Barcode Verification System LVS/V Series

OMRON

Print quality verification to ISO guarantees readability of barcodes



Today, unreadable barcodes can result in damaging the credibility of products and companies

Traceability is being applied throughout supply chains for product quality control, counterfeit prevention, recall avoidance, and highly efficient logistics. While 1D and 2D codes play a key role in traceability, manufacturers and distributors face the challenge of barcode quality management.

Is your industry facing the challenges of barcode quality control?

Prescription medication and medical device industries



Barcode verifiers must be installed within the time specified by law or regulation, with as little effort as possible. Automotive and automotive parts industries



Finished vehicle manufacturer There is variation in barcode print quality depending on the supplier and material.

Automotive parts manufacturer Customers complain about unreadable barcodes, but the cause cannot be identified.

Solution > P.8

Omron's barcode verification systems provide objective barcode quality verification, preventing unreadable barcodes from escaping

Food and digital parts industries



Retailers make a complaint that barcodes used for authenticity assessment cannot be read.

Logistics and e-commerce



Unreadable barcodes on product management labels require time-consuming confirmation and manual entry of information.

Solution > P.11

Solution > P.10

Verification to international quality standards



Both hardware and software verify barcodes against ISO standards, enabling reliable quality evaluation.

Grading of print quality

You can easily identify defect causes and share target grades with your suppliers.



Grade: 0.0 to 4.0

ISO verification just after printing ensures barcode quality, increasing the credibility of products and companies

Codes are increasingly used at the distribution and consumption levels as well as the manufacturing process. One of the drastic measures to eliminate reading failures across a supply chain is to verify barcode quality to ISO standards immediately after barcode printing and then use the barcodes, which meet the necessary level of quality, from the upstream of the supply chain.



a better quality.

Barcode verification system is a barcode grading tool

Barcode verification systems grade codes by evaluating whether printed barcodes comply with applicable standards. To ensure the accuracy of barcode verification, the standards provide print quality test specifications and verifier conformance specifications. Barcode verification systems must comply with the standards to make absolute judgments if barcodes conform to the relevant standards.

Typical verification standards for barcode print quality ISO/IEC 29158: For 2D DPM ISO/IEC 15415: For 2D codes ISO/IEC 15416: For linear codes



standards.



operations

Improved barcode quality reduces reading failure during picking, increasing productivity.

Omron's barcode verification systems to suit your application



Prescription medication and medical device industries

Meets strict regulations, with nearly 20 years proven track record in Europe and U.S.

Laws and regulations are increasing to prevent counterfeit medicines from entering supply chains and control quality of medical devices

One example is the U.S. Food and Drug Administration's (FDA^{*1}) UDI regulations^{*2}. In order to share information throughout a supply chain, UDI regulations require to apply linear or 2D codes in which product identification information is encoded and to verify barcodes to ISO standards before shipment. Prescription medication and medical device manufacturers and OEMs who ship products to newly regulated countries need to meet UDI regulations (1.5 or higher ISO grade) within a period of grace.



Assuring compliance and reliability in the medical supplies industry

Compliant with ISO/IEC and other international standards

Our barcode verification systems, planned and developed in the U.S. that leads in terms of laws and regulations, meet UDI and other requirements of U.S. and European laws and regulations. We are continuously working to make products conform to upgraded standards by participating in standards organizations. In addition, our long-term product supply offers you peace of mind.

ISO conformance standards

ISO/IEC 15415, 15416, 15426-1, 15426-2, ISO/IEC 29158

21 CFR Part 11 compliant-ready for medical supplies industry

21 CFR Part 11, established by the FDA, is a regulation to prevent falsification of electronic records and electronic signatures. The FDA requires electronically processed records related to development and production, and the whole manufacturing process must conform to Part 11. Our barcode verification systems have the required abilities to meet the requirements.

User Administration (Active Directory compatible)

Login	×
Operator ID:	
Password:	
Reference:	
ок	Cancel

Change this Delete this

Login requires a user ID and password.

Operational permissions can be set for each user.

Audit Trail

LoTime	GmtTime	OperatorID	Message		
25-Jan-2018 14:14	25-Jan-2018 22:14	220	Program started		
25-Jan-2018 14:14	25-Jan-2018 22:14		Database updated to version 4.3.0.3006		
25-Jan-2018 14:14	25-Jan-2018 22:14		Initialized Camera.DefaultSN to 21610890		
25-Jan-2018 14:14	25-Jan-2018 22:14		Initialized Camera.InternalSN to 21610890		
25-Jan-2018 14:15	25-Jan-2018 22:15		GS1 table changed to Table 1 - Trade Items Scanned in General Retail POS and not General Distribution		
25-Jan-2018 14:15	25-Jan-2018 22:15		Application standard changed to GS1 General Specifications		
25-Jan-2018 14:16	25-Jan-2018 22:16		Initialized Database.MultiUserLock to unlocked		
25-Jan-2018 14:16	25-Jan-2018 22:16	LVS	Logged on		
25-Jan-2018 14:16	25-Jan-2018 22:16	LVS	GS1 action changed to Generate warning but don't change grade if Xdim or		

The date and time of user entries and actions are recorded for auditing purposes. The audit trail reports can be stored in a database.

*1. The U.S. Food and Drug Administration (FDA) is the government organization that is responsible for regulating foods and pharmaceuticals in the U.S. *2. Unique Device Identification (UDI) is an identifier to appropriately identify medical devices through distribution and use. UDI is intended to provide internationally accepted medical device identification and coding. In September 2013 the FDA published its final ruling for UDI, and the regulations are spreading in the U.S., European countries, and Asian countries.

*3. Prescription medication and medical device industries.

Used in European and U.S. medical supplies industry*3 for nearly 20 years

Verification of various barcodes used in prescription medication and medical device industries

Supporting linear and 2D codes compliant with standards for medical supplies

In addition to verification of a wide range of linear and 2D codes, the barcode verification system can read and verify multiple barcodes simultaneously.

Typical available symbologies

For prescription medications

(01)04912345678904

GS1 DataBar Limited

(01)04912345678904 GS1 DataBar Stacked



GS1-128

For medical devices and vitro diagnostic medications



GS1-128



Easy 3-step verification

The pre-installed menu facilitates adjustment of verification conditions for individual barcodes and calibration. You can verify barcodes in just three steps. The easy-to-use user interface allows on-site operators to operate the system easily and quickly. 1. Select verification standard



3. Perform grading



In-line inspection of every barcode printed on labels V275 Series

The V275 Series is a label printer with an integrated barcode verifier, automatically inspecting 100% of printed labels for print quality without a separate barcode verifier. It also has blemish detection, optical character recognition (OCR), and optical character verification (OCV) capabilities as well as barcode print quality verification.



Verifies barcodes just after printing

barcode verifier



Reads and verifies multiple barcodes simultaneously

Automotive and automotive parts industries Maintains barcode quality to meet customer requirements

As EV parts are distributed globally, readability of barcodes is becoming more crucial

The shift to EVs increases items managed by finished vehicle manufacturers. In the entire supply chains, the global manufacturing and distribution of EV parts is growing more than ever before.

This raises the importance of reliably reading barcodes at every process in parts suppliers, assembly manufacturers, and finished vehicle manufacturers. To ensure reliable barcode reading in the entire supply chains, finished vehicle manufacturers require print verification, and parts suppliers and assembly manufacturers independently verify barcodes to demonstrate their reliability to finished vehicle manufacturers around the world.





Ensure barcode quality in entire supply chains

With our barcode verification systems compliant with ISO and other international standards, parts suppliers and assembly manufacturers can objectively check barcode quality, preventing low-quality barcodes from reaching the market before shipment. Then assembly manufacturers and finished vehicle manufacturers also check barcode quality with the barcode verification systems when receiving parts. This prevents reading failure and ensures print quality in the entire supply chain.



Print quality verification using our international standard-compliant barcode verification systems benefits all companies involved.

Deliverer

- Ships products that meet the required barcode print quality standards.
- Gains customer confidence by outputting reports of barcode print quality verification results

Overall: 4.	0/08/66	0/0	
		0.	A Code susses
operator sign	ature	in all	00417 racests
and the state of t	ENITE .	-	
ecced signa			
accend signal		004	er information
20 Local digital	19.500	atter Dash	er information E
20 Linealing: Table Lor	10 Car 11	after Gala	ar toharmation
20 Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Printings Pri	(9.500 11 10 102 00	000 atter Conto Tamento Tamento Apple plane dandard	ar tohurmaktar R St Selow (14) teresenerity DOUTS (14) V(34)
20 Line Line Line Line Line Line	10.000 11 10.000 (0.000)	other Galacian Sector Galacian Sector Sector (ar Colomation Pi Ti admit (11 Internation) International Colomation International Colomation
ecced dipta 20 mining mining mining di teo teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teologi teo	(4.14) 14 14 14 14 14 14 14 14 14 14 14 14 14	Other Later Dash Sametic Damatic Asyltation deviced Later Ashar	a of termstation N N(1) N(1)(1) (N(1))(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)
20 mininge mininge mininge mininge mininge mininge mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger mininger minin	(A. (an) 14 14 (an) (A 14 (an) 14 (an) 14 (an) 14 (an) 14 (an) 14 (an) 14 (an)	Other Land Count County Netherland County Land Addee	er telermeller A Si bereiter (PR servererer) NOPC (1413)(544) bereiter server bit server bit genet 7200 in a serbet bit genet 7200 in a serbet bit
econo digita 20 Ionining mon Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini Marini M	(A. 100) 14 14 15 100 14 15 100 14 15 100 14 15 15 15 15 15 15 15 15 15 15 15 15 15	095 arter Cash Taorita Taorita Australian danlari Taorita danlari Discha quarteri	er telemaster N. 10(97), 1019(1000) Norresponses Norresponses Norresponses Norresponses Norresponses Norresponses Norresponses Norresponses Norresponses Norresponses Norresponses Norresponses Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norresponse Norre
20 Second Spin Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second Second S	9.10 11 11 11 11 11 11 11 11 11 11 11 11 1	000 Later Code Taxanto Taxanto Antherita daster Taxing Code Taxing	Communitient A T Over the second s

Example: HTML format report

Recipient

- Checks barcode quality when receiving parts
- Quantitatively requests suppliers to improve quality



Displays results for individual verification items

Verify various barcodes, ranging from barcodes on labels to DPM

Increase in traceable parts requires verification of a range of barcodes. The LVS Series reliably verify a broad variety of barcodes including codes printed on labels and DPM barcodes.

Reduce reading failure by verifying DPM

The LVS-9585 Barcode Verification System for DPM can verify 2D codes directly marked on metal and PCBs. Featuring a 5 Mpix camera, the LVS-9585 Series reads and analyzes barcodes down to 0.15 mm (0.05 mm for the LVS-9585-DPM-HD). Ensuring consistent print quality between factories mitigates reading errors. Also, parts can be traced quickly in case of a recall.



Difference between grading by standard barcode readers and verification by barcode verification systems

Some barcode readers provide grading of the print quality of barcodes they scan. However, barcode readers that do not comply with the standards for verification can only perform relative evaluation, the results of which depend on the distance from the object and lighting conditions. Barcode verification systems can carry out highly reproducible verification in ISO-compliant conditions (installation distance and lighting). Absolute evaluation according to ISO standards allows the verification results to be used as evidence of the quality verification.

	Illumination	Calibration	Verification algorithm
Barcode verification system	Compliant with ISO standards	Compliant with ISO standards	Compliant with ISO standards
Barcode reader (grading)	Manufacturer-specified	None	Compliant with ISO standards

Improve quality by identifying causes of print defects

Our barcode verification systems can analyze barcodes, helping improve barcode print quality based on analysis results. You can quickly increase yield by enhancing barcode quality.

Example of a print defect: A barcode is partially damaged. (Possible cause: Blemishes such as oil stains and dust on the barcode)

Error details can be checked

In this example, the yellow cells (inside the white frame) indicate defective light cells recognized as dark cells, or vice versa.





Verification standard: ISO/IEC 29158

Error item

Food and digital parts industries

Ensures reliable barcode reading, supporting authenticity assessment

Reliable barcode reading in supply chains is key to solving the issue of counterfeits entering the market

In recent years there has been concern that imitations of expensive products are coming onto the market. Food and beverage that affect people's health directly are especially critical. To address such concern, authenticity assessment systems, which print barcodes containing a serial number on genuine products, are increasingly built. Ensuring barcode print quality before shipment is vital to reliable operation of these systems.



Verify print quality of barcodes for authenticity assessment before shipment

Unreadable barcodes for authenticity assessment may result in costly complaint handling and disposal, plus damage the labeled product's perceived quality. Our barcode verification systems verify barcodes before dispatch from factories, preventing low quality barcodes from entering the market and avoiding barcode reading failure.



Logistics and e-commerce

Makes logistics operations more efficient by verifying barcodes

Poorly printed barcodes hinder improving operational efficiency of logistics

Many people are working to move, store, manage, and ship goods in warehouses. However, against a backdrop of labor shortages and worsening working environments, warehouses are under urgent pressure to streamline operations and improve environments. To tackle this challenge, they are using barcodes to increase operational efficiency, but facing another problem of reading failure to overcome.



Improve operational efficiency by preventing reading failure

If barcodes on labels cannot be read during product picking in a warehouse, workers need to check product information and manually enter data. This compromises the operational efficiency. Print quality verification with our barcode verification systems before factory shipment boosts work efficiency by eliminating unreadable barcodes.



Terms and Conditions Agreement

Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.

- (a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.
- (b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See http://www.omron.com/global/ or contact your Omron representative for published information.

Limitation on Liability; Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of 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.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.