined with the main products of the series, such as CPUs, backplane racks, communication and fieldbus modules.

NX-ERA Jet Powerful Features

NX-ERA Jet has all the important features of the popular NX-ERA Series. It turns into a selection of input and output modules where requirements such as hot swapping and advanced functionalities such as OTD (One Touch Diag) and EPS (Easy Plug System) are no longer necessary. The result is a group of compact and economical modules capable of providing highly competitive solutions, with no loss of electrical characteristics such as isolation, performance and accuracy.

Reliable

NX-ERA Safety Solution

NX-ERA Series Programmable Controllers feature an exclusive solution of modules to be used in functional safety industrial applications. NX-ERA Safety Solution has been created with the purpose of minimizing the probability of dangerous failures on the development of projects and manufacturing of products. NX-ERA Safety modules have been designed with the highest technology in safety and integrity for different types of applications, to meet the most severe international failure analysis and standards.

International Standards

There are different standards related to product development for applications with functional safety requirements. The main one is IEC 61508, that states in a widespread way the requirements and procedures necessary to the development of this type of products.

In addition, IEC 61508 standard defines functional safety levels (SIL1, SIL2, SIL3 and SIL4) where each level is related to a maximum value of bearable dangerous failures. What defines the necessary SIL rating for each application is the level of risk to human and physical integrity. All products of NX-ERA Safety Solution allow up to SIL3 rating.

Industrial Machines

Another highly used standard is ISO 13849-1, especially in regards to machine functional safety. Just like IEC 61508, ISO 13849-1 states allowed dangerous failures rates as well as the requirements of two consecutive failures. The Series products meet Category 4 performance level, called Cat 4. 4 PLe.

Digital I/O Modules

NX2800 safety digital output module features PN outputs, allowing either the controlling of the output status to be made on the positive or the negative part of the load connection. This process ensures the output shut down even in the case of failure detection in one of the triggering circuits or failures in the internal logic of the product. In conventional digital output modules, there is no double activation for the outputs.

The digital input module NX1800 offers many different specific diagnostics to avoid erroneous status in case of mesh failures. The module counts on two output signal groups that feed the input values through safety switches and are responsible for continuous testing of the digital inputs.

Interoperability and Protection to your Investment

NX-ERA Safety Solution products allow the use of conventional and safety equipments on the same backplanes and communication networks. This feature enables the implementation of a simpler project with backplanes, power supply, network interface and integrated programming tools, besides ensuring data exchange between the Safety and the conventional CPU in a safe way. The data integrity is guaranteed by the use of a secure protocol, which in the case of the products in scope, PROFIsafe protocol.

PROFIsafe Communication

PROFIsafe is the most used safety communication protocol in industrial automation segment. The protocol reduces the probability of upcoming errors on data transmission between a controller and a SIL I/O module. In safety mixed systems, PROFIsafe is capable of coexisting with other communication protocols, such as PROFIBUS-DP. NX-ERA Safety Solution counts on two PROFIsafe slave modules, one with eight digital inputs (NX1800) and the other with four digital outputs (NX2800), in addition to a safety CPU (NX3810).

Smart

Practical and Modern

Easy Plug System (EPS) is a practical and safe terminal block insertion and extraction mechanism for input and output modules that exempts the use of auxiliary tools.

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 miniSD card is used for user files, data application storage (data logging) and project documentation through the Onboard Full Documentation (OFD) feature, which speeds up the resolution of problems and ensures safety and reliability of the project information.

Enhanced 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.

Friendly to the Environment

NX-ERA is eco friendly, has no internal battery, and is with large retentive memory and real-time clock (RTC) with long endurance. All NX-ERA Series modules come with protection in the components and electronic boards (conformal coating), seeking superior service life even in harsh environments.

International Certifications

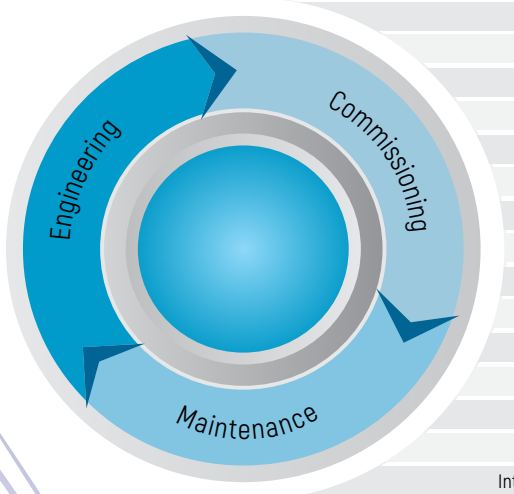
The high quality of NX-ERA Series is accredited by renowned technological institutes.

Efficient

A Complete Tool

NX-ERA Series has IEC 61131-3 based complete tool for programming, debugging, configuration and simulation of user applications: the MasterTool IEC XE. The software has resources for all stages of the life cycle of an automation and process control project, ensuring efficiency throughout the development, commissioning and maintenance.

Life Cycle of Automation and Process Control 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 Controller	● ○ ○	● ● ○	● ● ●
Integrated Field Bus Communication and Configuration	● ● ●	● ● ○	● ● ○

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 data viewing and applications source code, as well as online editing download application.

Quick Help

The configuration and programming complexity of programmable controllers based on IEC 61131-3 standards can be significantly reduced on NX-ERA Series, due to the complete group of assistance files with advices and descriptions of MasterTool IEC XE main features.

Documentation and Security of Applications

In order to achieve full control and maximum security over the system, MasterTool IEC XE allows full source code storage, comments, tags and application project descriptions, in addition to different access levels to controllers and information through user login, user groups, passwords and specific access rights.

Integrated Configuration

NX-ERA Series integrates field bus configuration and standard communication protocols, such as PROFIBUS-DP and MODBUS to the programming tool.

Simulation

MasterTool IEC XE offers a simulation tool which enables users to evaluate and test various project to its operation. It works in online mode (real time) and offline with no need of connection with the controller.

Web Server

In order to give flexibility and agility to the development of medium and small applications, NX-ERA Series now counts on a WebServer feature that allows its users to create supervision and monitoring screens without the use of any SCADA. Available on NX3005 CPU, the tool is embedded in the controller's memory and can be accessed through a web browser from any device (PC, tablet or smartphone) connected to the network. Besides allowing the user to remotely control the system, this function represents significant cost reductions to the project, once it exempts the use of any equipment or software dedicated specifically to supervision.

Programming Languages

The software allows the use of these different languages determined in IEC 61131-3 both graphical and textually in the same project, providing to the user a powerful way to organize the application, and reuse codes developed in previous solutions. It can convert the application among graphical languages and reuse them in other software versions.

Among the graphics languages, the FBD (Function Block Diagram), CFC (Continuous Function Chart), SFC (Sequential Function Chart) and traditional LD (Ladder Diagram) stands out. The available textual languages are ST (Structured Text), a high-level industrial control language with common commands in structured languages, specific logical and mathematical operations, and IL (Instruction List), a low-level language, recommended for applications in which the timing requirement is important.

NX-ERA Series

Type	Code	Communication Ports	Protocols	Bus Expansion	Embedded Power Supply	Memory Card
CPUs	NX3003	1x Serial (RS-485) 1x Ethernet TCP/IP	Standard protocols*	No	Yes	No
	NX3004	1x Serial (RS-485/RS-422) 1x Ethernet TCP/IP	Standard protocols*	1	Yes	No
	NX3005	1x Serial (RS-485/RS-422) 1x Ethernet TCP/IP	IEC 60870-5-104 Server, EtherNet/IP, WebServer and standard protocols*	up to 4	Yes	No
	NX3010	2x Serial (RS-232 e RS-485/RS-422) 1x Ethernet TCP/IP	EtherNet/IP and standard protocols*	up to 8	No	Yes
	NX3020	2x Serial (RS-232 e RS-485/RS-422) 2x Ethernet TCP/IP	IEC 60870-5-104 Server, EtherNet/IP, EtherCAT and standard protocols*	up to 24	No	Yes
	NX3030	2x Serial (RS-232 e RS-485/RS-422) 2x Ethernet TCP/IP	IEC 60870-5-104 Server, EtherNet/IP, EtherCAT and standard protocols*	up to 24	No	Yes
Communication Modules	NX5000	10/100 Mbps Ethernet TCP/IP Module				
	NX5001	PROFIBUS-DP Master				
	NX5100	MODBUS TCP Head				
	NX5101	MODBUS TCP Head				
	NX5110	PROFIBUS-DP Head				
	NX5210	Redundant PROFIBUS-DP Head				
Input Modules	NX1001	24 Vdc 16 DI Module				
	NX6000	8 AI Voltage/Current Module				
	NX6010	8 AI Thermocouple Module				
	NX6020	4 AI RTD Module				
Output Modules	NX2001	24 Vdc 16 DO Transistor Module				
	NX2020	16 DO Relay Module				
	NX6100	4 AO Voltage/Current Module - 16 bits				
Mixed I/O Modules	NX1005	24 Vdc 8 DO Transistor / 8 DI Mixed Module				
Power Supply Modules	NX8000	30 W 24 Vdc Power Supply Module				
Racks	NX9010	8-Slot Backplane Rack (no hot swap)				
	NX9000	8-Slot Backplane Rack				
	NX9001	12-Slot Backplane Rack				
	NX9002	16-Slot Backplane Rack				
	NX9003	24-Slot Backplane Rack				
NX-ERA Jet Modules	NJ1001	24 Vdc 16 DI Module				
	NJ1005	8 DO 24 Vdc Transistor and 8 DI 24 Vdc Mixed Module				
	NJ6000	8 AI Voltage/Current Module - 16 bits				
	NJ6001	6 AI Voltage/Current Module - 12 bits				
	NJ6010	8 AI Thermocouple Module				
	NJ6011	4 AI Thermocouple Module				
	NJ6020	8 AI RTD Module				
	NJ2001	24 Vdc 16 DO Transistor Module				
	NJ6100	4 AO Voltage/Current Module - 16 bits				
	NJ6101	4 AO Voltage/Current Module - 12 bits				
	NJ6005	4 AO / 6 AI Mixed Module - 12 bits				
Safety Modules (SIL3)	NX3810	Functional Safety Module CPU				
	NX1800	24 Vdc 8 DI Functional Safety				
	NX2800	24 Vdc 4 DO Functional Safety Transistor				
Special Modules	NX4000	Bus Expansion Module				
	NX4010	Redundancy Link Module				
Software	Tools LITE	Programming software - Lite				
	Tools BASIC	Programming software - Basic				
	Tools PRO	Programming software - Professional				
	Tools ADV	Programming software - Advanced				

*Standard protocols: MODBUS RTU, MODBUS TCP, MODBUS RTU/TCP, SNTP, SNMP and OPC DA.

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