

TYPE-EXAMINATION CERTIFICATE

1. Type-examination Certificate (Module A)
2. Equipment or Protective System intended for use in potentially explosive atmospheres (Directive 2014/34/EU)



3. Type examination certificate Nr **ITS-I21ATEX28912X R.0**

4. **Product:** Hazardous Locations Control modules

5. **Manufacturer:** Xin Hua Control Engineering Co Ltd **Applicant:** Nexus Controls LLC
(a branch of Nexus Controls LLC)

6. **Address:** 160 Wen Jing Road, Minhuang District, **Address:** 1800 Nelson Rd, Longmont, CO
Shanghai, ZIP 200245, China 80501-6324, USA

7. This product and any acceptable variation thereto are specified in the schedule to this certificate and therein referred to.
8. INTERTEK ITALIA S.p.A., certifies that the equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmosphere, given in Annex II of the Directive.

The examination and tests results are recorded in confidential technical evaluation Intertek Report Nr. 104462645DAL-002.

9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with Standards EN 60079-0:2018, EN 60079-7: 2015/A1:2018, EN 60079-15:2019 except in respect of those requirements referred to at item 16 of the Schedule.
10. If the sign X is placed after the certificate number, it indicates that the product is subject to Special Conditions for Safe Use specified in the schedule to this certificate.
11. This Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.
12. The marking of the product shall include the following:



II 3 G
Ex ec nC IIC T4 Gc
Tamb: -20°C ≤ Ta ≤ 50°C

29 June 2021

Certificate issue date

Todd L. Relyea
Certification Officer
Intertek Italia S.p.A.



This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

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13. DESCRIPTION OF THE EQUIPMENT OR PROTECTIVE SYSTEM

The products covered by this report are the programmable logic control modules, Analog Input Modules, Analog Output Modules, Digital Input Modules, Digital Output Modules, Valve Position Control Modules, Speed Measurement Modules, Extension Modules, Logic Modules and Relay Modules. All the models are intended to be mounted in the panel (by others, this report does not cover any panel) and intended to be operated and communicated with other. The modules are intended for industrial process control and data communication. All modules are intelligent data acquisition and processing module.

All modules listed below:

MPU55-CBACN, MPU56-CBACN, MPU57-CBACN, MAI50-CBACN, MAI51-CBACN, MAI52-CBACN, MAI53-CBACN, MAI54-CBACN, MHT50-CBACN, MAO50-CBACN, MHO50-CBACN, MDI50-CBACN, MDI50A-CBACN, MDI52-CBACN, MDI53-CBACN, MDO53-CBACN, MDO55-CBACN, MVP50-CBACN, MVP51-CBACN, MVP52-CBACN, MVP53-CBACN, BVP53-CBACN, MSP50-CBACN, MSP51-CBACN, MCD50-CBACN, MCD51-CBACN, MLP50-CBACN, BLP50-CBACN, 2003-CBACN, TCBT-CBACN, TCBB-CBACN, SDO60-CBACN, BSDO60-CBACN, SPU60-CBACN, BSPU60-CBACN, SAI60-CBACN, BSAI60-CBACN, SDI60-CBACN, BSDI60-CBACN

Model Similarity:

The control modules MPU55, MPU56 and MPU57 are integrated stand-alone computers that run the application code and provides a universal control platform for the Nexus system, according to the firmware loaded on the controller.

The Nexus I/O bus & power extension module MCD50 provides the electrical interface between the IO modules and the controller's I/O bus (iLink), as well as the cabinet's DC power system.

Each I/O module contains a processor circuit which is common to all Nexus I/O modules. The Nexus analog input modules MAI50, MAI51, MAI52, MAI53, MAI54 and MHT50 contain a processor subsystem and an acquisition circuit specific to either temperature input function or any other analog input function.

The Nexus analog output modules MAO50 and MHO50 contain a processor subsystem and an acquisition circuit specific to the analog output function . Most analog output channels can provide current output with signal range from 4 to 20mA, while some can be configured for 1-5V dc output.

The Nexus discrete input module MDI50, MDI50A and MDI53 contain a processor subsystem and an acquisition circuit specific to the digital input function .

The Nexus discrete output module MDO53 and MDO55 contain a processor subsystem and an acquisition circuit specific to the digital output function.

The speed measurement modules MSP50 and MSP51 contain a processor subsystem (MCU), a Field Programmable Gate Array (FPGA) and an acquisition & output circuit specifically for speed detection and protection function. The module can provide a number of speed input, mA/V analog inputs, discrete inputs and discrete outputs.



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The Nexus valve position control modules MVP50, MVP51, MVP52, MVP53 and BVP53 are an integrated I/O module specific for valve position control. The module has redundant input/output channels and on-board PID servo control loop.

MLP50 is TMR Emergency Trip System (ETS) plug-in programmable logic protection module.

BLP50 is TMR Emergency Trip System (ETS) base terminal board module.

TCB-T - top train connection board

TCB-B - bottom train connection board

SDO60 - sdo 6chs digital output module

BSDO60 - sdo 6chs base board module

SPU60 - spu control module

BSPU60 - spu base board module

SAI60 - sai 8chs analog input module

BSAI60-F - sai 8chs base board module

SDI60 - sdi 24chs digital input module

BSDI60-F - sdi 24chs base board module

See below table for details.

Module Name	Haz , Panel Mount Module SAP part numbers	Haz , PCBA SAP part numbers	HAZ AREA PCB PART NUMBER	Description of use	input VOLTAGE (max)
MAI50	MAI50-CBACN	MAI50-BBACN	MAI50-ABACN	ma/V analog input module 16 channels	24VDC, 11.0W
MAI51	MAI51-CBACN	MAI51-BBACN	MAI51-ABACN	TC/RTD analog input module 16 channels	24VDC, 1.8W
MHT50	MHT50-CBACN	MHT50-BBACN	MHT50-ABACN	mA/V Analog input module 8 channels with HART	24VDC, 6.62W
MAI52	MAI52-CBACN	MAI52-BBACN	MAI52-ABACN	mA/V Analog input module 8 channels	24VDC, 6.5 W
MAI53	MAI53-CBACN	MAI53-BBACN	MAI53-ABACN	mA/V Analog input module 16 channels with individual ADC	24VDC, 12.7W
MAI54	MAI54-CBACN	MAI54-BBACN	MAI54-ABACN	mA/V Analog Input Module 8 Channels with Individual ADC, fast sampling	24VDC, 9.2W
MHO50	MHO50-CBACN	MHO50-BBACN	MHO50-ABACN	mA/V Analog output module 8 channels with HART	24VDC, 6.7W



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Module Name	Haz , Panel Mount Module SAP part numbers	Haz , PCBA SAP part numbers	HAZ AREA PCB PART NUMBER	Description of use	input VOLTAGE (max)
MAO50	MAO50-CBACN	MAO50-BBACN	MAO50-ABACN	mA/V analog output module 8 channels	24VDC, 6.55W
MDI50	MDI50-CBACN	MDI50-BBACN	MDI50-ABACN	Digital input module 32 channels	24VDC, 8.5W
MDI52	MDI52-CBACN	MDI52-BBACN	MDI52-ABACN	digital input module 16 channels	24VDC, 5.0 W
MDI53	MDI53-CBACN	MDI53-BBACN	MDI53-ABACN	digital module 16 channels 24VDC/48VDC/125VDC	24VDC, 3.8W 112.5-137.5 VDC, 6.2W wetting
MDI50A	MDI50A-CBACN	MDI50A-BBACN	MDI50A-ABACN	Option board to MDI50 module, 32CHs 24VDC Digital Input	24VDC, 8.5W, wetting
MDO53	MDO53-CBACN	MDO53-BBACN	MDO53-ABACN	digital output module 16 AC relay channels	Supply: 24Vdc, 11.0W Load: 8A/30VDC
MDO55	MDO55-CBACN	MDO55-BBACN	MDO55-ABACN	digital output 16 channels with source transistor output	21.6-26.4 VDC, 2.6 W power 24 VDC, 48 W or 48 VDC, 96 W External Power max per chan 24 VDC, 6 W max per chan 48 VDC, 12 W max of 2 A or 96 W for all Channels output power
MVP50	MVP50-CBACN	MVP50-BBACN	MVP50-ABACN	Valve position control module	24VDC, 11.0 W
MVP51	MVP51-CBACN	MVP51-BBACN	MVP51-ABACN	Triple redundant LVDT valve position Control Module	24VDC, 11.0 W
MVP52	MVP52-CBACN	MVP52-BBACN	MVP52-ABACN	Valve Position Control Module, dual redundant servo control application	24VDC, 11.0 W
MVP53	MVP53-CBACN	MVP53-BBACN	MVP53-ABACN	TMR Valve Position Control Module	24VDC, 6.0W
MSP50	MSP50-CBACN	MSP50-BBACN	MSP50-ABACN	Speed Measurement and protection module	24VDC, 7.6W
MSP51	MSP51-CBACN	MSP51-BBACN	MSP51-ABACN	Speed Measurement and Logic Protection Module(MSP50 hardware, different firmware)	24VDC, 7.6W
MLP50	MLP50-CBACN	MLP50-BBACN	MLP50-ABACN	TMR programable logic control module	Supply: 24VDC, 6.8W
MCD50	MCD50-CBACN	MCD50-BBACN	MCD50-ABACN	iLink & 24VDC Extension Module	24VDC, 0.1W
MCD51	MCD51-CBACN	MCD51-BBACN	MCD51-ABACN	iLink & 24VDC Extension Module	24VDC, 0.1W
MPU55	MPU55-CBACN	MPU55-BBACN	MPU55-ABACN	Controller Module	24VDC, 7.2W
MPU56	MPU56-CBACN	MPU56-BBACN	MPU56-ABACN	Controller Module	24VDC, 7.2W
MPU57	MPU57-CBACN	MPU57-BBACN	MPU57-ABACN	Controller Module	24VDC, 7.2W
BLP50	BLP50-CBACN	BLP50-BBACN	BLP50-ABACN	TMR Programmable Logic Protection Base Module	Supply: 24VDC, 9.5W Load: 4A/30VDC
BVP53	BVP53-CBACN	BVP53-BBACN	BVP53-ABACN	TMR Valve Position Control Base Module(for MVP53)	24VDC, 0.1W
2oo3	2oo3-CBACN	2oo3-BBACN	2oo3-ABACN	2oo3 Relay module	24VDC, 1.5W
TCBT	TCBT-CBACN	TCBT-BBACN	TCBT-ABACN	TOP TRAIN CONNECTION BOARD	input: 20.4-28.8VDC, 0.1 W , output: 20.4-28.8VDC
TCBB	TCBB-CBACN	TCBB-BBACN	TCBB-ABACN	BOTTOM TRAIN CONNECTION BOARD	input: 20.4-28.8VDC, 0.1 W output: 20.4-28.8VDC
SDO60	SDO60-CBACN	SDO60-BBACN	SDO60-ABACN	SDO 6CHs DIGITAL OUTPUT MODULE	input: 20.4-28.8VDC, 2W, Transistor output: 0.3A @ 24V dc
BSDO60	BSDO60-CBACN	BSDO60-BBACN	BSDO60-ABACN	SDO 6CHs BASE BOARD MODULE	input: 20.4-28.8VDC, 12W, output: 20.4-28.8VDC, Relay output: 30VDC



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Module Name	Haz , Panel Mount Module SAP part numbers	Haz , PCBA SAP part numbers	HAZ AREA PCB PART NUMBER	Description of use	input VOLTAGE (max)
SPU60	SPU60-CBACN	SPU60-BBACN	SPU60-ABACN	SPU CONTROL MODULE	input: 20.4-28.8VDC, 5W
BSPU60	BSPU60-CBACN	BSPU60-BBACN	BSPU60-ABACN	SPU BASE BOARD MODULE	input: 20.4-28.8VDC, 0.1W, output:20.4-28.8VDC
SAI60	SAI60-CBACN	SAI60-BBACN	SAI60-ABACN	SAI 8CHs ANALOG INPUT MODULE	input: 20.4-28.8VDC 5W
BSAI60	BSAI60-CBACN	BSAI60-BBACN	BSAI60-ABACN	SAI 8CHs BASE BOARD MODULE	input: 20.4-28.8VDC, 6W, Output:20.4-28.8VDC
SDI60	SDI60-CBACN	SDI60-BBACN	SDI60-ABACN	SDI 24CHs DIGITAL INPUT MODULE	input: 20.4-28.8VDC, 5W
BSDI60	BSDI60-CBACN	BSDI60-BBACN	BSDI60-ABACN	SDI 24CHs BASE BOARD MODULE	input: 20.4-28.8VDC, 2W, output:20.4-28.8 VDC

14. DRAWINGS AND DOCUMENTS

TITLE	DOCUMENT Nr	LEVEL	DATE
NEXUS ONCORE IECEX LABELS, SMALL	154M6671	N/A	2021-02-12
EXPLOSION HAZARD LABEL	153M5148	N/A	2021-01-07
NEXUS ONCORE MODULE IECEX LABELS	152M7204	A	2021-02-12
Nexus OnCore Modules ATEX/IECEX/UL/CAN Manual Addendum	NCM10080	A	January 2021
2003 Relay Board	2003-BBACN	N/A	11/30/2020
BLP 50	BLP50-BBACN	N/A	11/19/2020
BSAI60	BSAI60-BBACN	N/A	12/01/2020
BSDI60	BSDI60-BBACN	N/A	12/01/2020
BSDO60	BSDO60-BBACN	N/A	12/01/2020
BSPU60	BSPU60-BBACN	N/A	12/01/2020
BVP53	BVP53-BBACN	N/A	11/30/2020
MAI50	MAI50-BBACN	N/A	11/19/2020
MAI51	MAI51-BBACN	N/A	11/19/2020
MAI52	MAI52-BBACN	N/A	11/19/2020
MAI53	MAI53-BBACN	N/A	11/19/2020



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TITLE	DOCUMENT Nr	LEVEL	DATE
MAI54	MAI54-BBACN	N/A	11/19/2020
MAO50	MAO50-BBACN	N/A	11/19/2020
MCD50	MCD50-BBACN	N/A	11/19/2020
MCD51	MCD51-BBACN	N/A	11/19/2020
MDI50A	MDI50A-BBACN	N/A	2020/12/01
MDI50	MDI50-BBACN	N/A	2020/12/01
MDI52	MDI52-BBACN	N/A	2020/12/01
MDI53	MDI53-BBACN	N/A	2020/12/01
MDO53	MDO53-BBACN	N/A	2020/12/01
MDO55	MDO55-BBACN	N/A	2020/12/01
MHO50	MHO50-BBACN	N/A	11/19/2020
MHT50	MHT50-BBACN	N/A	11/19/2020
MLP 50	MLP50-BBACN	N/A	11/30/2020
SOC CONTROLLER	MPU55-BBACN	N/A	11/19/2020
ICFC DEH MSP50	MSP50-BBACN	N/A	11/30/2020
MVP50	MVP50-BBACN	N/A	11/30/2020
MVP53	MVP53-BBACN	N/A	11/30/2020
SAI60	SAI60-BBACN	N/A	12/01/2020
SDI60	SDI60-BBACN	N/A	12/01/2020
SDO60	SDO60-BBACN	N/A	12/1/2020
SPU60	SPU60-BBACN	N/A	12/01/2020
TCB_BOTTOM	TCBB-BBACN	N/A	12/01/2020
TCB_TOP	TCBT-BBACN	N/A	12/01/2020

Copies of the above listed documents are kept at Intertek Italia S.p.A. archive.



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15. SPECIAL CONDITIONS FOR SAFE USE

- The Programmable Control and I/O Modules shall be installed in a suitable ATEX certified Ex e, and minimum ingress protection IP54 enclosure as per the instructions, parts, and specifications provided in Service Manual.
- The end use enclosure shall be tool secured and shall not be opened in the presence of ignitable concentration of explosive gas atmosphere and do not connect/ disconnect this device unless the power has been switched off or the area is deemed to be non-hazardous. Grounding/Bonding wire shall be provided.
- The Programmable Control and I/O Modules shall only be powered by a secondary circuit not exceeding 24V.

16. ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

The relevant essential Health and Safety Requirements have been identified and assessed in Intertek Report Nr. 104403637DAL-003 Revision 0 dated March 23, 2021.

17. ROUTINE (FACTORY) TESTS

- **Routine Electric Strength Test per Clause 7.1 of EN 60079-7: 2015/A1:2018**

A routine electric strength test will be required between the connector pins and the enclosure of fully assembly system. A test voltage of 500V r.m.s. or 700VDC is to be applied for 60s and no breakdown of insulation or separation shall occur. Alternatively, a test shall be carried out at 1.,2 times the test voltage, but maintained for at least 100 ms.