



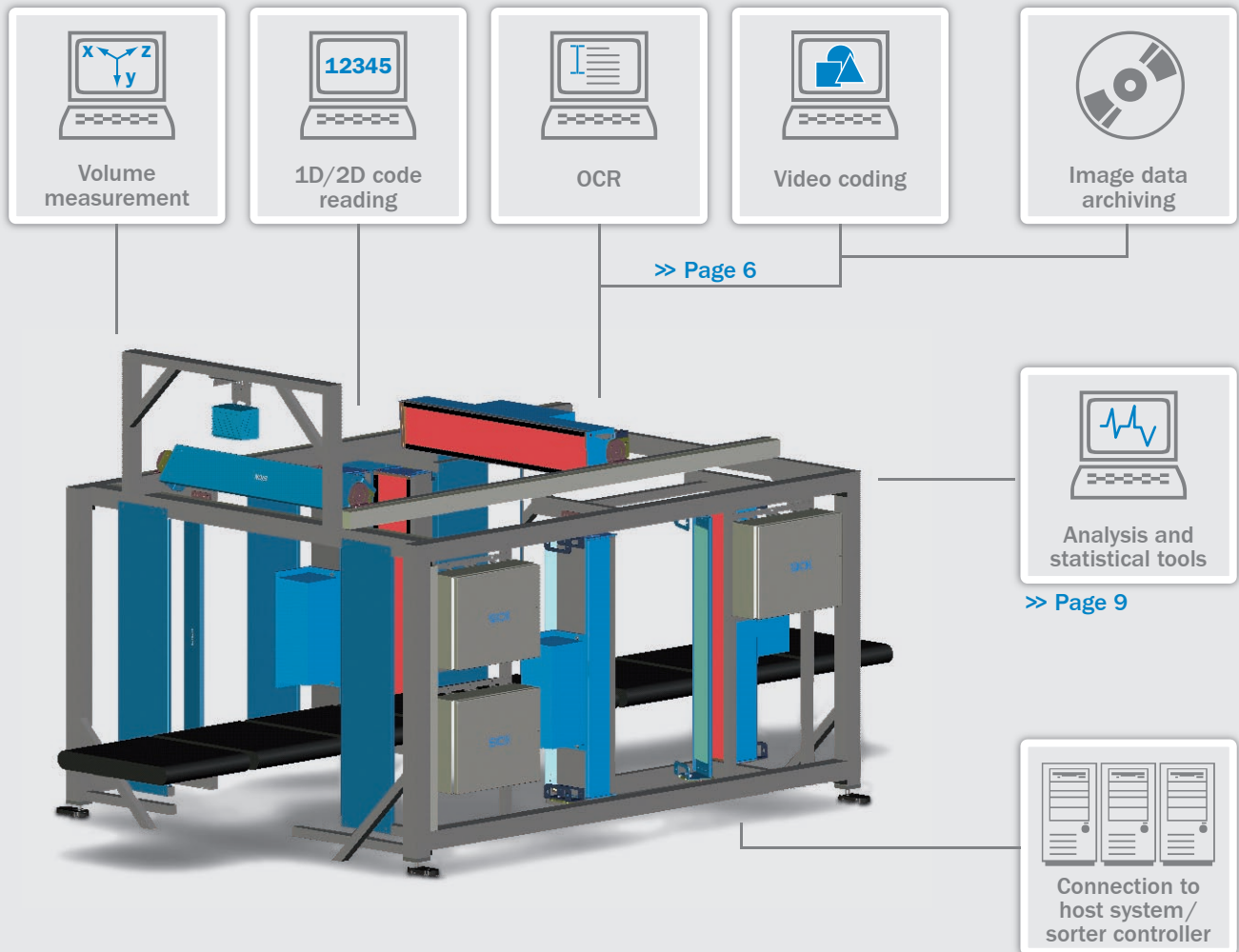
ICR890 High-end Camera System

Line-Scan Camera System for Reading 1D and 2D Codes and
Capturing Images for OCR and Video Coding Applications

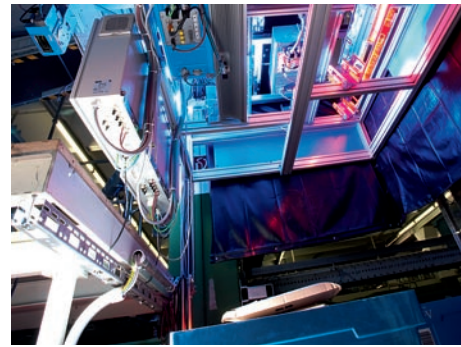
Customer-specific solutions from a single source feature ...

From simple bar code reading to complex identification solutions with data archiving: SICK is your professional partner for automating logistics processes.

- Development and production of all sensors
- Ultra-high performance and reliability of products
- Unique system flexibility thanks to complete product portfolio
- End-to-end, professional project management
- Easy installation and fast-response service with global network of branch offices
- Everything from a single source – one contact for your entire identification solution



... components that are designed to work together.



Based on the MSC800 embedded controller, each component is networked for optimal and reliable communication to create a comprehensive identification solution.

- Connection of all external sensors (photoelectric switches, encoders, digital I/Os)
- From simple one-side reading to a complex six-side camera tunnel
- Additional volume measurement for cubical and non-cubical objects with calibration (optional)
- Integration of laser-based bar code scanners
- Integration of scale data to create a complete DWS system
- Connection to host systems via multiple interfaces
- Basic configurations for identification solutions
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Encoder



Photoelectric switch



VMS4xx/5xx volume measurement system



CLV490 laser scanner (1 ... n)



ICR890 camera system (1 ... n)
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Conveyor speed

Reading trigger

Volume measurement

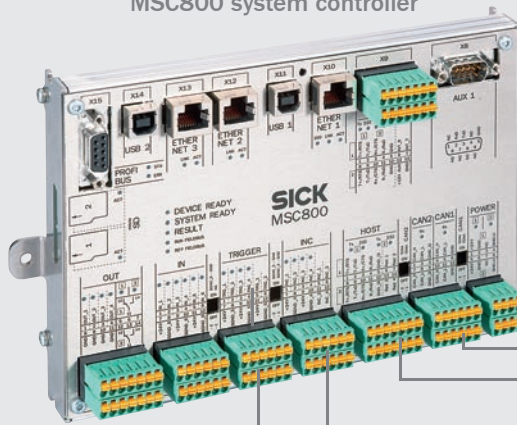
1D code reading

1D/2D code reading

Image output for OCR and video coding



MSC800 system controller



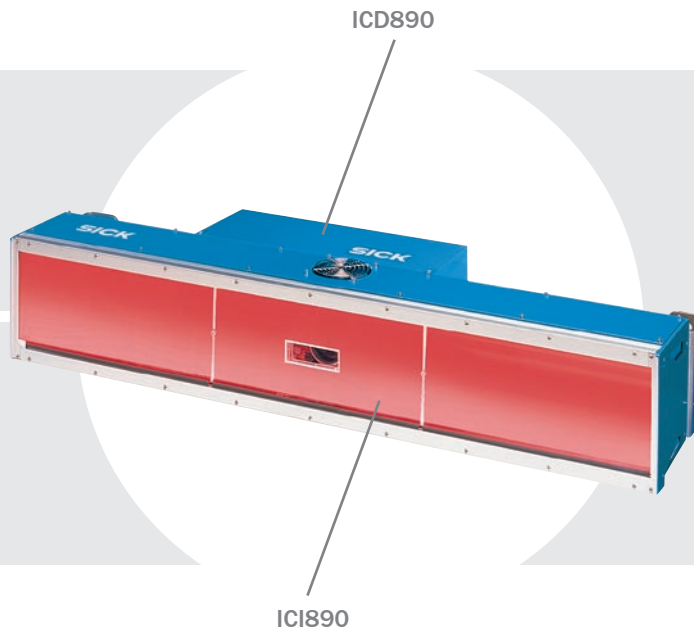
CAN



Connection to host system/
 sorter controller

The ICR890 camera system

The ICR890 camera system comprises two components, each of which can be exchanged independently of the other: the ICD890 high-end CCD camera with integrated high-performance decoder and the ICI890 LED light. This modular approach makes installation easy and thus minimises MTTR times.

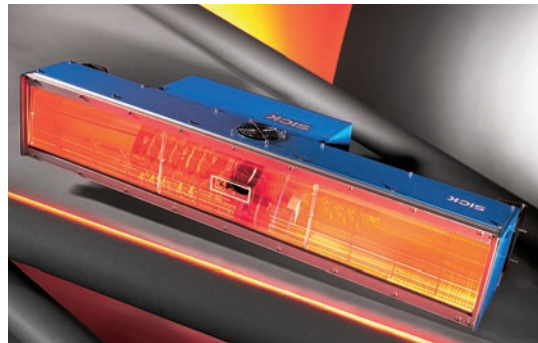


The ICD890 high-end CCD camera and ICI890 LED light

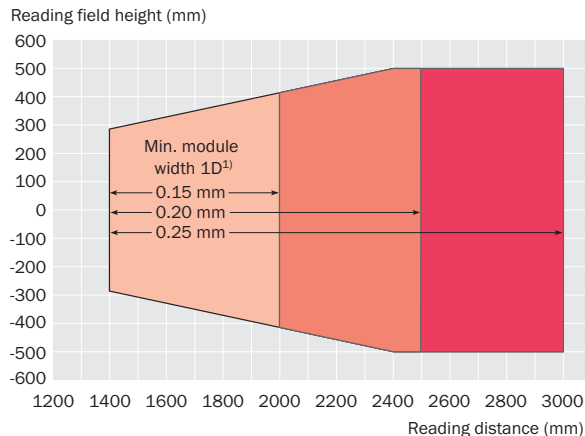
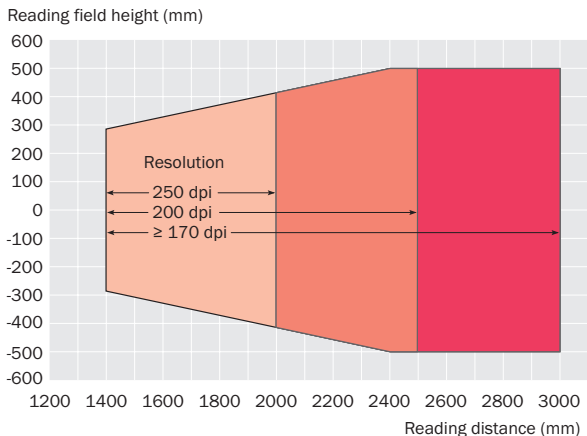
The ICD890 high-end CCD camera comes in a robust housing suitable for industrial environments and is easy to exchange due to quick-release fasteners. This camera is used for all scanning applications; components can therefore also be exchanged in the event of a failure. Likewise, each camera features an integrated parameter cloning module that stores all parameters

redundantly to avoid the need for reconfiguration. Images are transferred to the network via integrated Gbit/s interfaces.

The ICI890 light, which is fitted with 140 power LEDs, outputs powerful, homogenous light to illuminate the entire reading field.



Reading field diagrams



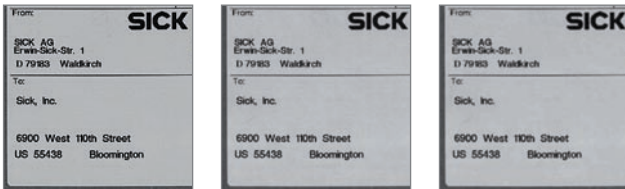
Technical data

Type	ICD890	ICI890
Function	Camera and decoding system	LED illumination
LED class	-	Class 1M (EN 60825-1)
Wavelength	-	Visible red light ($\lambda = 620 \text{ nm}$)
MTBF/MTTR ²⁾	> 80,000 h / < 10 min.	
CCD line sensor	8,192 pixels / max. 19.1 kHz line frequency	-
Image resolution / web width	See reading field diagrams	
Max. conveyor speed	2.4 m/s at 200 dpi resolution 4.8 m/s at 100 dpi resolution	
Supported lenses	135 mm focal length (standard)	-
Image data output	Gbit/s FTP	-
Immunity to ambient light	Max. 2,000 lx (on 1D / 2D bar codes)	
Code types	2/5 Interleaved, code 39, code 128, EAN / UPC with add-on, Codabar, EAN128, DataMatrix ECC200, PDF471 (others on request)	-
Number of codes per object	1D: max. 50; 2D: max. 10	-
Data interfaces	1 x 100 Mbit/s Ethernet; 2 x CAN bus 1 Mbit/s; 2 x 1 Gbit/s Ethernet image output	-
Power consumption	24 V DC \pm 15%; 400 W (typical)	
Housing	Aluminium die-cast	Aluminium extrusion
Dimensions	450 mm x 180 mm x 200 mm ³⁾	1,115 mm x 210 mm x 170 mm
Weight	13.5 kg	23.5 kg
Enclosure rating / protection class	IP 64 (to DIN 40050) / class 3 (to IEC 1010-1)	
Operating temperature	0 °C to +40 °C	
Max. relative humidity	95 %, non-condensing	
EMC / vibration / shock testing	To EN 61000-6-2, EN 61000-6-4 / IEC 68-2-6 / IEC 68-2-27, IEC 68-2-29	
Colour	Blue (RAL 5012)	

¹⁾ Code quality: ANSI A or B; tilt: 360°; skew/pitch: -15° to +15°; ²⁾ ICD890 and ICI890 are independently exchangeable; ³⁾ Including decoder

Capturing images with real-time processing for OCR, video coding, and archiving

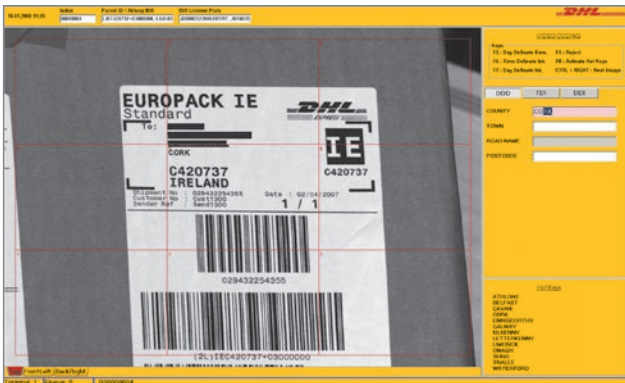
The ICR890 camera system can capture and decode up to 160 MB of image data per second. To transfer this data across a network to a server room, SICK developed a patented hardware-based JPEG compressor that compresses the image data to a fraction of its original size. This makes it possible to further process the images centrally for OCR and video coding or archive them on a server using a standard Gbit/s network.



Comparison of image quality with different settings (from left to right): original bitmap image, JPEG at 50 % quality, JPEG at 25 % quality

JPEG compressor

The JPEG compressor can change the quality of the image to suit the application. Settings range from very high quality for OCR scanning to very high compression for image archiving. This resource-intensive processing of raw data takes place directly on the integrated hardware of the ICR890 camera system so that decoding performance is not compromised. The JPEG algorithm has been optimised for viewing purposes such that even highly compressed images are still optimal for video coding or analysis.

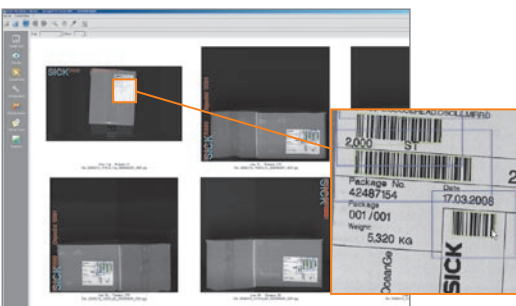


Customer-specific video coding solutions for address data entry

OCR and video coding



If a code is not to be scanned or no routing information for an identification code exists in the database, the address information in the image captured by the ICR890 camera system can be read out via OCR (Optical Character Recognition) or video coding. Images can be processed in minimal time, thanks to the ROI (Region of Interest) data generated by the ICR890. The package can remain on the sorter during this time. This greatly reduces the number of packages whose information must be processed subsequently by hand.



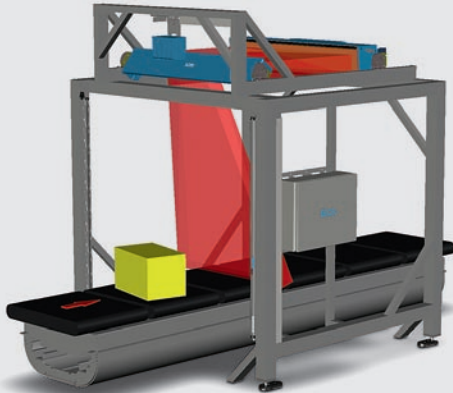
Detailed analysis of individual images using XML overlay information:
Blue boxes = regions of interest
Green boxes = decoding successful ("good read")

Archiving image data



Archived image data allows all shipments captured by camera to be tracked in full. All images and additional package data, such as volume and bar codes, are displayed on a customised interface. "No reads" can also be analysed offline. This makes the system highly transparent, since systematic errors (defective printers, etc.) can be identified and corrected based on the images.

Basic configurations and sample applications

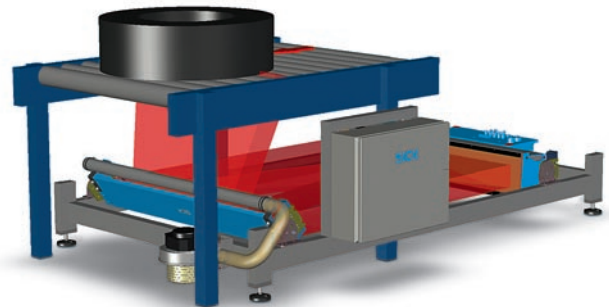


Top reading

- Single-side reading on all common conveyor systems (belt sorters, cross-belt conveyors, tray sorters, roller conveyors)
- Camera system focuses in conjunction with the VMS4xx/5xx volume measurement system or MLG light grid
- Maximum read rate (even for small codes and at high conveying speeds)
- CEP (courier, express, and parcel services)
- Retail/mail order
- Automotive industry (tyre reading)

Bottom reading

- Omnidirectional code reading on belt sorters and roller conveyors
- Maximum read rate (even for small and partially destroyed codes)
- Automotive industry (tyre reading)

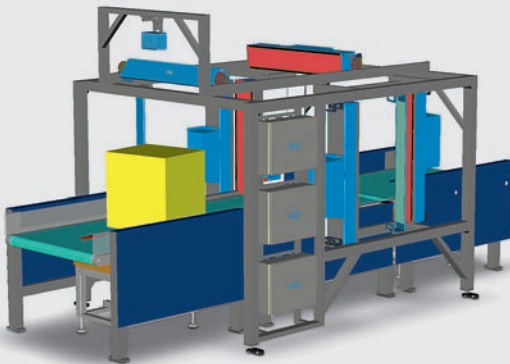
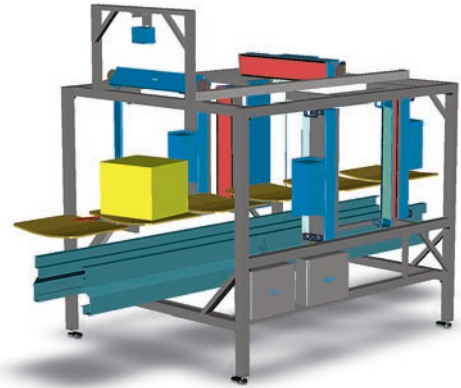


5-side reading with 3 ICR890 cameras

- Omnidirectional code reading on all conventional conveyor systems
- Five-side coverage with three cameras thanks to 45° angle side reading
- Objects must be aligned $\pm 15^\circ$ on conveyor
- Camera system focuses in conjunction with the VMS4xx/5xx volume measurement system
- CEP (courier, express, and parcel services)
- Retail

5-side reading with 5 ICR890 cameras

- Omnidirectional code reading independent of object position
- Maximum read rate (even when space between objects is minimal) through redundant coverage of package sides
- Camera system focuses in conjunction with the VMS4xx/5xx volume measurement system
- CEP (courier, express, and parcel services)
- Retail

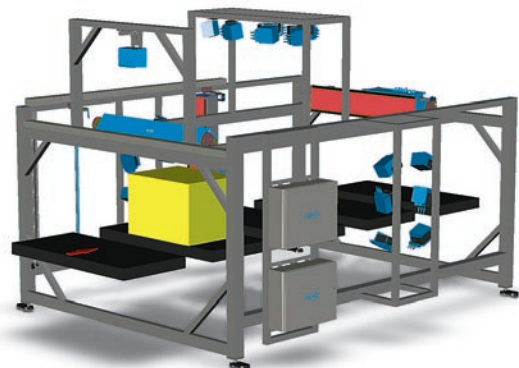


DWS system

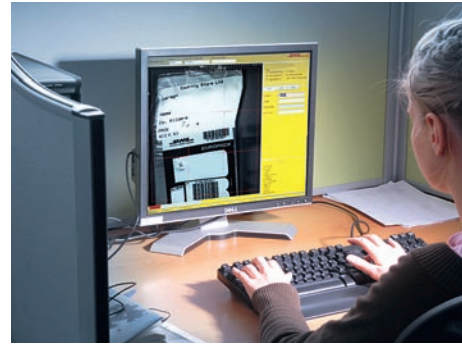
- Combined identification system for bar code reading, image capturing, volume and weight measurement
- All data is captured centrally
- Certified systems including alibi memory and MID display
- CEP (courier, express, and parcel services)
- Retail

Laser/camera hybrid system

- Omnidirectional code reading of up to six sides
- Redundant coverage of different sides for improved read rate of subsurface codes (→ counter skew)
- Top camera system can be expanded inexpensively for multi-side reading
- Package imaging for tracking purposes, etc. (optional)
- CEP (courier, express, and parcel services)
- Retail
- Automotive (tyre reading)



Software solutions from SICK: SOPAS-ET and RDT400



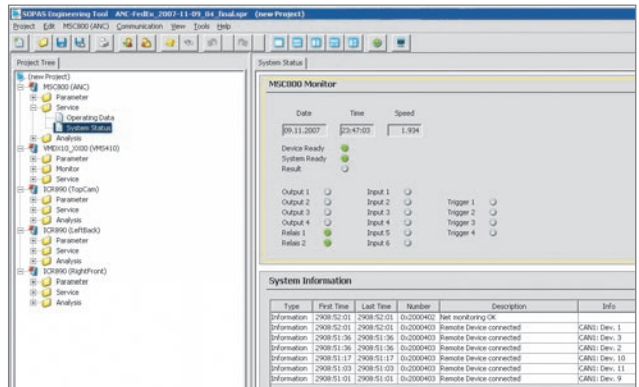
Configure your SICK components using the core SOPAS-ET engineering tool to diagnose an error quickly and easily, access online help, and perform preventive diagnosis for maintenance purposes.

No matter where you are, the RDT400 remote diagnosis tool lets you analyse your scanning statistics. From anywhere in the world.

SOPAS-ET



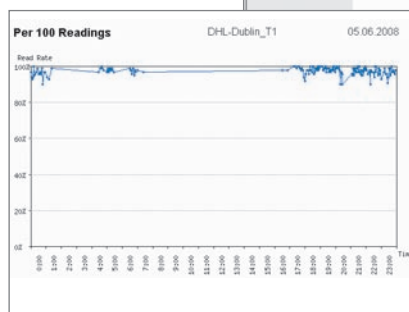
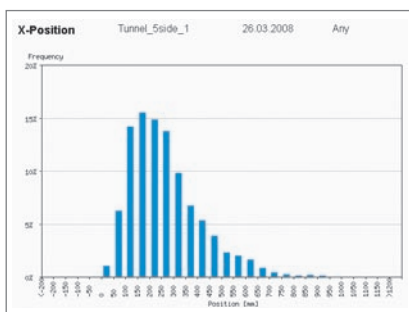
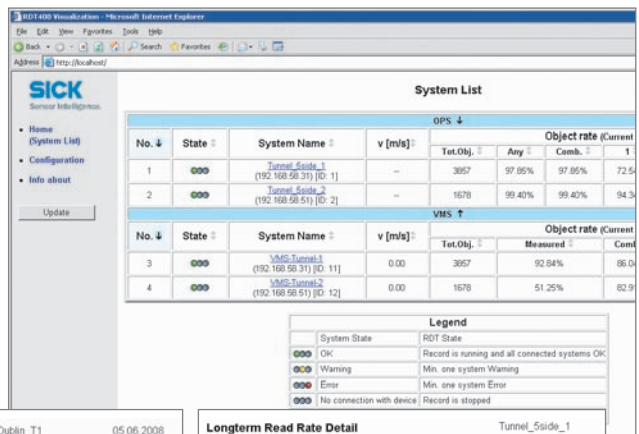
This configuration software was developed as an engineering tool with all SICK devices in mind. SOPAS-ET allows you to group all of your ideally configured components and manage them as a project. Thanks to real-time control, you are always aware of the status of all functions and are notified of changes immediately. This homogeneous environment results in optimum system efficiency: Any situation can be responded to without delay by means of a quick and easy diagnosis. Comprehensive online help provides assistance if needed.



RDT400



The RDT400 graphical visualisation tool can monitor your identification system from any location in the world. To this end, the tool connects to existing network infrastructures such as Ethernet and utilizes standardised technologies, including web browsers and TCP/IP transmission. Permanent monitoring of system performance translates into maximum transparency of system processes at all times.



FACTORY AUTOMATION

With its intelligent sensors, safety systems, and auto idet applications, SICK realises comprehensive solutions for factory automation.

- Non-contact detecting, counting, classifying, and positioning of any types of object
- Accident protection and personal safety using sensors, as well as safety software and services



LOGISTICS AUTOMATION

Sensors made by SICK form the basis for automating material flows and the optimisation of sorting and warehousing processes.

- Automated identification with bar code and RFID reading devices for the purpose of sorting and target control in industrial material flow
- Detecting volume, position, and contours of objects and surroundings with laser measurement systems



PROCESS AUTOMATION

Analyzers and Process Instrumentation by SICK MAIHAK provides for the best possible acquisition of environmental and process data.

- Complete systems solutions for gas analysis, dust measurement, flow rate measurement, water analysis or, respectively, liquid analysis, and level measurement as well as other tasks



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