

OMRON

NX Series

Safety Precautions

Thank you for purchasing an NX-Series. To ensure the safe usage of the Controller, read and understand this document and the manuals for all other Units in the Controller. Contact your OMRON representative and make sure that you use the most recent version of each manual. Keep this document and all relative manuals in a safe place, and make sure that they are delivered to the final user of the Controller.

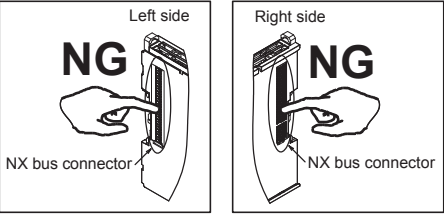


OMRON Corporation

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3604736-9D

Do not touch the NX bus connector



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Safety Precautions

● Meanings of Warning Indications

WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Additionally, there may be severe property damage.

CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

● Warning Indications

WARNING

Do not touch any of the terminals or terminal blocks while the power is being supplied. Doing so may result in electric shock.

Do not attempt to take any Unit apart. In particular, high-voltage parts are present in the Unit that supplies power while power is supplied or immediately after power is turned OFF. Touching any of these parts may result in electric shock. There are also sharp internal parts that may cause injury.

Provide safety measures in external circuits to ensure safety in the system if an abnormality occurs due to malfunction of the CPU Unit, Industrial PC, other Units, or slaves or due to other external factors affecting operation. Not doing so may result in serious accidents due to incorrect operation.

- Emergency stop circuits, interlock circuits, limit circuits, and similar safety measures must be provided in external control circuits.
- The CPU Unit and Industrial PC will turn OFF all outputs from Basic Output Units in the following cases.
The remote I/O slaves will operate according to the settings in the slaves.
If an error occurs in the power supply
If the power supply connection becomes faulty
If a CPU watchdog timer error or CPU reset occurs
If a major fault level Controller error occurs
While the CPU Unit is on standby until RUN mode is entered after the power is turned ON
External safety measures must be provided to ensure safe operation of the system in such cases.
- The Controller outputs may remain ON or OFF due to deposition or burning of the output relays or destruction of the output transistors. As a countermeasure for such problems, external safety measures must be provided to ensure safe operation of the system.
- If external power supplies for slaves or other devices are overloaded or short-circuited, the voltage will drop, outputs will turn OFF, and the system may be unable to read inputs. Provide external safety measures in controls with monitoring of external power supply voltage as required so that the system operates safely in such a case.
- You must take fail-safe measures to ensure safety in the event of incorrect, missing, or abnormal signals caused by broken signal lines, momentary power interruptions, or other causes. Not doing so may result in serious accidents due to incorrect operation.

Make sure that the voltages and currents that are input to the Units and slaves are within the specified ranges. Inputting voltages or currents that are outside of the specified ranges may damage the Unit or cause fire.

Always confirm safety at the destination before you transfer the Unit configuration information, parameters, set values, or other data from the Sysmac Studio or other Support Software. The devices or machines may perform unexpected operation regardless of the operating mode of the CPU Unit.

CAUTION

When you connect a computer or other peripheral device to a Communications Coupler Unit that has a non-isolated DC power supply, either ground the 0-V side of the external power supply (i.e. Unit power supply) or do not ground it at all.
If the peripheral devices are grounded incorrectly, the external power supply (i.e. Unit power supply) may be short-circuited.

Execute online editing only after confirming that no adverse effects will be caused by deviations in the timing of I/O. If you perform online editing, the task execution time may exceed the task period, I/O may not be refreshed with external devices, input signals may not be read, and output timing may change.

Precautions for Safe Use

- When transporting any Unit, use the special packing box for it. Also, do not subject the Unit to excessive vibration or shock during transportation.
- Do not drop any Unit or subject it to abnormal vibration or shock. Doing so may result in Unit malfunction or burning.
- Mount connectors only after checking the mounting location carefully. Make sure the locking devices are properly locked into place.
- Do not apply labels or tape to the Unit. When the Unit is installed or removed, adhesive or scraps may adhere to the pins in the NX bus connector, which may result in malfunctions.

全停止フォールトレベルのコントローラ異常が発生したとき
電源投入から運転モードに移行するまでの起動中
これらのとき、システムが安全側に動作するよう、外部で対策を施してください。
(3) 出力リレーの溶着や焼損、出力トランジスタの破壊などによって、出力がONまたはOFFになったままになることがあります。このとき、システムが安全側に動作するように、外部で対策を施してください。
(4) スレーブ機器などの外部電源が過負荷状態になる、または短絡状態になると、電圧が低下し、出力がOFFになります。このときシステムが安全側に動作するよう、必要に応じて外部電源電圧を監視し、制御に取り込むなど外部で対策を施してください。
(5) 信号線の断線、瞬時停電による異常信号などに備えて、ご使用者側でフェールセーフ対策を施してください。異常動作により重大な事故につながる恐れがあります。

ユニット/スレーブに入力する電圧/電流は定められた範囲で入力してください。範囲外の電圧/電流を使用すると故障や火災の原因となります。

Sysmac Studio 等のツールからユニット構成情報、パラメータ等の各種データ、設定値を転送するときは、転送先の安全を確認してから行ってください。コントローラの動作モードにかかわらず、装置や機械が想定外の動作をする恐れがあります。

注意

非絶縁DC電源を持つ通信ケーブルユニットに、パソコンなどの周辺機器を接続するときは、外部電源（ユニット電源）をOV側で接地するか、または接地しないでください。周辺機器の接地方法によっては、外部電源（ユニット電源）が短絡することがあります。

入出力タイミングが乱れても影響のないことを確認してからオンラインエディットをしてください。オンラインエディットすると、タスク実行時間がタスク周期を上回り、外部との入出力が更新されず、入力信号を読み取れなかったり、出力タイミングが乱れたりする場合があります。

安全上の要点

- ユニットを輸送するときは、専用の梱装箱を使用してください。また、輸送中に過度な振動や衝撃が加わらないように注意してください。
- 製品を落下させたり、異常な振動・衝撃を与えたりしないでください。製品の故障、焼損の可能性がります。
- コネクタは装着位置を十分確認してから、装着してください。必ずロックしていることを確認してから使用してください。
- ユニットには、シールやテープなどを貼り付けしないでください。ユニットの取り付け/取り外し時に、粘着物や屑がNXバスコネクタの端子に付着し、誤動作する恐れがあります。
- ユニットのON/OFFバスコネクタの端子に触れないでください。NXバスコネクタの端子に汚れが付着し、ユニットが誤動作する恐れがあります。
- NXユニットの禁止領域に、インクで文字などを書き込んだり、汚したりしないでください。ユニットの取り付け/取り外し時に、インクや汚れがNXバスコネクタの端子に付着し、スレーブターミナルが誤動作する恐れがあります。禁止領域については、『NXシリーズ RFIDユニット ユーザーズマニュアル (SDGR-717)』を参照してください。

- Do not touch the pins in the NX bus connector on the Unit. Dirt may adhere to the pins in the NX bus connector, which may result in malfunctions.
- Do not write on the NX Unit with ink within the restricted region. Also do not get this area dirty. When the Unit is installed or removed, ink or dirt may adhere to the pins in the NX bus connector, which may result in malfunctions in the Slave Terminal. For the restricted region, refer to the *NX-series RFID Control Unit User's Manual* (Z401).
- Double-check all wiring and switch settings to make sure that they are correct before turning ON the power supply.
- Double-check all wiring before turning ON the power supply. Use the correct wiring parts and tools when you wire the system.
- Do not pull on the cables or bend the cables beyond their natural limit. Also, do not place heavy objects on top of the cables or other wiring lines. Doing so may break the cables.
- When wiring or installing the Units, do not allow metal fragments to enter the Units.
- Ground the frame ground (FG) terminal on the NX-V680 Unit to 100 Ω or less. Otherwise, performance may deteriorate.
- Use the I/O power supply capacity within the range that is given in the Unit specifications.
- Provide suitable power supply capacity according to the reference manuals.
- Use the power supply voltage that is specified in the related manuals.
- When you set the Operating Mode at Startup, confirm that no adverse effect will occur in the system.
- Check the user program, data, and parameter settings for proper execution before you use them for actual operation.
- Always turn OFF the power supply to the Units before you attempt any of the following.
 - Mounting or removing NX Units, Communications Coupler Units, or the CPU Unit
 - Assembling the Units
 - Connecting cables or wiring the system
 - Connecting or disconnecting connectors
- Power Supply Unit may continue to supply power to the rest of the Units for a few seconds after the power supply turns OFF. The PWR indicator is lit during this time. Confirm that the PWR indicator is not lit before you perform any of the above.
- Confirm that no adverse effect will occur in the system before you attempt any of the following.
 - Changing the operating mode of the CPU Unit (including changing the setting of the Operating Mode at Startup)
 - Changing the user program or settings
 - Changing set values or present values
 - Forced refreshing
- Do not exceed the ranges that are given in the specifications for the communications distance and number of connected Units.
- When you replace a Unit, start operation only after you transfer the settings and variables that are required for operation to the new Unit.

Precautions for Correct Use

- Follow the instructions in the manuals to correctly perform installation and wiring.
- Do not operate or store the Controller in the following locations.
 - Burnout may occur, operation may stop or malfunctions may occur.
 - Locations subject to direct sunlight
 - Locations subject to temperatures or humidity outside the range specified in the specifications
 - Locations subject to condensation as the result of severe changes in temperature
 - Locations subject to corrosive or flammable gases
 - Locations subject to dust (especially iron dust) or salts
 - Locations subject to exposure to water, oil, or chemicals
 - Locations subject to shock or vibration
- Take appropriate and sufficient countermeasures when installing the Controller in the following locations.
 - Locations subject to strong, high-frequency noise
 - Locations subject to static electricity or other forms of noise
 - Locations subject to strong electromagnetic fields
 - Locations subject to possible exposure to radioactivity
 - Locations close to power lines
- Before touching a Unit, be sure to first touch a grounded metallic object in order to discharge any static build-up.
- Use the rated power supply voltage for the Units that supply power. Take appropriate measures to ensure that the specified power with the rated voltage and frequency is supplied in locations

- Install the Units away from sources of heat and ensure proper ventilation. Not doing so may result in malfunction, in operation stopping, or in burning.
- Do not allow foreign matter to enter the openings in the Unit. Doing so may result in Unit burning, electric shock, or failure.
- Do not turn OFF the power supply while data is being transferred.

Relevant Manuals

Model numbers and manual name		Cat. No.
NX-V680C□	Machine Automation Controller NX-series RFID Control Units User's Manual	Z401
V680-H□ V680(S)-D□	V680 Series User's Manual for Amplifiers, Antennas, and RF Tags (FRAM)	Z248
V680-H□ V680-D□	V680 Series User's Manual for Amplifiers, Antennas, and RF Tags (EEPROM)	Z262
NX-ECC20□	Machine Automation Controller NX-series EtherCAT® Coupler Units User's Manual	W519
NX Series	Machine Automation Controller NX-series Data Reference Manual	W525
SYSMAC-SE2□□□	Sysmac Studio Version 1 Operation Manual	W504

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.
NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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Note: Specifications are subject to change without notice.

参照マニュアル

形式 / マニュアル名称	Man. No.
形NX-V680C□	マシンオートメーションコントローラ NXシリーズ RFIDユニット ユーザーズマニュアル SDGR-717
形V680-H□ 形V680(S)-D□	V680シリーズ タグ・アンブ ユーザーズマニュアル (FRAMタイプ) SCHI-707
形V680-H□ 形V680-D□	V680 シリーズ タグ・アンブ ユーザーズマニュアル (EEPROMタイプ) SCHI-709
形NX-ECC20□	マシンオートメーションコントローラ NXシリーズ EtherCAT®カプラユニット ユーザーズマニュアル SBCD-361
NXシリーズ	マシンオートメーションコントローラ NXシリーズ データリファレンスマニュアル SBCA-410
形SYSMAC-SE2□□□	Sysmac Studio Version 1 オペレーションマニュアル SBCA-362

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(b) 高い信頼性が必要な用途 (例: ガス・水道・電気等の供給システム、24時間連続運転システム、決済システムほか権利・財産を取扱う用途など)
(c) 厳しい条件または環境での用途 (例: 屋外に設置する設備、化学的汚染を被る設備、電磁的妨害を被る設備、振動・衝撃を受ける設備など)
(d) カタログ等に記載のない条件や環境での用途
* (a) から (d) に記載されている他、本カタログ等記載の商品は自動車 (二輪車を含む、以下同じ) 向けにはありません。自動車に搭載する用途には利用しないでください。自動車搭載用商品については当社営業担当者にご相談ください。
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オムロン株式会社
インダストリアルオートメーション ビジネスカンパニー

● 製品に関するお問い合わせ先
お客様相談室
フリーダイヤル **0120-919-066**
携帯電話・PHS・IP電話などではご利用いただけませんので、下記の電話番号へおかけください。
電話 **055-982-5015** (通話料がかかります)
■ 営業時間: 8:00~21:00 ■ 営業日: 365日
● FAXやWebページでもお問い合わせいただけます。
FAX 055-982-5051 / www.fa.omron.co.jp
● その他のお問い合わせ
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お断りなく仕様などを変更することがありますのでご了承ください。

Precautions for Compliance with UL/CSA Standards and EU Directives

Notice to Users of the NX series components (NX-V680C1/-V680C2) in USA, Canada and Europe

This manual must be consulted in all cases in order to find out the nature of the potential HAZARDS and any actions which have to be taken to avoid them.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

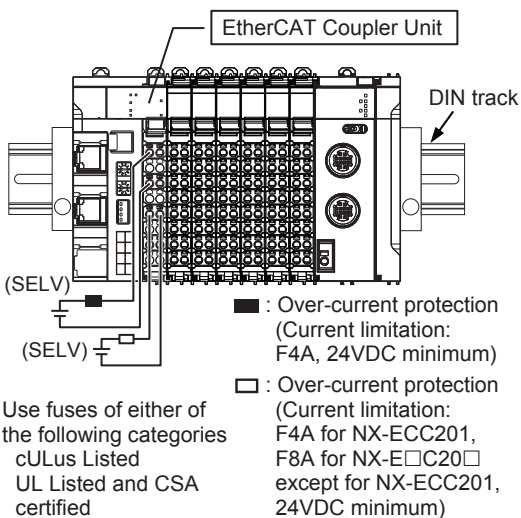
This product is defined as an in-panel device and must be installed within a control panel.

Environment

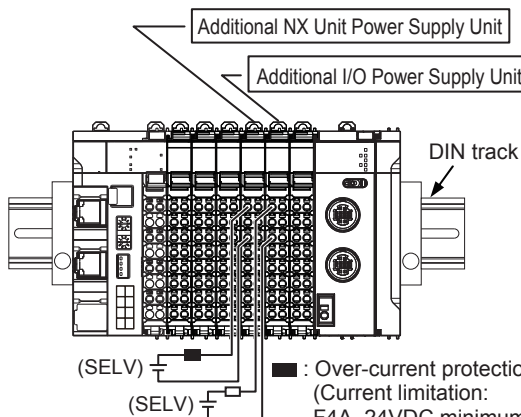
- Surrounding Air Temperature: 0 to 55°C
- Surrounding Air Humidity: 10% to 95%
- Indoor use only
- Altitude: Max. 2,000 m
- Pollution Degree 2

External Power Supply Condition and Current Restriction

The external power supplies must be DC power supplies that satisfy the SELV requirements. It must be equipped with an over-current protection with current limitation.



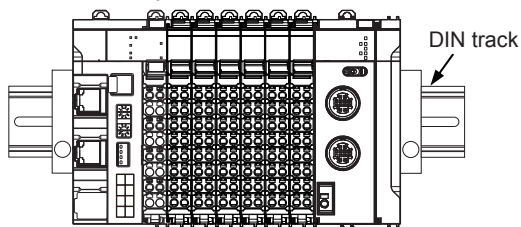
Use fuses of either of the following categories
cULus Listed
UL Listed and CSA certified



Use fuses of either of the following categories
cULus Listed
UL Listed and CSA certified

Direction of installation

Vertical only.



- Cleaning**
Do not use paint thinner or similar chemical to clean with. Use a dry cloth.
- Cable for Ground terminal**
Please select the cable by which rated temperature is 80°C or above.
- Enclosure type**
Please use this product in a control panel.
Enclosure type: Type 1 or more.

Operating Temperature Code
T5

Marking

⏏: Functional Earth Terminal

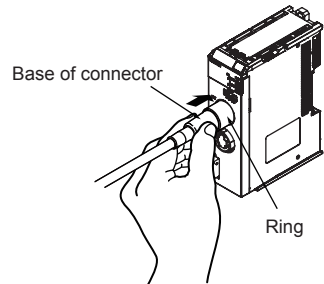
Electrical Ratings

	NX-V680C1	NX-V680C2
Unit power supply	3.63 to 6Vdc (280 to 170 mA),SELV, LIM	3.63 to 6Vdc (280 to 170 mA),SELV, LIM
I/O power supply	20.4 to 28.8Vdc(250 to 200mA),SELV	20.4 to 28.8Vdc(380 to 280mA),SELV
Antenna Output	V680-H01-V2 connection: 12 V, 260 mA, SELV V680-HA63□ connection: 7.5 V, 335 mA, SELV	V680-HA63□ connection: 7.5 V, 670 mA, SELV
Unit Power consumption	Connector to CPU Unit: 1.00W max. Connector to Communications Coupler Unit: 0.90W max.	Connector to CPU Unit: 1.00W max. Connector to Communications Coupler Unit: 0.90W max.
Current consumption from I/O power supply	V680-H01-V2 connection: 250 mA max. V680-HA63□ connection: 210 mA max.	V680-HA63□ connection: 380 mA max.

Mounting method

Connecting the Antenna

- Holding the base of the connector, align the white mark on the Unit with the white mark on the connector and insert the connector.



- Press in on the connector until it locks in place.

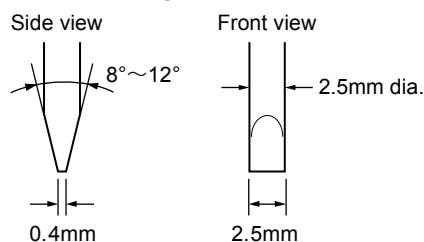
Connectable Antenna and Amplifier

- Antenna unit:
V680-H01-V2 (connecting to NX-V680C1 only)
- Amplifier unit:
V680-HA63A and V680-HA63B

Connecting Strand Wires/Solid Wires

Use a flat-blade screwdriver to connect and remove wires.

Use the following flat-blade screwdriver

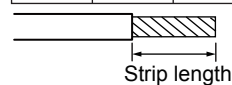


Recommended screwdriver

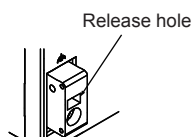
Model	Manufacturer
SZF 0-0,4x2,5	Phoenix Contact

Applicable wire size for Ground terminal

Wire type				Wire size	Strip length
Strand wires		Solid wire			
Plated	Unplated	Plated	Unplated	AWG 24-15	9 to 10 mm
Possible	Possible	Possible	Possible		



Leave the flat-blade screwdriver pressed into the release hole and insert the strand wire or the solid wire into the terminal hole. Insert the strand wire or the solid wire until the stripped portion is no longer visible to prevent shorting.



After you make a connection, make sure that the strand wire or the solid wire is securely connected to the terminal block.

Conformance to UL/CSA Standards

Compliance with Class I Division 2 Hazardous Location:

Input and output wiring must be in accordance with Class I, Div. 2 wiring methods and in accordance with the authority having jurisdiction.

- This equipment is suitable for use in Class I, Div.2, Group A, B, C, D or Non-Hazardous Locations Only.
- WARNING : Explosion Hazard - Do not Disconnect Equipment Unless Power Has Been Switched off or the Area Is Known to Be Non-Hazardous.
- This device is open-type and is required to be installed in an enclosure suitable for the environment and can only be accessed with the use of a tool or key.
- There is a danger of burns if it is used at surround air temperature exceeding 50°C. Do not touch the RFID Unit.

- Cet équipement convient à l'utilisation dans des emplacements de Classe I, Division 2, Groupes A, B, C, D, ou ne convient qu'à l'utilisation dans des endroits non dangereux.
- AVERTISSEMENT : Risque d'explosion Avant de débrancher l'équipement, couper le courant ou s'assurer que l'emplacement est désigné non dangereux.
- Ce dispositif est de type ouvert et doit être installé dans un coffret adapté à l'environnement et auquel on ne pourra accéder uniquement au moyen d'un outil ou d'une cle.
- Il y a un risque de brûlure si elle est utilisée à température air surround supérieure à 50°C. Ne touchez pas l'unité RFID.

Applicable wire size for Unit power source and IO power source terminal

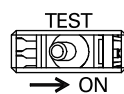
Current limitation	Type	Strip length	Conductor surface
4A max.	Solid/Strand	9mm	Plated
Exceeds 4A	Strand	9mm	Plated

Do not use ferrule terminals. Insert the strand or solid wire directly into the holes on the terminal block. Please select wire size suitable for rated current.

Wire size	Current (MAX)
AWG 24	2A
AWG 22	3A
AWG 20	5A
AWG 18	7A
AWG 16	10A

Operation Modes

An RFID Unit has two operation modes, namely the "Normal mode" and the "Test mode". These operation modes are switched with the help of the test switch provided on the front side of the Unit.



Status	Description
OFF	Normal mode status (factory default state)
ON	Test mode status

Normal Mode

This is an operation mode in which communications with an RF Tag are performed according to the command instructions from a user program by exchanging data with the CPU Unit with the help of I/O refreshing. The RFID Unit can be switched to the normal mode by turning the test switch OFF.

Test Mode

This is a mode in which the RFID Unit autonomously tests (measures the communications distance level) communications with an RF Tag. The RFID Unit can be switched to the test mode by turning the test switch ON.

Conformance to EU Directives

This product is EMC-compliant when assembled in PLC system or Machine Automation Controller. To ensure the EU Directive conformance of customer's machinery or equipment in which the product is incorporated, be sure to observe the following precautions.

- This product is defined as an in-panel device and must be installed within a control panel.
- This product complies with the common emission standard (EN61131-2, EN61000-6-4) with regard to EMI. For the radiated emission requirement (10-m regulations), in particular, please note that the actual emission varies depending on the configuration of the control panel to be used, the connected devices, and wiring methods. Therefore, the customer must confirm the EU Directive conformance of the overall machinery or equipment by themselves, even if this EU conforming product is used.

This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

Conformance to KC Standards

Observe the following precaution if you use NX-series Unit in Korea.

- 이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

This device is conformity evaluated for business use. When used in home, there is a risk of radio interference.

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Note: Specifications are subject to change without notice.