



# sX – Traffic Light Controller

The innovative solution that grows along with your needs

YUNEX  
TRAFFIC

# Small and simple or complex and sophisticated – sX is a traffic controller that can be both.

Setting parameters for traffic signal systems using a smartphone or tablet computer? With sX, this is no longer a futuristic scenario: The traffic controller can be easily operated via the Web while meeting the highest security standards and availability requirements. For all its simplicity, sX covers a wide range of applications: It can be used as a stand-alone solution without connection to sensors and a higher-level traffic control system or works smoothly as an integral part of the extensive traffic management system of a large city.

## Accessibility – secure communication between control center and Web interface

Right through the Web interface of the controller's processor a secure connection can be established from the Scala or smartGuard control centers. Hence, in terms of secure access, it makes no difference whether you choose to check the operating details of the controller directly on site or from the convenience of your office desk. For those who are

looking for a compact solution that will meet their complex traffic control requirements or who are planning to expand their existing solution, sX offers a range of useful new features.

## The new version of sX – more powerful than ever

The functions for "Advanced Traffic Engineering (ATE)" and "Advanced Traffic Management (ATM)" make it possible to use sX for sophisticated control, with numerous highlight functions such as the connection of up to four partial nodes, the PDMx control method, integrated planning and data supply via Office as well as parameterizable signal monitoring functions. What is more, sX is also equipped for modern traffic management: The open system architecture enables seamless connection to third-party control centers, supporting various standard protocols, e.g. OCIT, as well as the project-specific implementation of additional protocols from local development partners.

## The new sX Plus: sX is now also available for the decentralized technology

The newly developed sX Plus completes our controller portfolio in the field of decentral installations. During the development phase we paid special attention to backward compatibility. This means, that all existing Plus installations – 24V & 40V LED-technology and 10V lamp technology – can be operated with the new sX Plus without changing the signal heads.

### Some key facts about sX Plus:

- Available for new or existing installations of 40V and 24V LED systems and as migration path for 10V lamp systems
- 64 signal groups from factory, project-specific 96 possible
- Up to 8 cables per system, 1-4 cable strings per gateway, 1-15 modules per cable string
- Maximal system fits into 2U cabinet (Main frame + expansion frame)



**The latest in Web technology allows easy operation of sX at any time and from anywhere. The newest version offers a whole range of additional useful functions that will help you prepare perfectly for tomorrow's tasks.**





**Traffic control made easy: sX is equipped for intuitive and convenient operation via the Internet. The sophisticated controller uses modern software architecture and features automated data synchronization between traffic center and controller.**



# Lean structure, easy configuration and unparalleled user-friendliness – sX is setting new standards.

## Usability – from direct Web access to error memory

No tools, no software to install – just open your Web browser and start using the device! HTML5 enables easy and user-friendly access to the Web user interfaces of the sX controller. Even customization or the implementation of project-specific content becomes easy with modern HTML5 interfaces. And innovative features such as an intuitive error memory are no longer wishful thinking but have been developed and integrated in sX. The Web user interface meets the high requirements of IT security.

## Over-the-air updates – unique processor architecture

A processor innovation complements the idea of remote operation: In addition to the main CPU, a dedicated real-time processor can take over control if required, as a kind of “hot standby”. This not only maximizes the availability of the intersection control system, but also enables full over-the-air (OTA) firmware updates of all sX controllers in the field. Especially in times of ever stricter IT security requirements and breathtakingly fast hardware and software innovation cycles, this innovative idea helps prepare the device for future challenges.

## Maintenance – less downtimes with emergency fallback processor

The sX is designed for easiest maintenance while improving the system availability.

With the integrated emergency fallback processor maintenance can be done on a live system. For most service works no shutdown of the intersection is required.

The high integration of the sX still allows for easy snap in montage of all components. Even active backplanes can be removed by loosening only three screws.

## Openness – API interface for local applications

The modern software architecture of the sX controller also includes an Application Programming Interface (API) for connection to customer-specific applications. For this purpose, an attractive development landscape including API documentation, virtual machine and application examples for Java Eclipse can be made available to certified partners. This interface has been developed especially for the integration of customer-specific control philosophies and control center linkups as well as for auxiliary functions such as data exchange with third-party systems (e.g. Car2X). Thanks to this unique, cutting-edge software architecture, the sX controller is open for the integration of additional applications and perfectly prepared for future technological developments.

## High IT security

As a supplier of traffic technology, Yunex Traffic is certified to the international information security management standard ISO/IEC 27001. All Yunex products, systems and services are developed, integrated, and operated in this certified environment.

As a result, potential IT threats are systematically identified, analyzed, and monitored and the right IT security technologies and processes are implemented to effectively and efficiently minimize the risks. One of our key objectives is the continuous improvement of IT security.

# Ultra-modern hardware and innovative software – a combination that equals future-proof solutions for your traffic planning.

Whether intuitive user interfaces, ever more powerful processors or state-of-the-art hardware: When using Yunex Solutions, municipal authorities can be confident that they have the latest technology at their fingertips. With all that, our focus is always on providing optimum customer benefit – modular, powerful solutions with a high safety and security factor!

## Ultra-modern hardware design – modular and based on the latest technologies

The sX controller scores with its unique ease of installation, minimal wiring effort and modular design for flexible extension. From the basic configuration for the control of eight signal groups, the controller can be expanded to control a huge array of more than 64 signal groups and more than 250 detectors.

We have made use of our decades of experience to completely redesign the hardware: All components and processors are state-of-the-art, which ensures an extended lifecycle, especially since precision and reliability have always characterized Yunex products – even under the most challenging operating conditions.

Yunex offers three controller hardware versions, perfectly adapted to 117 V/230V, 40V und 24V signal heads. The latest innovation is the sX-P for Plus Technology, available for 24V and 40V LED technology and also 10V lamp technology.

## The sX controller family

<b>sX-H 230V</b>	The basic controller for 230V LED signal heads with an especially low energy consumption level of 5–18W per signal head
<b>sX-HC 230V</b>	The compact controller for 230V LED signal heads, with LED control board and up to 8 signal groups
<b>sX-L 40V</b>	The standard controller for 40V LED signal heads that scores with highly flexible hardware design and software functionality
<b>sX-LC 40V</b>	The compact controller for 40V LED signal heads, with LED control board and up to 32 freely assignable outputs
<b>sX-V 24V</b>	The controller for 1Watt technology that scores with minimum energy consumption and the highest security level
<b>sX-VC 24V</b>	The compact controller for 1Watt technology, with LED control board and up to 32 freely assignable outputs
<b>sX-P 24V / 40V</b>	The new controller for decentral installations for the 1Watt technology, 40V LED and 10V lamp technology.

Shared data	sX-H, sX-L, sX-V and sX-P
Legislation, standards, directives	<ul style="list-style-type: none"> <li>• DIN VDE 0832-100 (EN 50556)</li> <li>• RiLSA 2010 (EN 12675) *</li> <li>• DIN VDE 0832-200 (EN 50293)</li> <li>• DIN VDE V 0832-500 **</li> <li>• CE marking (includes EMC and Low-Voltage Directive LVD)</li> <li>• EN 61508 **</li> </ul>
Ambient temperature limits	–40 °C to +60 °C ambient temperature
Power consumption of control unit	Typ. 28W, max. 75W
Signal groups	64 signal groups (more if needed for a specific project)
Partial nodes	Up to 4 partial nodes
Detectors, inputs/outputs	<ul style="list-style-type: none"> <li>• 4-channel detectors (SLD4)</li> <li>• Video detector (DIB-E)</li> <li>• FLIR Video and thermal detectors (DIB-T)</li> <li>• Radar technology and Yutrafic Wimag (CIE)</li> <li>• High voltage input/output (CIAC)</li> <li>• AFD for receiving R09 telegrams</li> </ul>
Acknowledgement devices for signal transmitters for the blind	Compatible with various makes and models
Pedestrian signal request devices	Compatible with various makes and models
Interfaces	<ul style="list-style-type: none"> <li>• 3 x Fast Ethernet</li> <li>• 1 x USB</li> <li>• 1 x SD card</li> <li>• 9 serial interfaces (onboard)</li> <li>• 9 additional serial interfaces when CEB expansion module is installed</li> </ul>
Signal monitoring	<ul style="list-style-type: none"> <li>• Two-channel setup based on fail-safe components **</li> <li>• Monitoring of dangerous signaling states as per DIN EN 50556/EN 12675 *</li> <li>• Alarm message in the event of contradictory signaling states and defective light sources</li> <li>• Monitoring function using individual red-light sensors and total-current sensors *</li> </ul>
System clock pulse	1 s
Timer	<ul style="list-style-type: none"> <li>• NTP time server</li> <li>• GPS</li> <li>• RTC (quartz clock pulse)</li> </ul>
Backup concept	<ul style="list-style-type: none"> <li>• Data recorded over a long period of time, stored on a correspondingly large SD card memory</li> <li>• Data supply can be defined separately for each archive</li> </ul>
Control centers	<ul style="list-style-type: none"> <li>• Canto (UMTS &amp; Ethernet)</li> <li>• OCIT-O up to V3.0 (Ethernet)</li> <li>• smartGuard ASP</li> <li>• RSMP</li> <li>• Scats</li> <li>• VnetS, OZS3</li> </ul>

\* for sX-P valid with restrictions

\*\* for sX-P not certified

<b>Shared data</b>	<b>sX-H, sX-L, sX-V and sX-P</b>
Types of control	<ul style="list-style-type: none"> <li>• Central control mode</li> <li>• Local mode</li> <li>• Manual mode</li> <li>• Automatic annual switching routine</li> <li>• Phase coordination</li> </ul>
Off state	<ul style="list-style-type: none"> <li>• Off mode for each partial node</li> <li>• Off-amber flashing and Off-all amber flashing</li> <li>• Off-dark and Off-all flashing</li> </ul>
On/Off switching	Signaling states freely selectable, signal-plan-based On/Off switching patterns
Signal sequences, vehicles/pedestrians	All signal sequences possible
Flashing pulse	1 Hz or 2 Hz
Data logging	Polling of detector inputs at intervals of 10 ms, with configurable plausibility check
Operator control/data supply	<ul style="list-style-type: none"> <li>• Manual control unit, functions as per DIN EN 50556 (VDE 0832-100, DIN VDE 0832-110) with 4-line LCD display for fast and easy information on operating states and system events</li> <li>• Extended range of configuration options and extra flexibility with Yutrafic Office</li> <li>• Modification of key parameters (e.g. automatic annual switching routine, signal timing) via the sX Web interface</li> <li>• Full range of diagnostic functions via the sX Web interface</li> </ul>
Web interface	<ul style="list-style-type: none"> <li>• sX HTML 5 Web interface offering all functions required for monitoring, operation and diagnosis</li> <li>• Data supply and modification of key parameters (automatic annual switching routines, phases, signal plan times)</li> <li>• Detector simulation</li> <li>• Plug &amp; play functionality</li> <li>• Supports easy commissioning with integrated tools such as IBS Wizard &amp; Wiring Check</li> <li>• New and even more informative display of status information</li> </ul>
Traffic-actuated control	<ul style="list-style-type: none"> <li>• Programmable logic with Yutrafic Office – Traffic Language (structograms/flowcharts)</li> <li>• PDMx control method, module library for phase control with distributed modification</li> <li>• Supports also other methods, such as OML, VS Plus, Norra, FESA, Stride</li> </ul>



Model-specific data	Yuttraffic sX-H	Yuttraffic sX-L	Yuttraffic sX-V
Mains supply voltage	<ul style="list-style-type: none"> <li>230V AC (–20 %/+15 %)</li> <li>117V AC (–20 %/+15 %) for export</li> </ul>	230V AC (–20 %/+15 %)	<ul style="list-style-type: none"> <li>230V AC (–20 %/+15 %)</li> <li>117V AC (–18 %/+15 %) for export</li> </ul>
Lamp switch types	<ul style="list-style-type: none"> <li>VDE 230V, LED 5-18 W</li> <li>117V (LSHS), LED 3-9 W</li> </ul>	VDE 40V (LSLS), LED 5-9 W, as per OCIT <sup>®</sup> specification	VDE 24V (LSVS) LED 1-3 W
Lamp types/signal head types	<ul style="list-style-type: none"> <li>230V LED signal head (5-18 W), dimming function (150 V AC) – VDE not applicable</li> <li>117V LED signal head (3-9 W)</li> <li>Third-party products require prior approval</li> </ul>	<ul style="list-style-type: none"> <li>40V LED signal head (5-9 W), dimming function (27 V AC/DC) - VDE not applicable</li> <li>Third-party products require prior approval</li> </ul>	<ul style="list-style-type: none"> <li>24V LED signal head (1-2 W), no dimming function</li> <li>Third-party products require prior approval</li> </ul>
Technical data of lamp switching module	<ul style="list-style-type: none"> <li>Connection of 5-18 W (230V) LED signal heads</li> <li>Connection of 3-9 W (117V) LED signal heads</li> <li>Up to 256 lamp outputs</li> <li>One lamp switching module features 32 outputs with 24 switching elements</li> <li>Each module features 8 signal groups with 3 aspects red/amber/green, plus dual-channel sensor technology</li> <li>Each output is equipped with three terminals</li> </ul>	<ul style="list-style-type: none"> <li>Connection of 5-9 W (40V) LED signal heads</li> <li>Up to 256 lamp outputs</li> <li>An LSLS features 32 outputs with 32 switching elements</li> <li>Each output is current-monitored in dual-channel sensor technology</li> <li>No fixed signal states assigned to the outputs; any aspect can be assigned the states Disabled, Enabled, Transition</li> <li>Each output is equipped with three terminals</li> </ul>	<ul style="list-style-type: none"> <li>Connection of 1-3 W (24V) LED signal heads</li> <li>Up to 256 lamp outputs</li> <li>An LSVS features 32 outputs with 32 switching elements</li> <li>Each output is current-monitored in dual-channel sensor technology</li> <li>No fixed signal states assigned to the outputs; any aspect can be assigned the states Disabled, Enabled, Transition</li> <li>Each output is equipped with three terminals</li> </ul>
Fuse protection for signal heads (lamp load)	<ul style="list-style-type: none"> <li>6.3 A per lamp switching module</li> <li>1 A per color output</li> </ul>	<ul style="list-style-type: none"> <li>20 A per lamp switching module</li> <li>Electronic fuse for each color output</li> </ul>	<ul style="list-style-type: none"> <li>Max. 120 W per lamp switching module (32 LED switches)</li> <li>Max. 12 W per load switch for color output</li> </ul>
Max. permissible total load (lamp load)	2.76 kVA for 230 V (12 A)	1.0 kVA for 40 V (25 A)	0.4 kVA for 24 V (25 A)
Dimming (countries where VDE does not apply)	Yes	Yes	No
Signal head cabling	<ul style="list-style-type: none"> <li>Generally 1.5 mm<sup>2</sup></li> <li>1 return per signal head recommended</li> <li>1 return per signal group as an alternative option</li> </ul>	<ul style="list-style-type: none"> <li>Generally 1.5 mm<sup>2</sup></li> <li>1 return per signal head recommended</li> <li>VE: 1 return per 2 signal heads as an alternative option</li> <li>PE: 1 return per signal group as an alternative option</li> </ul>	<ul style="list-style-type: none"> <li>Generally 1.5 mm<sup>2</sup></li> <li>1 return per signal head recommended</li> <li>VE: 1 return per 2 signal heads as an alternative option</li> <li>PE: 1 return per signal group as an alternative option</li> </ul>

Model-specific data	Yuttraffic sX-P 24V	Yuttraffic sX-P 40V	Yuttraffic sX-P 10V
Mains supply voltage	<ul style="list-style-type: none"> <li>230V AC (–20 %/+15 %)</li> </ul>	<ul style="list-style-type: none"> <li>230V AC (–20 %/+15 %)</li> </ul>	<ul style="list-style-type: none"> <li>230V AC (–20 %/+15 %)</li> </ul>
Peripheral lamp switching module types	LMV for max. <ul style="list-style-type: none"> <li>2x vehicle signal heads (VE)</li> <li>1x pedestrian signal head (PE)</li> </ul> FDV for max. <ul style="list-style-type: none"> <li>2x vehicle signal heads (VE)</li> <li>2x pedestrian push button with acknowledgement</li> </ul>	LML for max. <ul style="list-style-type: none"> <li>2x vehicle signal heads (VE)</li> <li>1x pedestrian signal head (PE)</li> </ul> FDL for max. <ul style="list-style-type: none"> <li>2x vehicle signal heads (VE)</li> <li>2x pedestrian push button with acknowledgement</li> </ul>	LMP for max. <ul style="list-style-type: none"> <li>2x vehicle signal heads (VE)</li> <li>1x pedestrian signal head (PE)</li> </ul> FDP for max. <ul style="list-style-type: none"> <li>2x vehicle signal heads (VE)</li> <li>2x pedestrian push button with acknowledgement</li> </ul>
Signal head/lamp types	24V LED VLP signal head (1 2 W), no dimming	40V LED signal head (5–9 W), no dimming	10V low voltage lamps (10.5V) <ul style="list-style-type: none"> <li>SIG 1227 Ü – 20 W</li> <li>SIG 1238 Ü – 30 W</li> <li>SIG 64032 – 20 W</li> <li>SIG 64033 – 30 W</li> <li>Lamp socket BA20S</li> </ul>
Power rating per module	40 VA per module	Depending on configuration: <ul style="list-style-type: none"> <li>60 VA when one module is configured</li> <li>120 VA when two modules are configured</li> </ul>	Master signal head: 90 VA, for short time red-yellow 150 VA
Max. permissible total load (lamp load)	<ul style="list-style-type: none"> <li>1.2 kW with 4 PLUS strings</li> <li>max. 7A per string</li> </ul>	<ul style="list-style-type: none"> <li>3.6 kW with 4 PLUS strings</li> <li>max. 7A per string</li> </ul>	<ul style="list-style-type: none"> <li>4.2 kW with 4 PLUS strings</li> <li>max. 7A per string</li> </ul>
Dimming (countries where VDE does not apply)	No	No	No
Signal head cabling	PLUS cable	PLUS cable	PLUS cable

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