SIMATIC code reading systems

Reading and verification of 1D/2D codes / text and object recognition

SIMATIC Ident

Answers for industry.
Identification systems assist companies in keeping their positions in ever more dynamic markets: The automatic data acquisition by means of RFID or 1D/2D codes makes it possible to meet the constantly increasing requirements for production control, material flow control, asset management, tracking & tracing, and supply chain management. Siemens offers the key technology for this.

As the world’s leading provider of identification systems, Siemens offers the comprehensive SIMATIC Ident range of RFID and code reading systems – from a single source. The focus is on simple system integration at the automation and IT levels and technology-neutral application consulting.

Identification systems: RFID and optical codes

Whether data matrix codes (DMC) or radio frequency identification (RFID): Both marking or detection systems make a lasting impression with their high data security. They have proven their worth even in harsh industrial environments and meet the increasing demand for seamless tracking and tracing of products and processes. At the same time they save both time and effort compared to manual marking and detection methods.

SIMATIC code reading systems

For problem-free reading and verification of 1D/2D codes, for optical character recognition (OCR) and for object recognition Siemens offers both stationary reading systems and handheld readers.

Highlights

- Complete, scalable portfolio of powerful stationary code reading systems
- Simple integration into SIMATIC automation environment
- Choice of communication and connection options
- Verification of 1D/2D codes according to open standards – even in active production
- Optical character recognition
- Object recognition

Stationary code reading systems

The stationary code reading systems read various two-dimensional (2D) codes as well as one-dimensional (1D) barcodes. Some readers also offer a marking quality checking (verification) function for process control, and the OCR or object recognition function. All devices can be easily and flexibly integrated into the automation system thanks to standardized, industry-compatible interfaces and function blocks.

Handheld reading systems

These handheld systems are flexible read devices for two-dimensional (2D) data matrix codes and/or one-dimensional barcodes (1D). The devices can communicate with a host computer via RS232 and USB interfaces and by means of Bluetooth.
Marking – Verifying – Reading – Communication (MVRC)

Four key elements are required for implementing DPM traceability applications: Marking, Verification, Reading and Communication – MVRC. For all these key elements, Siemens offers corresponding products, systems and support for creating the application.

Marking
Marking a product is normally done very early on in the production process so that all following steps can be controlled using the product identity. In most cases, Direct Part Marking (DPM) is used.

Verification
By using verification systems, marking legibility is guaranteed throughout the entire production process, regardless of any possible contamination or whether different readers are used. Moreover, the marking can continue to be read after the production process throughout the lifespan of the product and at a cross-company level.

For example, the SIMATIC MV440 provides DPM verification options for monitoring the marking quality in real time. Measuring the code quality generates cost advantages by optimizing the cycle times in the marking process, preventing plant standstills and avoiding additional handling work.

Reading
Reading during production processes or when servicing requires maximum reliability of the code reading systems. Convenient algorithms provide the SIMATIC MV420/MV440 code reading systems with maximum reading reliability as well as simple handling during parameterization and setup.

Communication
For communication between the reader and process controller, the readers are equipped as standard with interfaces such as PROFINET, Ethernet, and RS232, as well as extended digital inputs and outputs. In addition, the SIMATIC MV420/MV440 devices can use the RFID communication modules (ASMs). This ensures fast and secure transmission of the trigger signal at the start of the read process, as well as rapid and reliable transmission of the reading result.

MVRC means:
- Marking: Applying the coding directly to the object (DPM)
- Verifying: Checking the quality of the markings on the object
- Identifying (reading): Reading during production or servicing
- Communication: Visualization and interpretation of the reading results

What is Direct Part Marking (DPM)?
Direct Part Marking (DPM) denotes the application of a marking directly on the surface of a product without the use of a separate carrier material such as an adhesive label. This makes it possible to identify products in production and trace them after delivery as well. For a number of years, 2D codes have provided a coding method that meets these user requirements.

2D codes consist of easy to implement, dot-shaped basic elements. Laser and dot-peening technologies are outstanding regarding durability, marking speed and lack of material dependency. Because they make use of mechanical deformation, 2D codes can still be read using 2D readers after multiple processing steps on metallic work pieces, for example. 2D codes also provide the advantage of being able to encode data in more limited spaces than comparable barcodes or text.
Stationary code reading systems

SIMATIC MV420/MV440

The stationary SIMATIC MV420/MV440 1D/2D code reading systems impress customers with high reading reliability and speed and a wide range of different communication and connection possibilities. They can read both standard, high-contrast codes as well as difficult-to-read DPM codes applied straight onto the product – even under difficult environmental conditions in industrial applications.

The "Text-Genius" 1) and "Text-Genius Plus" 3) OCR licenses add optical character recognition (OCR) functionality to SIMATIC MV440.

The "Veri-Genius" verification license means that the SIMATIC MV440 can also be deployed to check the marking quality of codes2).

And the "Pat-Genius" object recognition license can be used for checking definable structures in the image. 5)

Flexible lighting options and compact size with degree of protection IP67 allow the MV420 and MV440 to be used in a wide range of industrial applications, for example, in the automotive, packaging, pharmaceuticals, tobacco, cosmetics and electronics industries, as well as in the food and beverages sector.

<table>
<thead>
<tr>
<th>Variant</th>
<th>MV420 SR-B</th>
<th>MV420 SR-P</th>
<th>MV440 SR</th>
<th>MV440 HR</th>
<th>MV440 UR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>752 x 480 pixels</td>
<td>752 x 480 pixels</td>
<td>640 x 480 pixels</td>
<td>1024 x 768 pixels</td>
<td>1600 x 1200 pixels</td>
</tr>
<tr>
<td>Read operations per second (max.)</td>
<td>29</td>
<td>70</td>
<td>80</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>OCR text recognition</td>
<td>via license</td>
<td>via license</td>
<td>via license</td>
<td>via license</td>
<td>via license</td>
</tr>
<tr>
<td>Verification</td>
<td>via license</td>
<td>via license</td>
<td>via license</td>
<td>via license</td>
<td>via license</td>
</tr>
<tr>
<td>Object recognition</td>
<td>via license</td>
<td>via license</td>
<td>via license</td>
<td>via license</td>
<td>via license</td>
</tr>
<tr>
<td>Code quality evaluation</td>
<td>Uncalibrated</td>
<td>Uncalibrated</td>
<td>Calibrated</td>
<td>Calibrated</td>
<td>Calibrated</td>
</tr>
<tr>
<td>AutoTrigger</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Multi-code reading</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>ID-Genius algorithm 4)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

1) Executable on SIMATIC MV440 from Firmware V3.0
2) Executable on SIMATIC MV440 from Firmware V4.0
3) Executable on SIMATIC MV440 from Firmware V5.0
4) The ID-Genius algorithm is mainly used for reading DPM codes under difficult environmental conditions, e.g. in the case of dot-peened codes.
5) Executable on SIMATIC MV440 from Firmware V6.0
The SIMATIC MV420 code reading system supplements the portfolio of basic, compact and integrated code readers. The MV420 is particularly suitable for close-up to mid-range reading distances (approx. 10 mm to 400 mm). The MV420 has been specifically designed for detecting and evaluating a variety of machine-readable 1D/2D codes in the packaging industry (e.g. F&B, pharmaceuticals, and tobacco) and industrial production (e.g. automotive, electronics, and solar panel manufacturing).

The list of readable codes includes all standard matrix codes and barcodes which are reliably detected – largely independent of the printing technology and carrier medium used. One of the main functions of the device is data matrix code (DMC) reading. The SIMATIC MV420 device family is flexible, reliable and easy to use.

**SIMATIC MV420**

**SIMATIC MV440**

The SIMATIC MV440 optical code reading system has been designed for detecting and evaluating a variety of machine-readable 1D/2D codes and for OCR in industrial production for close-up to long-range reading distances (approx. 70 mm to 3000 mm). It is characterized by maximum reading reliability and speed, and by flexible process connection. The product is rugged, has a high protection class, and is easy to operate.

Codes can therefore be reliably detected for almost all types of marking, including Direct Part Marking (DPM), on the most diverse carrier materials. MV440 code readers verify the quality of codes according to commonly applied standards. They determine the quality of the applied code, thus allowing the quality of the marking process to be checked.

**Highlights**

- Various device variants and accessories
  - Basic model and high-performance model with enhanced functions
  - Flexible, powerful, and integrated red, white, and infrared lighting
  - Flexible optics thanks to freely-selectable 6 and 16 mm lenses with a reading distance up to 400 mm
- High reading speed
- Interfaces
  - PROFINET (incl. FB), Ethernet or RS232
  - PROFIBUS DP via communication module
  - Mixed mode is possible with RFID and MV420 on the same communication module
- Functionality of the user interface
  - Commissioning using adjustment support on the PG/PC with Internet Explorer installed
  - Web-based user interface
- Expanded functionality (MV420 SR-P):
  - Multi-code reading (simultaneous reading of up to 50 codes in the field of view)
  - AutoTrigger: Image recording without external triggers
  - ID-Genius algorithm: Reading of low-contrast DPM codes (e.g. dot-peening)
  - Up to 14 code types can be stored

**Highlights**

- Various device variants and accessories
  - Resolutions 640 x 480, 1024 x 768, 1600 x 1200 pixels
  - Connection of external lighting
  - Flexible, powerful, and integrated red, white and green lighting
  - Flexible optics thanks to powerful C-mount lenses
- Optional: Licenses for the verification of the marking quality of codes, for optical character recognition and for object recognition
- High reading speed
- Interfaces
  - Ethernet (PoE), PROFINET (PoE), RS232, DI/DO
  - PROFIBUS DP via communication module
  - Mixed mode is possible with RFID and MV440 on the same communication module
- Functionality of the user interface
  - Commissioning using adjustment support on the PG/PC with Internet Explorer installed
  - Web-based user interface
- Expanded functionality
  - Multi-code reading (simultaneous reading of up to 150 codes in the field of view)
  - AutoTrigger: Image recording without external triggers
  - ID-Genius algorithm: Reading of low-contrast DPM codes (e.g. dot-peening)
Stationary code reading systems
SIMATIC MV420/MV440: Functionality overview

In addition to the functions for reading and decoding code, SIMATIC MV420/MV440 feature numerous functions for easier image capture, commissioning, operation and monitoring, as well as diagnostics and logging of the read results.

Auto trigger
With the auto trigger, codes that enter the field of vision of the reader are automatically read. The reader itself searches a sequence of images over any preferred time span for code visibility. In this case, no external trigger signals, e.g., from a light barrier, are required. This option is particularly useful for objects for which accurate triggering via a light barrier is difficult.

Multi-code reading
In multi-code reading, up to 150 codes can be decoded for each image capture, e.g., when several objects are bulk-read in a single stack. The codes in an image to be read may be of different types.

Verification
High quality marking must be used if maximum reading reliability is to be achieved despite pollution in the production process. Verification also reduces production costs, because the demands on material quality and marking quality are not as stringent. The "Veri-Genius" verification license means that the SIMATIC MV440 can also be deployed to check the marking quality of codes. The license is activated via the SIMATIC Automation License Manager.

Object recognition
With the "Pat Genius" object recognition license, SIMATIC MV440 can also be used for object recognition (object classification, position detection, checking for presence and completeness, etc.) in addition to the reading of 1D and 2D codes. In addition, the functionality is possible in combination with text recognition, for example, thus enabling position control of a label and control of the labeling (reading and comparison) of plain text in an image field. Object recognition is used for finding and recognizing trained patterns in the picture. Object recognition is used in pick & place applications, in production quality control, for position recording in feeder systems or in quantity monitoring for feeder systems and production. The license is activated via the SIMATIC Automation License Manager.

For early detection of deterioration, it may be appropriate to check the readability at every reading position in the production process and not only immediately after marking.

Code quality evaluation
Uncalibrated or calibrated quality evaluation is integrated depending on the model. The uncalibrated method helps with secure setup of the reader and can continuously monitor the code quality. The calibrated method also enables comparison of the quality values over a host of readers (e.g., company-wide, worldwide, and throughout the entire supplier chain).

Start-up
For most applications, the parameter settings are made automatically. If changes nevertheless become necessary, parameters can be set using the integrated Web server and an Internet browser without prior software installation.

Web-based user interface
The user interface of the reader uses the PC Microsoft Internet Explorer. The user interface is stored on the reader. It is downloaded on startup and executed in the Internet Explorer. There is no need to install software on the PC. The user interface can be started from any PC or other Windows-based devices, and it is possible to switch at any time between 6 languages (English, French, German, Italian, Spanish and Chinese simplified).

Visualization
Apart from the web-based user interface, pre-existing HMI units in the plant can be used to display the image information. In the case of a decoding error, it is extremely helpful if the user can read the image information directly on the HMI unit. The programmer can create a customized user interface as an integral component of the user interface for a machine using professional software such as SIMATIC WinCC and WinCC flexible.

Diagnostics and logging
The diagnostics and logging functions support, for example, the transfer of time stamps, fault patterns and results to database systems, for example, or a file system for generating trend analyses or statistics.
SIMATIC MV440: Text recognition (OCR)

Text recognition (OCR) with "Text-Genius" and "Text-Genius Plus"

With the "Text-Genius" and "Text-Genius Plus" licenses, SIMATIC MV440 can also be used for text recognition in addition to reading 1D barcodes and 2D matrix codes. This is also known as optical character recognition (OCR). It is also possible to read and compare plain text and machine-readable codes in the same image field. The text recognition function can be implemented in applications without the need to consider the type of font used for marking (Polyfont) or the marking method.

The licenses are supplied as a "Single License" on a USB stick and can be copied to the device – as well as to already existing or replacement devices – with the SIMATIC Automation License Manager (ALM) using a plug-in. The "Text-Genius" license is executable on a SIMATIC MV440 from Firmware version 3.0, while the "Text-Genius Plus" license can be used from Firmware version 5.0.

Text-Genius

The "Text-Genius" OCR license permits flexible reading of many different fonts without complex learning procedures.

To achieve stable read results for text recognition, it is only necessary to set a few, simple parameters.

The following fonts are particularly suitable:
- OCR-A and OCR-B
- Semifont M13
- Arial and similar fonts
- The entire ASCII character set

Text-Genius Plus

The "Text-Genius Plus" license comprises all functions of the "Text-Genius" license and additionally enables training of further fonts and characters, including special characters and graphic symbols.

Particularly worth mentioning is the simple and self-explanatory character training using thumbnails. Minimum training requirements only result from the convenient algorithms provided by "Text-Genius". It is only necessary to train characters with a poor recognition rate or print images which can change greatly.

This makes it possible to achieve the greatest possible flexibility along with a particularly high detection rate.

Highlights

- Fast and reliable reading (up to 1000 reads per minute) for high-speed applications
- Simultaneous reading and comparing of plain text and machine-readable codes in the same image field
- Automatic text localization without the use of predefined areas means that text can be read even when its position varies
- Automatic line detection for max. five freely definable image regions with max. 15 lines each
- Automatic character height recognition between 15 and 55 pixels
- Individual parameter settings can be stored for a maximum of five freely definable image regions
- Reading of mirrored, rotated and inverted text
- Filter and comparison functions are available for programming by experts
- Flexible retrofitting of the text recognition function via the SIMATIC Automation License Manager
- Simple integration in the automation environment, e.g. via function block of the SIMATIC MV440 devices
Stationary code reading systems

SIMATIC MV420/MV440: Technology overview

<table>
<thead>
<tr>
<th>Stationary code reading systems</th>
<th>MV420</th>
<th>MV440</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Compact IP67 unit with integrated lens protection</td>
<td>Compact IP67 unit with removable protective lens enclosure</td>
</tr>
<tr>
<td>Optical resolution</td>
<td>752 x 480 pixels</td>
<td>640 x 480 pixels, 1024 x 768 pixels or 1600 x 1200 pixels</td>
</tr>
<tr>
<td>Field of view (W x H in mm)</td>
<td>Variable field of view Reading distance depends on selected lens</td>
<td>Variable field of view Reading distance and sensor resolution is dependent on:</td>
</tr>
<tr>
<td></td>
<td>Operating distance1)</td>
<td>With integrated lighting: from approx. 10 mm to 400 mm</td>
</tr>
<tr>
<td></td>
<td>Minimum element size</td>
<td>Depends on reading distance</td>
</tr>
<tr>
<td>Speed</td>
<td>MV420 SR-B: Up to 29 read operations per second; up to 4 code types can be stored MV420 SR-P: Up to 70 read operations per second; up to 14 code types can be stored</td>
<td>Up to 80 read operations per second; up to 14 code types can be stored</td>
</tr>
<tr>
<td>Decoding capability</td>
<td>2D codes2): DMC, PDF417, QR</td>
<td>1D codes: Int. 2/5 (without checksum), Int. 2/5+CS (with checksum), Code 128, Code 39 (without checksum), Code 39+CS (with checksum), EAN 13, EAN 8, UPC-A, UPC-E, UPC Suppl., GS1 Databar 14, GS1 Databar Stacked, GS1 Databar Limited, GS1 Databar Expanded, Pharmacode, POSTNET, Code 93, Codebar, Code 32, OCR</td>
</tr>
<tr>
<td>Interfaces</td>
<td>PROFIBUS DP (via communication module); PROFINET (onboard, MV440 with PoE and via communication module); Ethernet (onboard, MV440 with PoE and via communication module), RS232 (onboard), RS422/TTY (by means of converter)</td>
<td></td>
</tr>
<tr>
<td>Digital I/O</td>
<td>2 customizable digital outputs High-speed trigger input Image-synchronous flash output</td>
<td>4 parameterizable digital I/Os High-speed trigger input Image-synchronous flash output</td>
</tr>
<tr>
<td>General data</td>
<td>Power supply</td>
<td>24 V DC</td>
</tr>
<tr>
<td></td>
<td>Operating temperature</td>
<td>0 ... 50 °C</td>
</tr>
<tr>
<td></td>
<td>Storage temperature</td>
<td>-30 °C ... +70 °C</td>
</tr>
<tr>
<td></td>
<td>Humidity</td>
<td>Max. 95% at 25 °C, no condensation</td>
</tr>
</tbody>
</table>

1) Operating distance measured from last physical element to the component
2) The following are not supported: Micro QR-Code, Macro QR-Code, Truncated PDF417, Macro PDF417, Micro PDF417
The following communication possibilities are available for connecting SIMATIC MV420/MV440 code reading systems to the automation or IT level:

- Direct connection to PROFINET (over FB79)
- Direct connection to Ethernet (TCP/IP native)
- Direct serial connection via RS232 or with interface converter to RS422
- Connection to PROFIBUS and PROFINET, TCP/IP-XML via communication modules. A code reader and RFID read-write device can also be combined on the same communication module.

Convenient function blocks are available for uniform integration in STEP 7.

The Web-based user interface permits simple parameterization and monitoring without additional installation requirements.
Handheld reading systems
SIMATIC MV320, MV325, and MV340

These handheld reading systems are powerful, intelligent reading devices for various two-dimensional (2D) codes as well as one-dimensional barcodes (1D). The integrated complex image processing functions and illumination technologies permit codes to be read on different surfaces. Code readers of different performance classes are available for this purpose.

SIMATIC MV320

The SIMATIC MV320 is the entry-level device and is suitable for labels with high contrast, but can also be used in specific applications for codes with low contrast. The twin-lens system ensures better reading results and mechanical stability. The reader is designed for a reading distance of up to 375 mm. The SIMATIC MV320 handheld reader is suitable for wired communication. Thanks to the varied interface technology (USB, RS232), simple integration into your application is possible with the device.

SIMATIC MV325

The SIMATIC MV325 handheld readers are powerful readers with Bluetooth wireless communication. The readers are suitable for labels with higher contrasts, but they can also be used for labels with lower contrasts on an application-specific basis. The twin-lens system ensures better reading results and mechanical stability. The readers are designed for a distance of up to 375 mm.

The charging station of the SIMATIC MV325 handheld reader can communicate with the host computer by means of USB. No special software is required for this purpose. The SIMATIC MV325 handheld reader itself communicates via Bluetooth with the base station. The code contents read are automatically transferred to the charging station as soon as a wireless connection is established. If there is no connection to the charging station, the read results are cached in the mobile part. This operating mode is referred to as “batch mode.” As soon as the connection to the charging station is restored, the read results are automatically transferred.

SIMATIC MV340

The SIMATIC MV340 is the most powerful device and is particularly suitable for demanding applications such as low-contrast and damaged codes. It has a high reading rate when decoding data matrix symbols.

The special integrated lighting works equally well on smooth, reflective, or wavy surfaces. The MV340 can be connected via RS232 or USB. The device is designed for close ranges and records codes at a distance of up to 50 mm.

Highlights
- High-performance even with difficult-to-read codes
- Large reading ranges
- High reading speed
- Suitable for use in industry thanks to its rugged and ergonomic design
- Configuration by scanning supplied data matrix codes
# Technology overview

<table>
<thead>
<tr>
<th><strong>Handheld readers</strong></th>
<th><strong>SIMATIC MV320</strong></th>
<th><strong>SIMATIC MV325</strong></th>
<th><strong>SIMATIC MV340</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphic display</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Read quality of low-contrast codes</td>
<td>+</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Operating distance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum (code-dependent)</td>
<td>50 mm (1.9&quot;)</td>
<td>50 mm (1.9&quot;)</td>
<td>0 mm (0.0&quot;)</td>
</tr>
<tr>
<td>Maximum (code-dependent)</td>
<td>375 mm (14.8&quot;)</td>
<td>375 mm (14.8&quot;)</td>
<td>50 mm (2.0&quot;)</td>
</tr>
<tr>
<td><strong>Field of view</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Near</td>
<td>25 mm x 15 mm (0.98” x 0.6&quot;) at 50 mm (1.9&quot;) distance</td>
<td>25 mm x 15 mm (0.98” x 0.6&quot;) at 50 mm (1.9&quot;) distance</td>
<td>36 mm x 29 mm (1.4” x 1.1&quot;) at 0 mm (0.0&quot;) distance</td>
</tr>
<tr>
<td>Distant</td>
<td>150 mm x 90 mm (5.9” x 3.5&quot;) at 50 mm (1.9&quot;) distance</td>
<td>150 mm x 90 mm (5.9” x 3.5&quot;) at 375 mm (14.8&quot;) distance</td>
<td>71 mm x 57 mm (2.8” x 2.2&quot;) at 50 mm (2.0&quot;) distance</td>
</tr>
<tr>
<td><strong>Decoding capability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stacked 1D: GS1 Composite (CC-A/CC-B/CC-C), MicroPDF, PDF417</td>
<td>Stacked 1D: GS1 Composite (CC-A/CC-B/CC-C), MicroPDF, PDF417</td>
<td>2D codes: Data Matrix, QR Code, MicroQR Code, GS1 Databar, Aztec</td>
<td></td>
</tr>
<tr>
<td>2D codes: Aztec Code, Data Matrix, Micro QR Code, QR Code, Han Xin</td>
<td>2D codes: Aztec Code, Data Matrix, Micro QR Code, QR Code, Han Xin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department of Defense Unique Identifier String Validator</td>
<td>–</td>
<td>–</td>
<td>•</td>
</tr>
<tr>
<td>Code creation</td>
<td>Print, laser</td>
<td>Print, laser</td>
<td>Laser, print, dot peen</td>
</tr>
<tr>
<td>Wireless interfaces</td>
<td>–</td>
<td>Bluetooth</td>
<td>–</td>
</tr>
<tr>
<td>Interfaces</td>
<td>USB, RS232</td>
<td>USB</td>
<td>USB, RS232</td>
</tr>
</tbody>
</table>

**Permissible ambient conditions**

- Operating temperature: -20 °C ... +55 °C
- Storage temperature: -20 °C ... +65 °C
- Humidity: 5% ... 95%, no condensation

Max. 95% at 25°C, no condensation
Further information

SIMATIC code reading systems:
www.siemens.com/codereader

Industrial identification with SIMATIC Ident:
www.siemens.com/ident

Industry Mall for electronic ordering:
www.siemens.com/industrymall

SIMATIC contacts:
www.siemens.com/automation/partner

Service & Support portal:
www.siemens.com/automation/service&support

Training for SIMATIC Ident:
www.sitrain.com

Newsletter for SIMATIC Ident and Totally Integrated Automation:
www.siemens.com/automation/newsletter

Information material available for downloading:
www.siemens.com/simatic/printmaterial

Partner for your automation solutions
Siemens Automation Solution Partners:
www.siemens.com/automation/solutionpartner

Industrial security
Siemens provides automation and drive products with industrial security functions that support the secure operation of plants or machines. They are an important component in a holistic industrial security concept. With this in mind, our products undergo continuous development. We therefore recommend that you keep informed about updates to our products. Please find further information and newsletters on this subject at:
http://support.automation.siemens.com

To ensure the secure operation of a plant or machine it is also necessary to take suitable preventive action (e.g. cell protection concept) and to integrate the automation and drive components into a state-of-the-art holistic industrial security concept for the entire plant or machine. Any third-party products that may be in use must also be taken into account. Please find further information at:
http://www.siemens.com/industrialsecurity

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