

从站单元/中继器单元 CRT1 系列

安全上的注意事项

感谢您购买本公司的 CRT1 系列 从站单元/中继器单元。
为了安全使用，请务必阅读该说明书和相应模块的参考手册。
有关参考手册，可以与最近的代理商联系并索取最新版的资料。
请妥善保管该说明书与参考用手册，同时请向最终用户寄送此类资料。

- CompoNet 模拟量 I/O 从站 用户手册 (Man.No.SBCD-348□)
- CompoNet 形式 CRT1 系列 用户手册 (Man.No.SBCD-339□)
- CS/CJ 系列 主站单元 用户手册 (Man.No.SBCD-338□)

欧姆龙(上海)有限公司

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安全上的注意事项

●警告/注意表示的意义

警告 如果使用不正确，可能会引起人的轻伤或中度伤害，特殊情况还会引起重伤或死亡。也有可能引起物质方面重大损失。

注意 如果使用不正确，有时会引起轻伤或中度伤害，物品损坏等。

●警告表示

警告

通电时请不要拆解产品，不要接触到接线端子。另外，请在盖板打开的情况下通电，否则有触电危险。

考虑到即使由于可编程控制器（包含 CPU 单元及各单元，下面称作 PC）的故障或 PLC 外部的原因导致出现异常时的系统整体的安全运行，所以请务必在从站单元/中继器单元的外部采取安全措施。
异常动作有引起重大事故的危险。

- （1）请务必与异常停止电路、互锁电路、限制电路等安全保护相关的电路做成从站单元、中继器单元外部的控制电路。
 - （2）当 PLC 通过自诊功能检测出异常时，或是执行运行中止故障诊断（FALS）指令时，要停止运行使所有输出为 OFF。此时，为了使系统在安全的一侧运行，请在从站单元/中继器单元外部采取相应对策。
 - （3）有时由于输出继电器的熔断或烧毁，输出晶体管的损坏等原因会造成从站单元/中继器单元的输出一直停在 ON 或 OFF 状态。此时，为了使系统能在安全的一侧运行，请在从站单元/中继器单元外部采取相应对策。
 - （4）如果从站单元/中继器单元的 DC24V 输出（服务电源）过载或短路时，电压会下降，有时输出会变成 OFF。此时，为了使系统在安全的一侧运行，请在从站单元/中继器单元外部采取相应对策。
- 即使在停止运作的状态下（「程序」模式）、CPU 单元也会进行 I/O 刷新。同时，由于以下的操作、输出单元中分出的输出继电器区域的数据、还有高性能 I/O 单元/CPU 高性能单元中分出的各个继电器区域的数据进行变更的时候，需要在充分确认安全性之后，再进行操作。
操作时必须考虑到输出单元和高性能 I/O 单元/CPU 高性能单元上接续的负荷。
- 利用周边工具（计算机工具）、向 I/O 存储器的 CPU 单元进行传送操作
 - 利用周边工具进行现在值变更操作
 - 利用周边工具、进行强制设定 / 重置操作
 - 存储卡或者 EM 文件存储器向 I/O 存储器文件的 CPU 单元进行传送操作
 - 网络上其他的 PLC 或者上位计算机向 I/O 存储器进行传送的操作。
- 输入到模块的电压/电流请按规定电压/电流范围使用。
一旦使用超出范围外的电压/电流将导致故障或火灾。

安全注意

- 在运输单元的时候、请使用专用包装盒。另外、在运输中请勿施加过度的震动和冲击。
- 请勿使得产品下落、施加异常震动或冲击。这可能导致故障或者运行错误。
- 请确认安装 DIN 导轨、底座、安装工具，或螺丝。
- 从站单元/中继器单元的安装螺丝、电缆的螺丝，请根据参照手册中指定的转矩进行固定。
- 螺丝用参照手册指定的转矩。
- 端子台、通信电缆等具有锁定结构的配件，请确认的锁定之后再使用。
- 安装时请务必进行 D 种接地（第 3 种接地）。
- 请按照参考手册正确连接所有接线。
- 在多个系统中使用专用扁平电缆的时候（没包层，有包层）、为了防止由于干涉所造成的运作部稳定、各 CompoNet 系统的专用扁平电缆束之间、请务必保持 5mm 以上的距离。
- 通信距离以及接续台数请遵照规格范围使用。
- 在配线以及安装时、请注意不要使金属屑落入单元内部。

- 配线时、请使用正确的配线零部件。
- 请使用指定的通信电缆、连接器。
- 配线时请注意端子的极性。
- 请使用参考手册中规定的转矩来固定端子台的螺丝。螺丝可能是引起松弛，起火，动作异常，故障的原因。
请使用参考手册中指定的电源电压。
- 请勿拽拉或弯折电缆超过其允许的限度
- 通信电缆配线时、请注意以下事项。
 - 通信电缆应远离动力线，高压线。
 - 请勿弯折通信电缆。
 - 请勿过度拉伸通信电缆。
 - 请勿在通信电缆上堆装物品。
 - 必须在导管内装配通信电缆。
- 在电源条件恶劣的地方、使用时，请务必保证额定电压和频率的电源供给。
- 请在短路里预设接触断路器等措施给安全对策。
- 如因信号线断开、瞬间停电而产生异常信号时，请使用者采取安全保护措施。
- 在对通信路和电源进行配线以及 I/O 配线时、请注意电压规格。否则会导致故障。
- 请勿在输出单元上施加超过最大开闭能力的电压及负荷。
- 再次运作所必需的数据存储器和保持继电器的内容、参数以及数据、传送到交换后的 CPU 单元、高性能 I/O 单元里之后再启动。
- 作为的用户程序、进行充分的动作确认后、再进行本操作。
- 请充分确认配线和开关设定正确后、再通电。
- 在着手下列任一项工作前，请切断加在 PLC 上的电源，通信用的电源（OFF）
 - 本体（扩展单元）组装时
 - 端子台以及连接器的装卸
 - 部品（继电器等）的更换
 - 设定拨位开关或旋转开关时
 - 连接电缆或电线时
- 请确认对设备没有影响之后再行下列操作。
 - PLC 动作模式的切换
 - 继电器接点的强制设定/重置
 - 用户程序上的设定值或者现在值的变更
 - I/O 测试性能的操作
 - 输出单元的用户校正性能的操作
- 在接触单元前，为使人体所存的静电放电，请务必先接触接地金属物。
- 更换部品（继电器等）的时候、务必在确认规格正确后再更换
- 请不要拆解、修理、改造本产品。
- 旋转开关的设定、配线后，请按照规定的转矩固定盖板的螺丝。当固定不充分的时候，可能无法起到保护作用。（只限于位从站 IP54 防尘·防沫型）
- 在以下场所使用时，请采取屏蔽措施：
 - 有静电或其它形式噪音处
 - 有较强电磁场的场所
 - 可能暴露于射线的场所
 - 靠近于动力电源的场所
- 请勿使用稀释剂进行清洁。请使用市贩的酒精类清洁。

使用注意

- 请遵照参照手册中所示的正确配置。否则可能会导致故障。
- 请勿在下列场所使用：
 - 阳光直射处
 - 周围温度和相对湿度超出规格值范围的场所
 - 温度急剧变化易引起结露的场所
 - 有腐蚀性气体和可燃性气体的场所
 - 尘埃、灰尘、盐分、铁粉较多的场所
 - 会被溅到水、油、药品等飞沫的场所（位从站 IP54 防尘·防沫型除外）
 - 给主机带来直接振动和冲击的场所
- 请确认不要使电缆等无意中碰到输入键。

使用时的承诺事项

在以下条件和环境中使用时，希望向本公司营业部人员咨询并确认规格书，同时对额定功能等要留有余余地地使用以及考虑到安全保险措施，同时寻求即使发生故障，也能将危险控制在最小程度的安全对策。

- 用于室外、有潜在的化学污染、电气辐射以及产品样本或随机说明书中所没有记载的条件和环境中的场合时
- 用于原子能控制、铁路、航空、车辆设备、燃烧装置、医疗器械、娱乐机械、安全机械、行政机关和特殊行业等
- 预计会对人身、财产产生很大影响的系统、机械、装置等
- 用于煤气、水管、电力等提供系统和 24 小时不间断运行系统等高信赖性的设备
- 按照上述 a) ~ d) 的标准，用于对安全性要求高的场所

EU 指令的适用事项

本产品适用于 EU 指令。但是、客户的机器，装置在适用于 EU 装置的同时，需要注意如下事项：

1. 本产品必须安装在控制盘内。
 2. 作为通信电源，内部电源、I/O 电源即使在输入时发生 10ms 的瞬停，也可以保证稳定的输出供给。另外，请使用强化绝缘、二重绝缘体。
推荐 OMRON 产形 S82J 系列的电源。*
 3. 本产品的 EU 指令适用商品、虽然适用于 EMI 相关的 Emission 规格 (EN61131-2、EN61000-6-4)、特别是关于 Radiated emission (10m 规则)、可能会由于使用的控制盘结构，和其他机器接续的关系，以及配线等产生变化。
同时、在使用作为 EU 指令适用产品的本产品时、客户需要确认机械，装置全体对于 EU 指令的适用性。
 4. 对于 I/O 配线不满 30m、电源配线不满 10m 的结构，需要确认其适用性。
* 推荐电源已经确认其 EMC 的规格适用性。
- 本商品为「class A」（工业环境商品）。在住宅环境中使用的话、可能导致信号辐射。此时，需要针对信号辐射采取相应措施。

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Slave Unit/Repeater Unit CRT1 Series

Safety Precautions

Thank you for purchasing an OMRON CRT1-series Slave Unit/Repeater Unit. To ensure safe operation, please be sure to read this document along with the manuals that are listed below. Please be sure you are using the most recent versions of the user manuals. Contact your nearest OMRON representative to obtain manuals. Keep this document and all user manuals in a safe location and be sure that they are readily available to the final user of the products.

- CompoNet Analog I/O Slave (Numerical indicator type) User's Manual (Cat. No. W484)
- CRT1 Series CompoNet Slave Units and Repeater Unit (Cat. No. W457)
- CS1W-CRM21/CJ1W-CRM21 CompoNet Master Units Operation Manual (Cat. No. W456)

OMRON Corporation

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Safety Precautions

☒ Meanings of Signal Words



WARNING

Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.



Caution

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

☒ Warnings



Do not touch the terminal section and do not touch the interior of any Unit while the power is being supplied. In addition, do not turn ON the power supply while the cover is open. Doing any of these may result in electric shock.



Provide safety measures in external devices (i.e., not in the PLC), including the following items, to ensure safety in the system if an abnormality occurs due to malfunction of the PLC or another external factor affecting the PLC operation. ("PLC" includes the CPU Unit, other Units mounted in the PLC, Slave Units, and Repeater Units.) Not doing so may result in serious accidents.

1. Emergency stop circuits, interlock circuits, limit circuits, and similar safe measures must be provided in external circuits (i.e., not in the PLC).
2. The PLC will turn OFF all outputs when its self-diagnosis function detects any error or when a SEVERE FAILURE ALARM (FALS) instruction is executed. As a countermeasure for such errors, external safety measures must be provided to ensure safety in the system.
3. The PLC outputs may remain ON or OFF due to deposits on 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 safety in the system.
4. When the 24-V DC output (service power supply) is overloaded or short-circuited, the voltage may drop and result in the outputs being turned OFF. As a countermeasure for such problems, external safety measures must be provided to ensure safety in the system.



The CPU Unit refreshes I/O even when the program is stopped (i.e., even in PROGRAM mode). Confirm safety thoroughly in advance before changing the status of any part of memory allocated to I/O Units, Special I/O Units, or CPU Bus Units. Any changes to the data allocated to any Unit may result in unexpected operation of the loads connected to the Unit. Any of the following operation may result in changes to memory status.

- Changing present values in memory from a Programming Device.
- Force-setting/-resetting bits from a Programming Device.
- Transferring I/O memory files from a Memory Card or EM file memory to the CPU Unit.
- Transferring I/O memory from a host computer or from another PLC on a network.

Do not apply a voltage or current outside the specified range to the Unit. It may cause a malfunction or fire.

Precautions for Safe Use

When transporting the Unit, use special packing boxes and protect it from being exposed to excessive vibration or impact during transportation.

- Do not drop any Unit or subject any Unit to excessive shock or vibration. Otherwise, Unit failure or malfunction may occur.
- Mount the Units securely using DIN Track, brackets, or screws.
- Make sure that all Slave Unit/Repeater Unit mounting screws and cable screws are tightened to the torque specified in the relevant manuals. Incorrect tightening torque may result in malfunction.
- Make sure that the terminal blocks, communications cables, and other items with locking devices are properly locked into place. Improper locking may result in malfunction.
- When installing the Units, ground to 100 W min.
- Wire all connections correctly according to instructions in the manuals.
- Always separate Flat Cables for different CompoNet lines by at least 5 mm to prevent unstable operation due to interference. Do not bundle Flat Cables.
- Do not extend connection distances or the number of connected nodes beyond the ranges given in the specifications.
- Do not allow foreign matter to enter the Unit.
- Use the correct wiring materials to wire the Units.
- Use the correct wiring tools to wire the Units.
- Always use the specified communications cables and connectors.
- Confirm the polarity of all terminals before wiring them.
- Do not bend cables past their natural bending radius or pull on cables.
- Observe the following precautions when wiring the communications cable.
 - Separate the communications cables from the power lines or high-tension lines.
 - Do not bend the communications cables past their natural bending radius.
 - Do not pull on the communications cables.
 - Do not place heavy objects on top of the communications cables.
 - Always lay communications cable inside ducts.
- Take appropriate measures to ensure that power with the rated voltage and frequency is supplied. Be particularly careful in places where the power supply is unstable. An incorrect power supply may result in malfunction.
- Install external breakers and take other safety measures against short-circuiting in external wiring. Insufficient safety measures against short-circuiting may result in burning.
- Fail-safe measures must be taken by the customer to ensure safety in the event of incorrect, missing, or abnormal signals caused by broken signal lines, momentary power interruptions, or other causes.

- Confirm voltage specifications when wiring communications, the power supply, and I/O crossovers. Incorrect wiring may result in malfunction.
- Do not apply voltages or connect loads to the Output Units in excess of the maximum switching capacity. Excess voltage or loads may result in burning.
- After replacing Units, resume operation only after transferring to the new CPU Unit and Special I/O Units the contents of the DM Area, Holding Area, and other data required for resuming operation. Not doing so may result in an unexpected operation.
- Check the user program for proper execution before actually running it on the PLC. Not checking the program may result in unexpected operation.
- Check all wiring and switch settings to be sure they are correct.
- Always turn OFF the power supply to the PLC and Slave Unit/Repeater Unit before attempting any of the following. Not turning OFF the power supply may result in malfunction or electric shock.
 - Assembling any Units (Expansion Units).
 - Removing or attaching terminal blocks and connectors to a Slave Unit/Repeater Unit.
 - Replacing parts (e.g., relays).
 - Setting DIP switches or rotary switches.
 - Connecting cables or wiring the system.
- Confirm that no adverse effect will occur in the system before attempting any of the following. Not doing so may result in an unexpected operation.
 - Changing the operating mode of the PLC.
 - Setting/resetting any bit in memory.
 - Changing the present value of any word or any set value in memory.
 - Operating the I/O test functions.
 - Operating the user adjustment functions on Output Units.
- Touch a grounded piece of metal to discharge static electricity from your body before touching any Unit.
- When replacing parts (e.g., relays), be sure to confirm that the ratings of the new part are correct. Not doing so may result in malfunction or burning.
- Do not attempt to disassemble, repair, or modify any Units. Any attempt to do so may result in malfunction, fire, or electric shock.
- Tighten the screws on the cover to the specified torque after setting the rotary switches and wiring. Insufficient tightening torque may result in inadequate protection (only for waterproof Bit Slaves).
- Take appropriate and sufficient countermeasures when installing systems in the following locations:
 - 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 supplies.
- Do not use thinner for cleaning. Use commercially available alcohol instead.

Precautions for Correct Use

- The operating environment of the PLC System can have a large effect on the longevity and reliability of the system. Improper operating environments can lead to malfunction, failure, and other unforeseeable problems with the PLC System. Be sure that the operating environment is within the specified conditions at installation and remains within the specified conditions during the life of the system.
- Install and wire the Unit correctly according to instructions in the reference manuals. Improper installation or wiring may result in malfunction.
- Do not operate the control system in the following locations:
 - 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 (excluding waterproof Bit Slaves).
 - Locations subject to exposure to oil, acid, or chemicals (all Units).
 - Locations subject to shock or vibration.
- Prevent cables and other substances from accidentally pressing the input keys.

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to the product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM. See also Product catalog for Warranty and Limitation of Liability.

Conformance to EU Directives

The OMRON products described in this manual comply with the related EMC Directives. To ensure that the machine or device in which the products are used complies with EU Directives, the products must be installed as follows:

1. The products must be installed within a control panel.
 2. A DC power supply with reinforced insulation or double insulation that can maintain a stable output even if the input is interrupted for 10 ms must be used for communications power, internal power, and I/O power. The OMRON S82J-series Power Supply is recommended. (See note.)
 3. Products complying with EU Directives also conform to the Emission Standards (EN 61131-2 and EN 61000-6-4). Radiated emission characteristics (10-m regulations) may vary depending on the configuration of the control panel used, other devices connected to the control panel, wiring, and other conditions. You must therefore confirm that the overall machine or equipment complies with EU Directives.
 4. TRANSLATION: Conformance with EU Directives was confirmed with a system configuration using I/O wiring lengths of less than 30 m and power supply wiring lengths of less than 10 m.
 - Note** Conformance with the EMC Directive was confirmed when using the recommended power supply.
- 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.

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Note: Specifications subject to change without notice.
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