



TIC102, TIC501, TIC502

RELIABLE VEHICLE CLASSIFICATION OVER
MULTIPLE LANES

Profiling systems

SICK
Sensor Intelligence.

SAFE AND EFFICIENT SYSTEMS FOR PERFECT TOLL COLLECTION AND TRAFFIC MANAGEMENT

Every road user wants to see a smooth flow of traffic without any hold-ups, accidents, long queues or searching for that one elusive parking space. Toll and traffic management systems ensure safety and efficiency on the road.

The prerequisite for this is a system which combines data collection, transmission and processing. Rugged sensor solutions constitute the foundations of a reliable system for monitoring and controlling traffic. The recorded data can be used for effective traffic management: It enables traffic analyses and traffic jam detection in real time.

With the TIC series, SICK is falling back on its decades of experience in laser technology. The traffic information collector systems are based on 2D LiDAR sensors which deliver reliable

measurement data with extremely fast multi-echo technology, regardless of the weather conditions. The Traffic Controller TIC evaluation unit immediately provides the recorded data as a 3D point cloud. The 2D LiDAR sensors scan passing vehicles up to 100 times a second. Does this seem like too much? Not for SICK sensors! Depending on the requirement, TIC systems from SICK have all lanes in view at once.



TRAFFIC DATA - PERFECTLY RECORDED

Exact measured values are the basis for any traffic management system. TIC delivers comprehensive data collection and evaluation of a large range of factors:

- Exact vehicle classification
- Confidence level for every measured value
- Temporal distance between vehicles
- Positive vehicle identification with a time stamp for optionally installed third-party systems, such as cameras for license plate recognition

The system impresses with its sensing range, accuracy and ruggedness. With its 2D LiDAR sensors, the TIC detects the entire width of the road across multiple lanes. The system distinguishes every single vehicle, even in stop-and-go traffic, detects vehicles changing lanes and can be easily adjusted to temporal lane shifts with the configuration wizard.



THREE SYSTEMS FOR RELIABLE TRAFFIC MANAGEMENT

The profiling systems of the TIC series are designed for use in free-flowing traffic, toll collection as well as traffic management and traffic statistic applications. The mounting position, number and composition of the system components can be adapted easily to the local conditions. No fixtures in the road surface are necessary for any of the variants, which considerably reduces the time and effort needed for mounting. The system components are resistant to weather conditions and temperature fluctuations and are therefore very maintenance-friendly. The TIC series consists of three system variants:

TIC102

The TIC102 is delivered as a system in a housing, including 2D LiDAR sensors, Traffic Controller TIC and internal wiring. The TIC102 is mounted above the road. One lane is detected per system.



TIC502

The TIC502 is delivered on a mounting panel with pre-mounted and pre-configured 2D LiDAR sensors. The system software is installed on the separate Traffic Controller TIC. The TIC502 is mounted above the road. One lane is detected per system.



TIC501

The TIC501 is composed of a 2D LiDAR sensor as well as the Traffic Controller TIC including pre-installed software. The TIC501 is mounted above the road or at the roadside. The TIC501 detects several lanes per system used.



TIC102 AND TIC502 LOOK FROM THE TOP

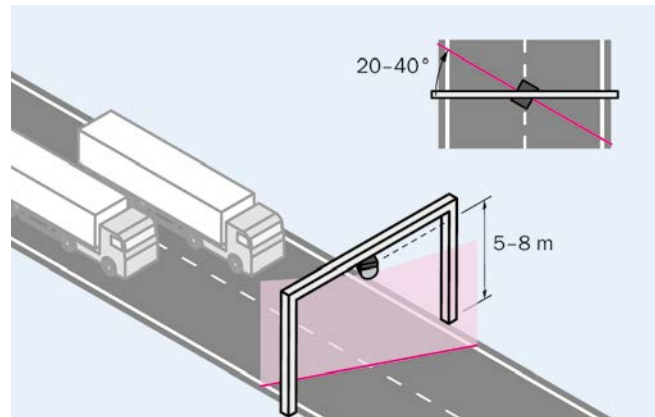
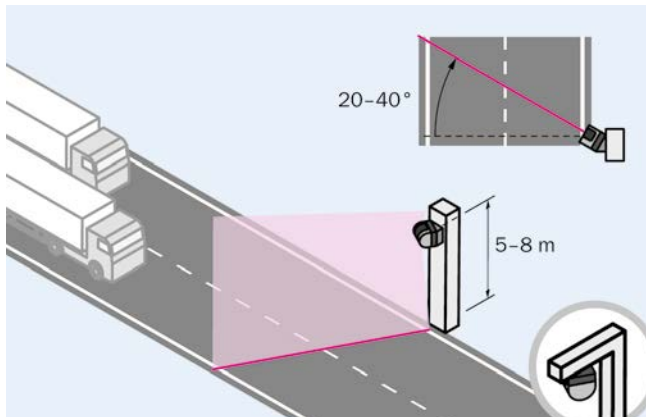
For the TIC102 and TIC502 system variants, the 2D LiDAR sensors are installed above the road. One system with two 2D LiDAR Sensors each detects one lane. The systems can be extended to include a roadside 2D LiDAR sensor for axle counting. The combination of the data from the 2D LiDAR sensors mounted on the roadside and above the road surface ensures reliable vehicle classification and axle counting, including the confidence level.



TIC501 LOOKS FROM THE SIDE

The TIC501 system variant is installed at the roadside. With this type of installation, there are no costs for constructing bridging portals or installing road blocks.

When mounting five to eight meters above the lane, the TIC501 ensures outstanding measurement precision and protection against tampering. A single system can detect several lanes and can be extended to include up to four 2D LiDAR sensors.

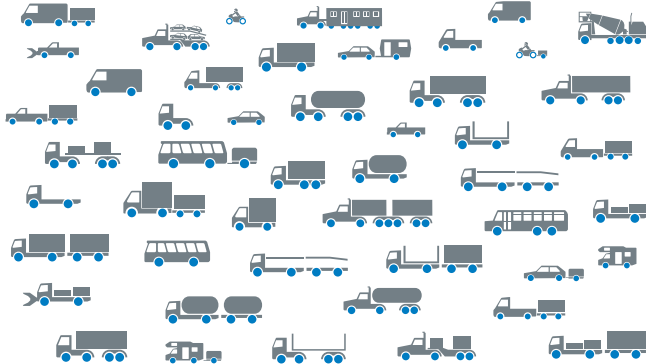


TIC IN ACTION

Depending on the task and configuration, TIC systems can fulfill a wide range of functions. Their main application is vehicle classification for electronic toll collection on multi-lane roads as well as in fast lanes at toll stations.

Axle counting

Using an additional 2D LiDAR sensor mounted on the roadside, the TIC102 and TIC502 systems also count the axles of passing vehicles. This is an important detail which is used for toll calculation, for example. The data of the additional 2D LiDAR sensor is transmitted in the same protocol as the classification. This makes further processing of data more user-friendly.



Vehicle classification

In free-flowing traffic, TIC systems scan passing vehicles, identify them by their shape and sort them into up to 30 defined vehicle classes. Depending on the region of application, the classification categories are adapted to local vehicle features.



Axle counting with a 2D LiDAR sensor mounted at the roadside



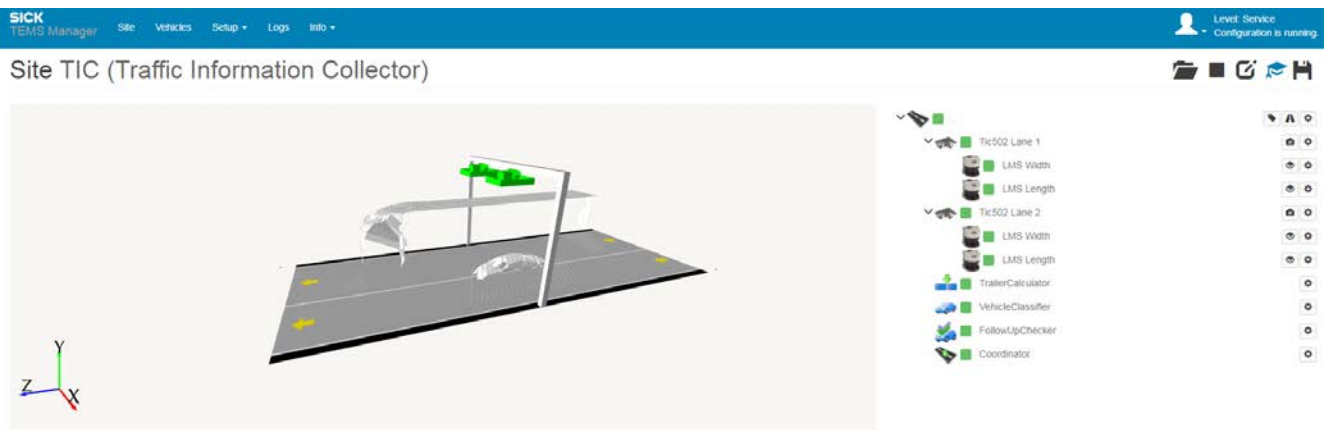
The TIC502 in use on the highway near Stans, Switzerland

CUSTOMIZED DATA EVALUATION

Not only the easy mounting of the TIC guarantees uncomplicated traffic data evaluation. The user interface is also particularly user-friendly and enables the query of individually requested data from the Traffic Controller TIC. The system immediately visualizes the vehicles as 3D point clouds, therefore enabling reliable identification. The web server automatically saves the data of the last 50 vehicles.

The user interface is web-based and system-independent. It is therefore not necessary to install additional software to operate the TIC. A configuration wizard helps set up the system quickly and easily and adapts it individually to the local conditions.

For larger projects, SICK also offers the option of embedding the software of the profiling system into the company network. In this case, SICK delivers the 2D LiDAR sensors and an image of the software which the customer can install and operate on its own server.



User interface of the Traffic Information Collector

PRODUCT FAMILY OVERVIEW



TIC102

Reliable vehicle classification and axle counting

Field of application	Traffic management Toll collection
System components	LMS111 (2 x)
Scanner design	2-scanner solution
Installation position	Overhead
Integrated application	Vehicle classification Vehicle counting Axle counting
Axle counting option	Yes, by means of additional LMS511 SE
Number of covered lanes	1
System extension	Up to 4 lanes
Trigger lines	Up to max. 15 m (recommended max. 10 m)
Counting accuracy	> 99.8 %
Classification accuracy	Typ. 98 % (For TLS8+1 classes)
Weight	16.1 kg / 15 kg
Ambient temperature operation	-20 °C ... +50 °C

At a glance

- Highly precise vehicle classification and axle counting in all traffic conditions
- Reliable in free-flowing traffic and stop-and-go traffic
- Detection of lane changers
- Detection of up to 30 different vehicle classes
- Time synchronization with external systems
- Easy to install and commission

Detailed information

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TIC501

Reliable counting and classification with one sensor over several lanes



TIC502

The benchmark in non-contact vehicle classification

Traffic management	Traffic management Toll collection
LMS511 SE	LMS511 SE (2 x)
1-scanner solution	2-scanner solution
Overhead or laterally	Overhead
Vehicle classification	Vehicle classification
Vehicle counting	Vehicle counting
	Speed monitoring
	Axle counting
No	Yes, by means of additional LMS511 SE
Up to 4 lanes	1
Up to 16 lanes	Up to 4 lanes
Max. 15 m (Calculated)	Max. 20 m
> 99.8 % (overhead detection of 2 lanes with one LMS511 SE)	> 99.85 %
Typ. 96 % (For TLS8+1 classes, overhead detection of 2 lanes)	Typ. 98 % (For TLS8+1 classes)
4.4 kg	12.8 kg / 12 kg
-40 °C ... +60 °C	-40 °C ... +60 °C

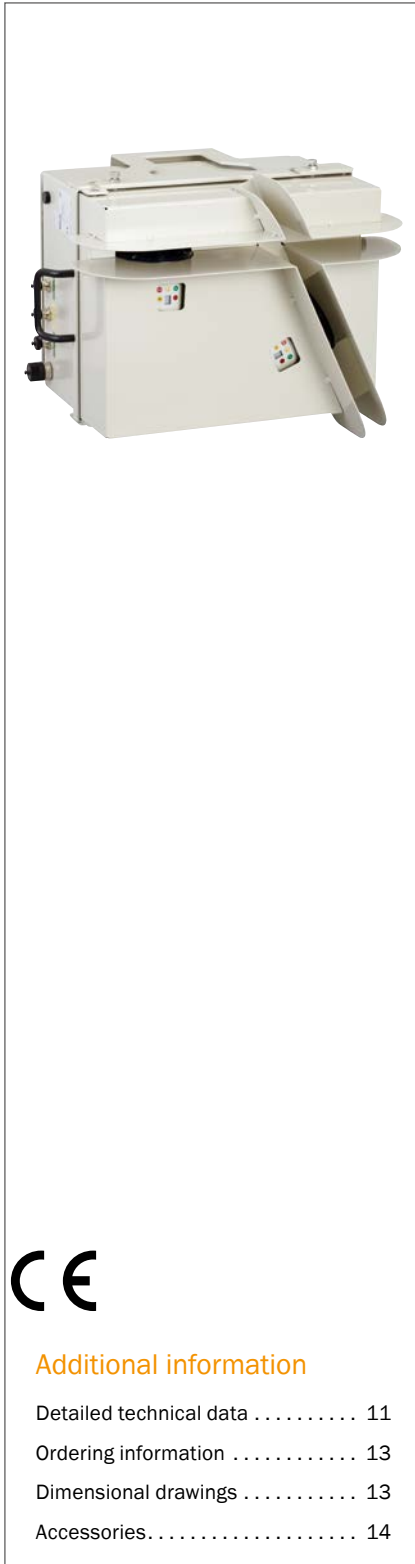
- Precise vehicle counting and classification in free-flowing traffic
- Maximum mounting flexibility: mounting above and at the side of the road possible
- Detects multiple lanes at the same time
- Highly precise counting, even for vehicles changing the lanes
- Classification of up to 30 different vehicle categories
- Easy to install and commission

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- Highly precise classification in up to 30 different vehicle classes
- Reliable in free-flowing and stop-and-go traffic
- Web-based user interface
- Works in all climate zones (-40 °C ... +60 °C) thanks to expanded temperature range
- Data history of the last 50 vehicles detected
- Can be extended to include the axle counting function

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RELIABLE VEHICLE CLASSIFICATION AND AXLE COUNTING



Product description

The TIC102 (Traffic Information Collector) profiling system is based on SICK's proven laser measurement technology. It is designed for use in multi-lane, free-flowing traffic and stop-and-go traffic for toll systems and for performing traffic management. A highly innovative configuration tool, including a live 3D view, allows commissioning in just a few minutes. The system is automatically calibrated during flowing traffic and provides an integrated remote maintenance

function. Configurable software triggers significantly improve the detection and read rates of license plate cameras and DSRC antennas. The TIC102 profiling system has been enhanced with a road-side 2D LiDAR sensor for axle counting. The combination of the data from the 2D LiDAR sensors mounted on the side and above the road surface ensures reliable axle counting, including the confidence level.

At a glance

- Highly precise vehicle classification and axle counting in all traffic conditions
- Reliable in free-flowing and stop-and-go traffic
- Detection of lane changers
- Detection of up to 30 different vehicle classes
- Time synchronization with external systems
- Easy to install and commission

Your benefits

- Automatic calibration allows commissioning in just a few minutes
- Intuitive graphical user interface allows quick and easy operation
- Full detection of vehicles and axles increases classification accuracy
- Simple and economical installation above the roadway. No work is required on the road surface.
- The software trigger improves the detection and reading rate of license plate detection cameras or the DSRC antenna system
- Long maintenance intervals and fast installation reduce operating costs to a minimum
- Reliable operation even at night and in inclement weather



Additional information

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→ www.sick.com/TIC102

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Detailed technical data

The exact device specifications and performance data of the product may deviate from the information provided here, and depend on the application in which the product is being used and the relevant customer specifications.

TIC102

Features

	TIC102-20000	TIC102-02000
Field of application	Traffic management Toll collection	
System part	TIC102 Master (integrated control unit)	TIC102 Slave (without control unit; must be connected to a TIC102 Master)
System components	LMS111 (2 x)	
Number of covered lanes	1	
System extension	Up to 4 lanes	
Integrated application	Vehicle classification, vehicle counting, Axle counting	
Axle counting option	Yes, by means of additional LMS511 SE	
Scanner design	2-scanner solution	
Vehicle data	Vehicle class (selectable category systems with up to 30 classes) Driving direction Lane assignment Confidence level for all vehicle datas Point cloud	
Recommended distance between max. vehicle height and sensor	Typ. 1.5 m,	
Calibration	Automatic	
Laser class	1, eye-safe (IEC 60825-1:2014)	
Heating	✓	
Internal computer	Traffic Controller TIC	–
Trigger lines	Up to max. 15 m (recommended max. 10 m)	

Performance

Counting accuracy	> 99.8 %
Classification accuracy	Typ. 98 % (For TLS8+1 classes)

Interfaces

	TIC102-20000	TIC102-02000
Optical indicators	LED, status and function display	
NTP synchronization	✓	–
Ethernet	✓ (3)	✓ (2)
Function	Operator interface, sensor interface	Sensor interface
Data transmission rate	1 Gbit/s, for each interface	
Protocol	TEMS Info Interface (TCP/IP Interface) TEMS Manager (HTTP configuration software)	–
Electrical connection	1 x connector ETH_Host (M12) for operator interface, 2 x connector ETH_Internal (M12) for sensor interface	2 x connector ETH_Internal (M12) for sensor interface

Mechanics/electronics

	TIC102-20000	TIC102-02000
Supply voltage	24 V DC (22.8 V DC ... 25.2 V DC)	

	TIC102-20000	TIC102-02000
Power consumption	130 W, With heating 51 W, without heating	120 W, With heating 41 W, without heating
Housing dimensions (W x D x H)	355 mm x 482 mm x 373 mm	
Weight	16.1 kg	15 kg
Installation position	Overhead	
Installation height	6 m, 5 m ... 8 m	
Enclosure rating	IP66 (EN 60529)	

Ambient data

Ambient temperature operation	-20 °C ... +50 °C ¹⁾
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LMS511 SE

General notes

Description	Configured 2D LiDAR sensor for profiling systems used for traffic applications. Complete specifications can be found under the standard resolution LMS511-10100 PRO (1046135).
Note on use	The sensor does not constitute a safety component as defined by relevant legislation on machine safety.

Features

Field of application	Outdoor
Version	Mid Range
Resolution power	Standard Resolution
Light source	Infrared (905 nm)
Laser class	1, eye-safe (IEC 60825-1:2014)
Aperture angle	190°
Heating	Yes
Amount of evaluated echoes	5
Fog correction	Yes

Interfaces

Ethernet	✓
Function	Host
Data transmission rate	10/100 MBit/s
Protocol	TCP/IP, OPC
Optical indicators	5 LEDs (Additional 7-segment display)

Mechanics/electronics

Electrical connection	4 x M12 round connector
Supply voltage	24 V DC (19.2 V DC ... 28.8 V DC)
Power consumption	22 W, + 55 W heating (typical)
Housing color	Gray (RAL 7032)
Enclosure rating	IP67 (EN 60529, Section 14.2.7)
Protection class	III (EN 60529, Section 14.2.7)
Weight	3.7 kg
Dimensions (L x W x H)	160 mm x 155 mm x 185 mm

Ambient data

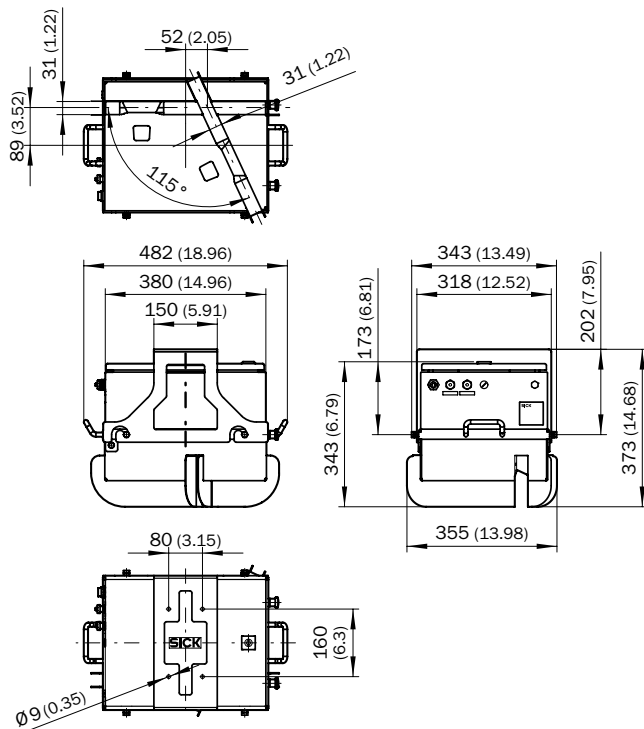
Object remission	2 % ... > 1,000 % (reflectors)
Electromagnetic compatibility (EMC)	EN 61000-6-2:2005, EN 61000-6-3 (2007-03)
Vibration resistance	EN 60068-2-6 (1995-04)
Shock resistance	EN 60068-2-27 (1993-03), EN 60068-2-29 (1993-04)
Ambient operating temperature	-40 °C ... +60 °C
Storage temperature	-40 °C ... +70 °C
Ambient light immunity	70,000 lx

Ordering information

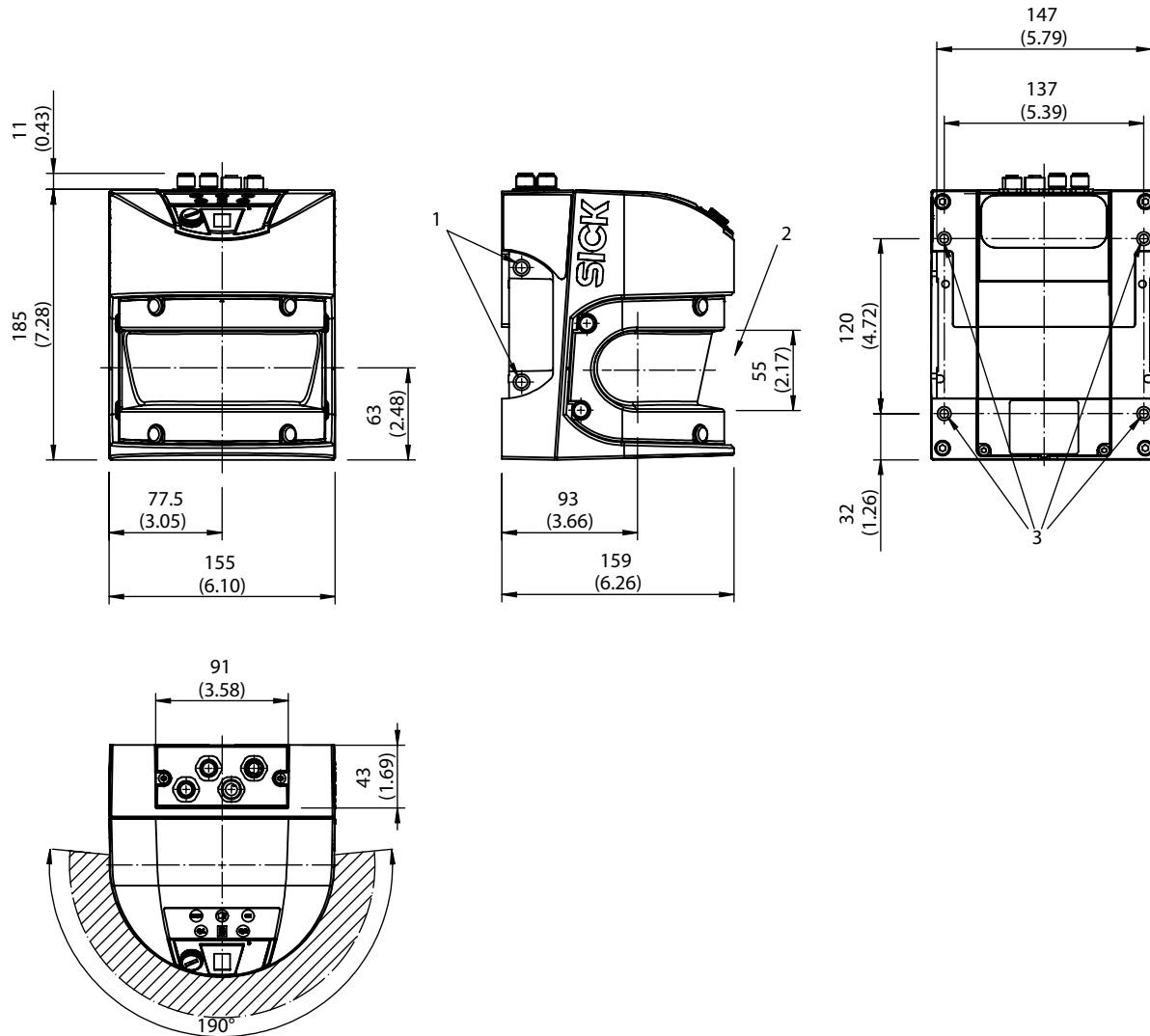
System part	Internal computer	Type	Part no.
TIC102 Master	Traffic Controller TIC	TIC102-20000	1055102
TIC102 Slave	—	TIC102-02000	1055104

Dimensional drawings (Dimensions in mm (inch))

TIC102



LMS511 SE






- ① 4 screw holes M8 x 9
- ② Do not block front screen
- ③ 4 screw holes M6 x 8







Accessories

Mounting systems

Device protection (mechanical)






	Brief description	Type	Part no.	TIC102-20000	TIC102-02000	LMS511 SE
	Protection hood	Protection cover	2056850	-	-	●
	Weather hood for TIC102	Weather hood	4068062	●	●	-
	Weather hood (180°), vertical mounting	Weather hood	2063050	-	-	●

Mounting brackets and plates

	Brief description	Type	Part no.	TIC102-20000	TIC102-02000	LMS511 SE
	Mounting bracket	Mounting bracket	4068061	●	●	-
	Mounting bracket for LMS5xx (for retrofitting, if 2018303 is already in use)	Mounting bracket	2059271	-	-	●
	Mounting kit for wall-mounting (adjustment bracket), steel, zinc coated	Mounting kit	2018303	-	-	●
	Mounting bracket for direct mounting, from the rear, on wall or machine, not adjustable	Mounting kit 1	2015623	-	-	●
	Mounting bracket for rear mounting on wall or machine, adjustable longitudinal and lateral axes, only in conjunction with mounting kit 1 (2015623) and 2 (2015624)	Mounting kit 2	2015624	-	-	●
	Mounting bracket for rear mounting on wall, floor, or machine, adjustable longitudinal and lateral axes, only in conjunction with mounting kit 1 (2015623) and 2 (2015624)	Mounting kit 3	2015625	-	-	●



Connection systems

Plug connectors and cables

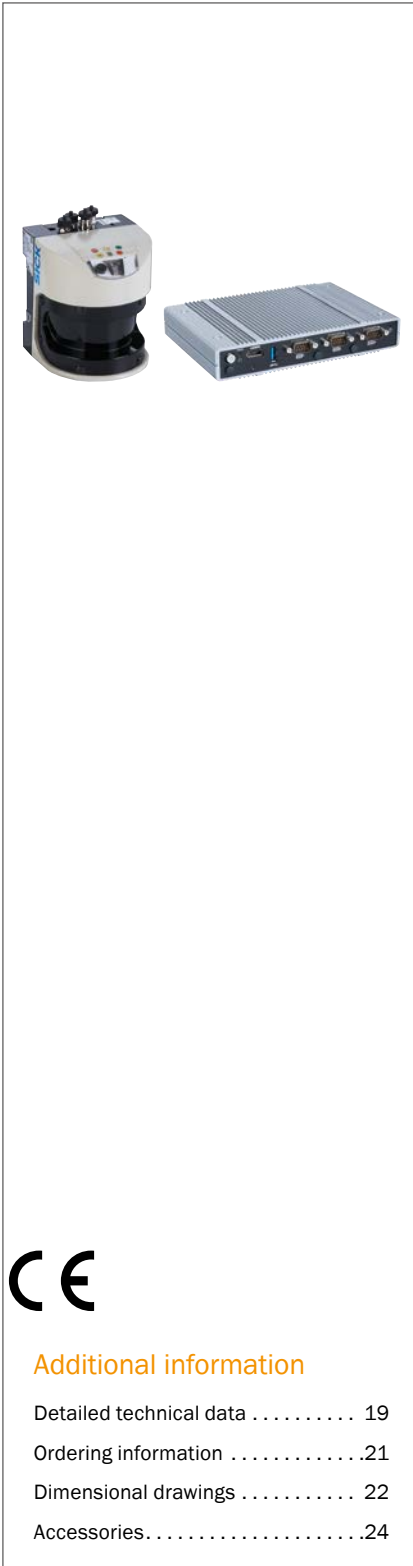
	Brief description	Type	Part no.	TIC102-20000	TIC102-02000	LMS511 SE
	5-wire, 30 m	Connecting cable (female connector - open)	6045327	●	●	-
	15 m	Connection cable (male connector-male connector)	6045328	●	●	-
	4-wire, 30 m	Connection cable (male connector-male connector)	6045311	●	●	-
	4-wire, 5 m	DOL-1204-G05MACO	6054495	-	-	●
	4-wire, 10 m	DOL-1204-G10MACO	6054494	-	-	●
	4-wire, 20 m	DOL-1204-G20MACO	6050687	-	-	●
	4-wire, 5 m	SSL-2J04-G05MACO	6054493	-	-	●
	4-wire, 10 m	SSL-2J04-G10MACO	6054492	-	-	●
	4-wire, 20 m	SSL-2J04-G20MACO	6050685	-	-	●

Further accessories

Test and monitoring tools

	Brief description	Type	Part no.	TIC102-20000	TIC102-02000	LMS511 SE
	Scan finder, receiver to localize infrared scans	Scan-Finder LS-80L	6020756	-	-	●
	Type		Part no.	TIC102-20000	TIC102-02000	LMS511 SE
	LMS511 SE		1091458	●	●	-

RELIABLE COUNTING AND CLASSIFICATION WITH ONE SENSOR OVER SEVERAL LANES



Additional information

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Product description

The TIC501 (Traffic Information Collector) profiling system is designed for traffic management and statistical applications in multi-lane, free-flowing traffic. The mounting position of the system components can be adapted easily to the local conditions, which allows the TIC501 to be installed above the lane, between two lanes or next to

the road on street lamps and poles. One TIC501 can detect several lanes at the same time, reducing the installation and commissioning costs. The intuitive user interface guides the operator through the commissioning process in just a few steps. The measurement results are then displayed directly as a 3D point cloud, including the classification result.

At a glance

- Precise vehicle counting and classification in free-flowing traffic
- Maximum mounting flexibility: mounting above and at the side of the road possible
- Detects multiple lanes at the same time
- Highly precise counting, even for vehicles changing the lanes
- Classification of up to 30 different vehicle categories
- Easy to install and commission

Your benefits

- Installation next to the road removes costs associated with gantries and lane closures
- One TIC501 can monitor several lanes at once, reducing overall costs
- Quick, easy and cost-effective mounting since no work is required on the road surface
- Temporary lane changes, for example in construction areas, do not require the TIC501 to be repositioned, allowing continuous operation
- Long maintenance intervals and short installation times reduce operating costs
- Intuitive graphical user interface allows quick and easy operation
- Fast implementation thanks to TCP/IP interface

→ www.sick.com/TIC501

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Detailed technical data

The exact device specifications and performance data of the product may deviate from the information provided here, and depend on the application in which the product is being used and the relevant customer specifications.

TIC501

General notes

Items supplied	2D LiDAR sensor LMS511 SE Traffic Controller TIC with TIC software including USB Stick with TEMS info sample client, source code for TEMS info sample client, TEMS analyzer and operating instructions
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Features

Field of application	Traffic management
System components	LMS511 SE
Number of covered lanes	Up to 4 lanes
System extension	Up to 16 lanes
Integrated application	Vehicle classification, vehicle counting
Axle counting option	No
Scanner design	1-scanner solution
Vehicle data	Vehicle class (selectable category systems with up to 30 classes) Lane assignment Confidence level for all vehicle datas Point cloud
Trigger lines	Max. 15 m (Calculated)

Performance

Counting accuracy	> 99.8 % (overhead detection of 2 lanes with one LMS511 SE)
Classification accuracy	Typ. 96 % (For TLS8+1 classes, overhead detection of 2 lanes)

Interfaces

Ethernet	Function	✓ Operator interface
	Protocol	TEMS Info Interface (TCP/IP Interface) TEMS Manager (HTTP configuration software)

Mechanics/electronics

Weight	4.4 kg
Installation position	Overhead or laterally

Ambient data

Ambient temperature operation	-40 °C ... +60 °C
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LMS511 SE

General notes

Description	Configured 2D LiDAR sensor for profiling systems used for traffic applications. Complete specifications can be found under the standard resolution LMS511-10100 PRO (1046135).
Note on use	The sensor does not constitute a safety component as defined by relevant legislation on machine safety.

Features

Field of application	Outdoor
Version	Mid Range
Resolution power	Standard Resolution
Light source	Infrared (905 nm)
Laser class	1, eye-safe (IEC 60825-1:2014)
Aperture angle	190°
Heating	Yes
Amount of evaluated echoes	5
Fog correction	Yes

Interfaces

Ethernet	Function	✓ Host
	Data transmission rate	10/100 MBit/s
	Protocol	TCP/IP, OPC
	Optical indicators	5 LEDs (Additional 7-segment display)

Mechanics/electronics

Electrical connection	4 x M12 round connector
Supply voltage	24 V DC (19.2 V DC ... 28.8 V DC)
Power consumption	22 W, + 55 W heating (typical)
Housing color	Gray (RAL 7032)
Enclosure rating	IP67 (EN 60529, Section 14.2.7)
Protection class	III (EN 60529, Section 14.2.7)
Weight	3.7 kg
Dimensions (L x W x H)	160 mm x 155 mm x 185 mm

Ambient data

Object remission	2 % ... > 1,000 % (reflectors)
Electromagnetic compatibility (EMC)	EN 61000-6-2:2005, EN 61000-6-3 (2007-03)
Vibration resistance	EN 60068-2-6 (1995-04)
Shock resistance	EN 60068-2-27 (1993-03), EN 60068-2-29 (1993-04)
Ambient operating temperature	-40 °C ... +60 °C
Storage temperature	-40 °C ... +70 °C
Ambient light immunity	70,000 lx

Traffic Controller TIC

General notes

Note on use	Receipt and filtering of sensor data Processing for TIC vehicle data Output of vehicle and diagnostic data via the user interface
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Features

Field of application	Indoor
Internal memory	32 GB

Interfaces

Optical indicators	LED status and function display
Ethernet	✓ (2)
Function	Operator interface, sensor interface
Data transmission rate	1 Gbit/s, for each interface
Protocol	TEMS Info Interface (TCP/IP Interface) TEMS Manager (HTTP configuration software)
Electrical connection	Connector LAN 1 (RJ45) for operator interface, connector LAN 2 (RJ45) for sensor interface
NTP synchronization	✓

Mechanics/electronics

Supply voltage	24 V DC (9 V DC ... 25 V DC)
Power consumption	10 W (typical)
Enclosure rating	IP20
Weight	0.8 kg
Housing dimensions (W x D x H)	180 mm x 121.2 mm x 33 mm
Fixing	Screwable

Ambient data

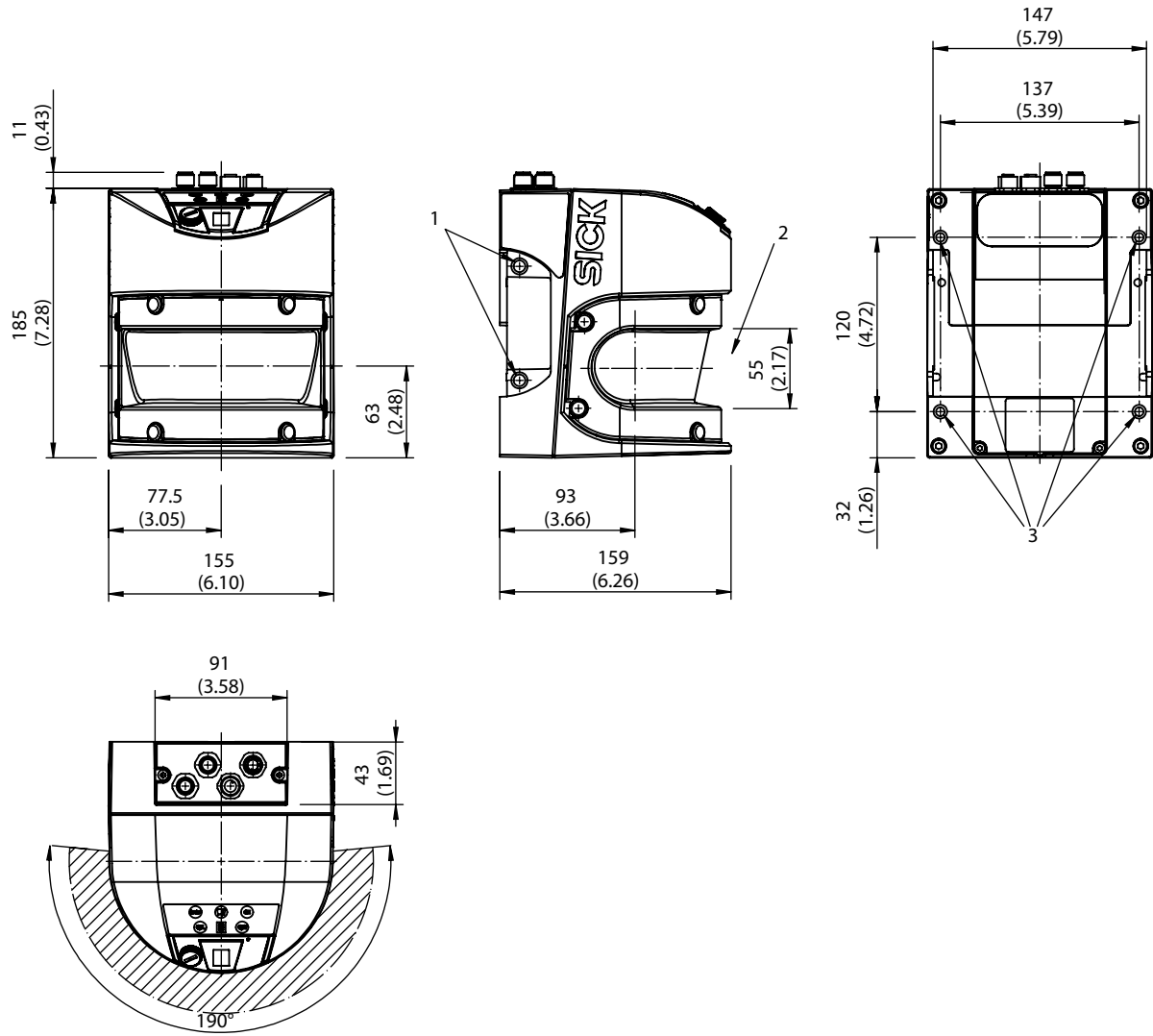
Electromagnetic compatibility (EMC)	EN 55024, EN 55022 Class A
Ambient temperature operation	-20 °C ... +60 °C
Ambient storage temperature	-20 °C ... +85 °C

Ordering information

Items supplied	Integrated application	Type	Part no.
2D LiDAR sensor LMS511 SE Traffic Controller TIC with TIC software including USB Stick with TEMS info sample client, source code for TEMS info sample client, TEMS analyzer and operating instructions	Vehicle classification, vehicle counting	TIC501	1069322

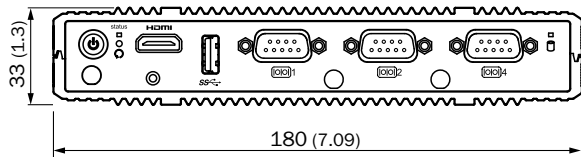
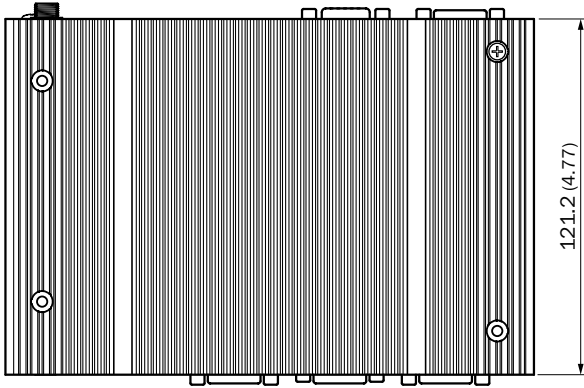
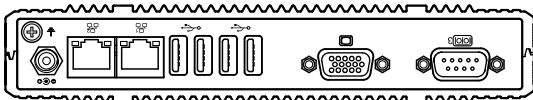
Dimensional drawings (Dimensions in mm (inch))

LMS511 SE



- ① 4 screw holes M8 x 9
- ② Do not block front screen
- ③ 4 screw holes M6 x 8

Traffic Controller TIC








Accessories

Mounting systems

Device protection (mechanical)

	Brief description	Type	Part no.
	Weather hood (180°), vertical mounting	Weather hood	2063050


Mounting brackets and plates

	Brief description	Type	Part no.
	Mounting bracket for LMS5xx (for retrofitting, if 2018303 is already in use)	Mounting bracket	2059271
	Mounting kit for wall-mounting (adjustment bracket), steel, zinc coated	Mounting kit	2018303
	Mounting bracket for direct mounting, from the rear, on wall or machine, not adjustable	Mounting kit 1	2015623
	Mounting bracket for rear mounting on wall or machine, adjustable longitudinal and lateral axes, only in conjunction with mounting kit 1 (2015623)	Mounting kit 2	2015624
	Mounting bracket for rear mounting on wall, floor, or machine, adjustable longitudinal and lateral axes, only in conjunction with mounting kit 1 (2015623) and 2 (2015624)	Mounting kit 3	2015625

Other mounting accessories



	Brief description	Type	Part no.
	Strap lock	Adjustable strap lock	5306221
	Strap for mast bracket (sold by meter)	Tension strap	5306222

Terminal and alignment brackets




	Brief description	Type	Part no.
	Pole bracket requires additionally adapter bracket (2059271) or mounting set (2018303)	Mast mounting bracket	2018304

Connection systems

Modules and gateways

	Brief description	Type	Part no.
	Outdoor Ethernet-Switch, 8 ports, operating temperature range -40 °C ... +75 °C	Ethernet switch	6043482
	Indoor Ethernet-Switch, 8 ports, operating temperature range 0 °C ... +55 °C	Ethernet switch	6033013

Plug connectors and cables

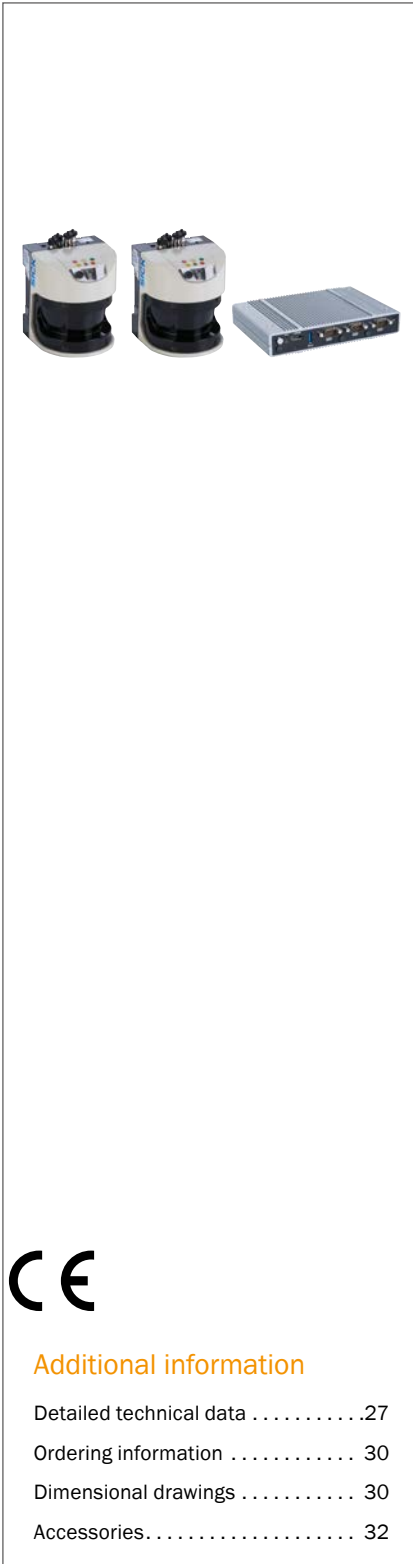
	Brief description	Type	Part no.
	4-wire, 5 m	DOL-1204-G05MACO	6054495
	4-wire, 10 m	DOL-1204-G10MACO	6054494
	4-wire, 20 m	DOL-1204-G20MACO	6050687
	3 m	Ethernet data cable	6026083
	4-wire, 5 m	SSL-2J04-G05MACO	6054493
	4-wire, 10 m	SSL-2J04-G10MACO	6054492
	4-wire, 20 m	SSL-2J04-G20MACO	6050685

Further accessories

Test and monitoring tools

	Brief description	Type	Part no.
	Scan finder, receiver to localize infrared scans	Scan-Finder LS-80L	6020756

THE BENCHMARK IN NON-CONTACT VEHICLE CLASSIFICATION



Product description

The TIC502 (Traffic Information Controller) profiling system classifies vehicles in free-flowing traffic with high precision. The vehicles are scanned up to 100 times a second using eye-safe laser beams. The measurement data recorded is used to generate a 3D model of each vehicle. The TIC502 uses this data-

base to assign up to 30 vehicle classes. The system can be expanded to include the axle counting function using an additional 2D LiDAR sensor. Thanks to the modular software and the web-based configuration and user interface, the TIC502 is easy to set up and operate.

At a glance

- Highly precise classification in up to 30 different vehicle classes
- Reliable in free-flowing and stop-and-go traffic
- Web-based user interface
- Works in all climate zones (-40 °C ... +60 °C) thanks to expanded temperature range
- Data history of the last 50 vehicles detected
- Can be extended to include the axle counting function

Your benefits

- Output of up to 30 vehicle classes according to TLS 8+1, TLS 5+1, TLS 2+1 or Swiss 10
- No additional software necessary for visualizing vehicle data
- Fast and easy commissioning with the configuration wizard
- Reliable function even at night and in bad weather conditions
- Data storage directly in the customer system via FTP or UNC transmission



Additional information

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→ www.sick.com/TIC502

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Detailed technical data

The exact device specifications and performance data of the product may deviate from the information provided here, and depend on the application in which the product is being used and the relevant customer specifications.

TIC502

General notes

Items supplied	LMS511 SE 2D LiDAR sensors pre-installed on a mounting plate Traffic Controller TIC with TIC software including USB Stick with TEMS info sample client, source code for TEMS info sample client, TEMS analyzer and operating instructions	LMS511 SE 2D LiDAR sensors pre-installed on a mounting plate
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Features

	TIC502 Master	TIC502 Slave
Field of application	Traffic management Toll collection	
System part	TIC502 Master (With supplied Traffic Controller TIC)	TIC502 Slave (For system extension)
System components	LMS511 SE (2 x)	
Number of covered lanes	1	
System extension	Up to 4 lanes	
Integrated application	Vehicle classification Vehicle counting Speed monitoring Axle counting	
Axle counting option	Yes, by means of additional LMS511 SE	
Scanner design	2-scanner solution	
Vehicle data	Vehicle class Driving direction Speed monitoring Lane assignment Confidence level for all vehicle datas Point cloud	
Amount of vehicle classes	Up to 30 classes	
Recommended distance between max. vehicle height and sensor	> 1.5 m,	
Stop-and-go functionality	Yes	
Max. range with 10 % reflectivity	40 m	
Laser class	1, eye-safe (IEC 60825-1:2014)	
Internal computer	Traffic Controller TIC	-
Trigger lines	Max. 20 m	

Performance

Counting accuracy	> 99.85 %
Classification accuracy	Typ. 98 % (For TLS8+1 classes)
Speed accuracy	± 3 km/h, at < 100 km/h ¹⁾ ± 3 %, at > 100 km/h ¹⁾

¹⁾ Only for vehicles with directional stability which pass under the LMS Length.

Interfaces

	TIC502 Master	TIC502 Slave
NTP synchronization	✓	
Ethernet		
Function	Operator interface, sensor interface	Sensor interface
Data transmission rate	10/100 MBit/s	-
Protocol	TEMS Info Interface (TCP/IP Interface) TEMS Manager (HTTP configuration software)	-

Mechanics/electronics

	TIC502 Master	TIC502 Slave
Supply voltage	24 V DC (22.8 V DC ... 25.2 V DC)	
Power consumption	120 W, With heating 54 W, without heating	110 W, With heating 44 W, without heating
Housing dimensions (W x D x H)	498 mm x 411 mm x 191 mm (Only mounting plate with pre-installed LMS511 SE)	
Weight	12.8 kg	12 kg
Installation position	Overhead	
Installation height	6 m, 5 m ... 8 m	

Ambient data

Ambient temperature operation	-40 °C ... +60 °C
Ambient storage temperature	-40 °C ... +70 °C

LMS511 SE

General notes

Description	Configured 2D LiDAR sensor for profiling systems used for traffic applications. Complete specifications can be found under the standard resolution LMS511-10100 PRO (1046135).
Note on use	The sensor does not constitute a safety component as defined by relevant legislation on machine safety.

Features

Field of application	Outdoor
Version	Mid Range
Resolution power	Standard Resolution
Light source	Infrared (905 nm)
Laser class	1, eye-safe (IEC 60825-1:2014)
Aperture angle	190°
Heating	Yes
Amount of evaluated echoes	5
Fog correction	Yes

Interfaces

Ethernet	✓	
Function	Host	
Data transmission rate	10/100 MBit/s	
Protocol	TCP/IP, OPC	
Optical indicators	5 LEDs (Additional 7-segment display)	

Mechanics/electronics

Electrical connection	4 x M12 round connector
Supply voltage	24 V DC (19.2 V DC ... 28.8 V DC)
Power consumption	22 W, + 55 W heating (typical)
Housing color	Gray (RAL 7032)
Enclosure rating	IP67 (EN 60529, Section 14.2.7)
Protection class	III (EN 60529, Section 14.2.7)
Weight	3.7 kg
Dimensions (L x W x H)	160 mm x 155 mm x 185 mm

Ambient data

Object remission	2 % ... > 1,000 % (reflectors)
Electromagnetic compatibility (EMC)	EN 61000-6-2:2005, EN 61000-6-3 (2007-03)
Vibration resistance	EN 60068-2-6 (1995-04)
Shock resistance	EN 60068-2-27 (1993-03), EN 60068-2-29 (1993-04)
Ambient operating temperature	-40 °C ... +60 °C
Storage temperature	-40 °C ... +70 °C
Ambient light immunity	70,000 lx

Traffic Controller TIC

General notes

Note on use	Receipt and filtering of sensor data Processing for TIC vehicle data Output of vehicle and diagnostic data via the user interface
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Features

Field of application	Indoor
Internal memory	32 GB

Interfaces

Optical indicators	LED status and function display
Ethernet	✓ (2)
Function	Operator interface, sensor interface
Data transmission rate	1 Gbit/s, for each interface
Protocol	TEMS Info Interface (TCP/IP Interface) TEMS Manager (HTTP configuration software)
Electrical connection	Connector LAN 1 (RJ45) for operator interface, connector LAN 2 (RJ45) for sensor interface
NTP synchronization	✓

Mechanics/electronics

Supply voltage	24 V DC (9 V DC ... 25 V DC)
Power consumption	10 W (typical)
Enclosure rating	IP20
Weight	0.8 kg
Housing dimensions (W x D x H)	180 mm x 121.2 mm x 33 mm
Fixing	Screwable

Ambient data

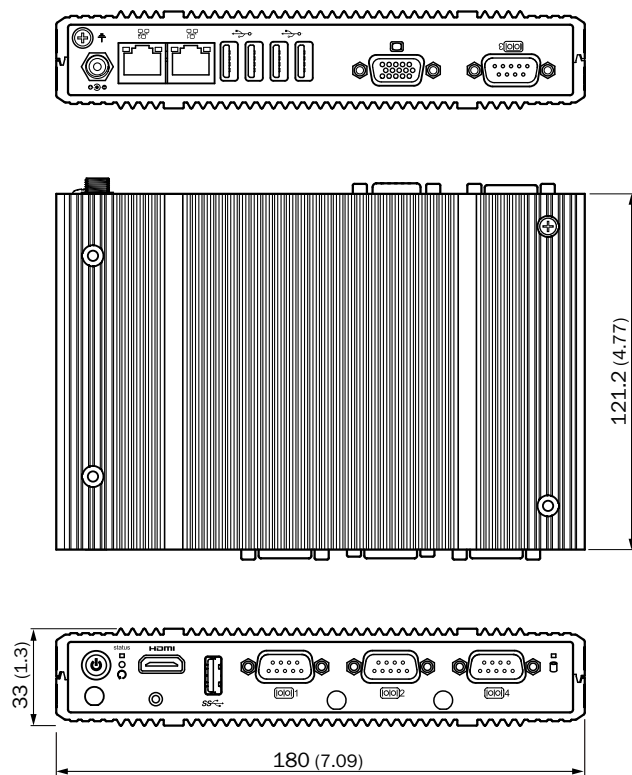
Electromagnetic compatibility (EMC)	EN 55024, EN 55022 Class A
Ambient temperature operation	-20 °C ... +60 °C
Ambient storage temperature	-20 °C ... +85 °C

Ordering information

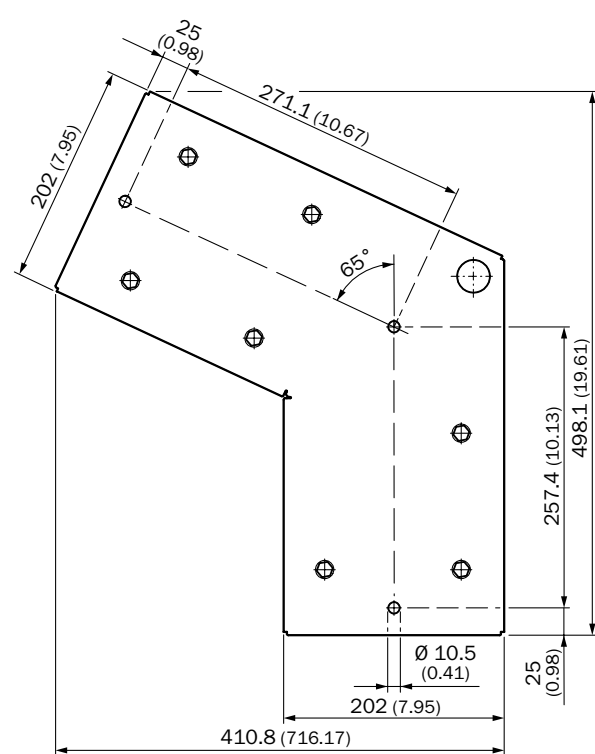
System part	Items supplied	Type	Part no.
TIC502 Master (With supplied Traffic Controller TIC)	LMS511 SE 2D LiDAR sensors pre-installed on a mounting plate Traffic Controller TIC with TIC software including USB Stick with TEMS info sample client, source code for TEMS info sample client, TEMS analyzer and operating instructions	TIC502 Master	1085137
TIC502 Slave (For system extension)	LMS511 SE 2D LiDAR sensors pre-installed on a mounting plate	TIC502 Slave	1085138

Dimensional drawings (Dimensions in mm (inch))

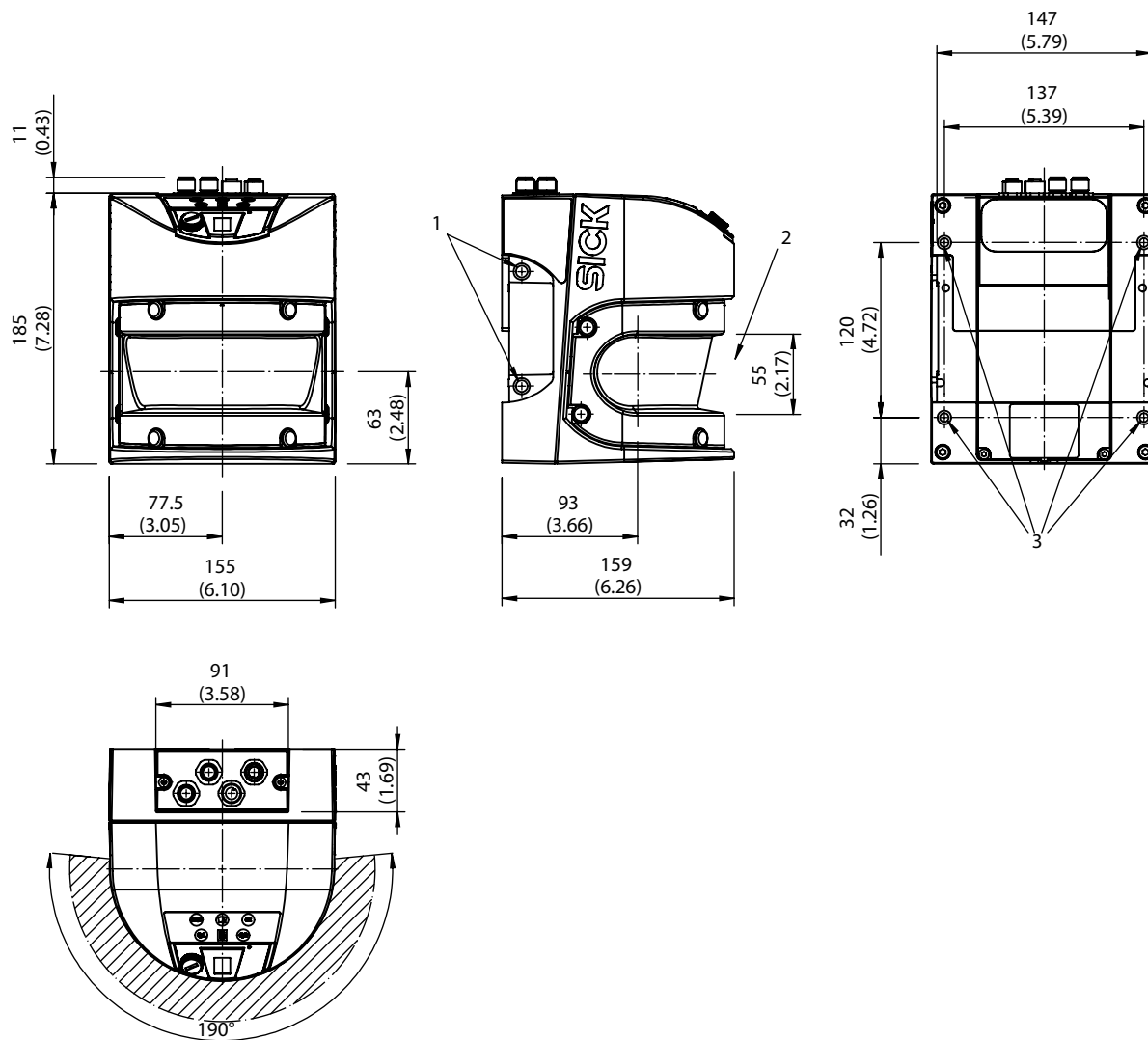
Traffic Controller TIC



Mounting plate



LMS511 SE





- ① 4 screw holes M8 x 9
- ② Do not block front screen
- ③ 4 screw holes M6 x 8






Accessories

Mounting systems

Device protection (mechanical)



	Brief description	Type	Part no.	TIC502 Master	TIC502 Slave	LMS511 SE	Traffic Controller/TIC
	Protection hood	Protection cover	2056850	-	-	●	-
	Weather hood (180°), vertical mounting	Weather hood	2063050	-	-	●	-

Mounting brackets and plates




	Brief description	Type	Part no.	TIC502 Master	TIC502 Slave	LMS511 SE	Traffic Controller/TIC
	Mounting bracket for LMS5xx (for retrofitting, if 2018303 is already in use)	Mounting bracket	2059271	-	-	●	-
	Mounting kit for wall-mounting (adjustment bracket), steel, zinc coated	Mounting kit	2018303	-	-	●	-
	Mounting bracket for direct mounting, from the rear, on wall or machine, not adjustable	Mounting kit 1	2015623	-	-	●	-
	Mounting bracket for rear mounting on wall or machine, adjustable longitudinal and lateral axes, only in conjunction with mounting kit 1 (2015623)	Mounting kit 2	2015624	-	-	●	-
	Mounting bracket for rear mounting on wall, floor, or machine, adjustable longitudinal and lateral axes, only in conjunction with mounting kit 1 (2015623) and 2 (2015624)	Mounting kit 3	2015625	-	-	●	-

Connection systems

Modules and gateways


	Brief description	Type	Part no.	TIC502 Master	TIC502 Slave	LMS511 SE	Traffic Controller/TIC
	Outdoor Ethernet-Switch, 8 ports, operating temperature range -40 °C ... +75 °C	Ethernet switch	6043482	●	●	-	-
	Indoor Ethernet-Switch, 8 ports, operating temperature range 0 °C ... +55 °C	Ethernet switch	6033013	●	●	-	-


Plug connectors and cables

	Brief description	Type	Part no.	TIC502 Master	TIC502 Slave	LMS511 SE	Traffic Controller/TIC
	4-wire, 5 m	DOL-1204-G05MACO	6054495	●	●	●	-
	4-wire, 10 m	DOL-1204-G10MACO	6054494	●	●	●	-
	4-wire, 20 m	DOL-1204-G20MACO	6050687	●	●	●	-
	3 m	Ethernet data cable	6026083	●	●	-	●
	4-wire, 5 m	SSL-2J04-G05MACO	6054493	●	●	●	-
	4-wire, 10 m	SSL-2J04-G10MACO	6054492	●	●	●	-
	4-wire, 20 m	SSL-2J04-G20MACO	6050685	●	●	●	-

Further accessories

Test and monitoring tools

	Brief description	Type	Part no.	TIC502 Master	TIC502 Slave	LMS511 SE	Traffic Controller/TIC
	Scan finder, receiver to localize infrared scans	Scan-Finder LS-80L	6020756	●	●	●	-

	Type	Part no.	TIC502 Master	TIC502 Slave	LMS511 SE	Traffic Controller/TIC
	LMS511 SE	1091458	●	●	-	-

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