

The solution
of the future

Signal control equipment
of today for the traffic
management of tomorrow



Signal control
equipment



Intersections, roundabouts and pedestrian crossings: These are the sensitive traffic nodes of today and tomorrow. Increasing traffic density requires a high degree of flexibility in traffic management. Rigid signalling systems are reaching the limit of their performance. Systems which are fully traffic controlled are the solutions of the future.

The Stührenberg family of control units has been designed with this requirement in mind. With its modern hardware and software design, the control units are flexible in programming and recommend themselves both as individual and group installations and as central control units.

The optimum solution for each traffic node

Stührenberg has a diverse programme of signal control equipment. It starts with the **FGX control system** for the "smaller" intersections and pedestrian crossings and reaches to the high-performance **STm 40**, a fully technically equipped control system for the major traffic nodes.

All control units use modern micro-processor technology and contain several independently working processors. This configuration produces maximum reliability and protection against failure.



The computers have the following individual functions assigned:

- Signal programme processing with signal indication output through control computer

- Monitoring of signals by electronic signal safety devices. The signal safety device is independent and fail-safe technology configured in accordance with VDE 0832.

- Terminals
- Interface to traffic computer

All processors are coupled via quick interfaces.



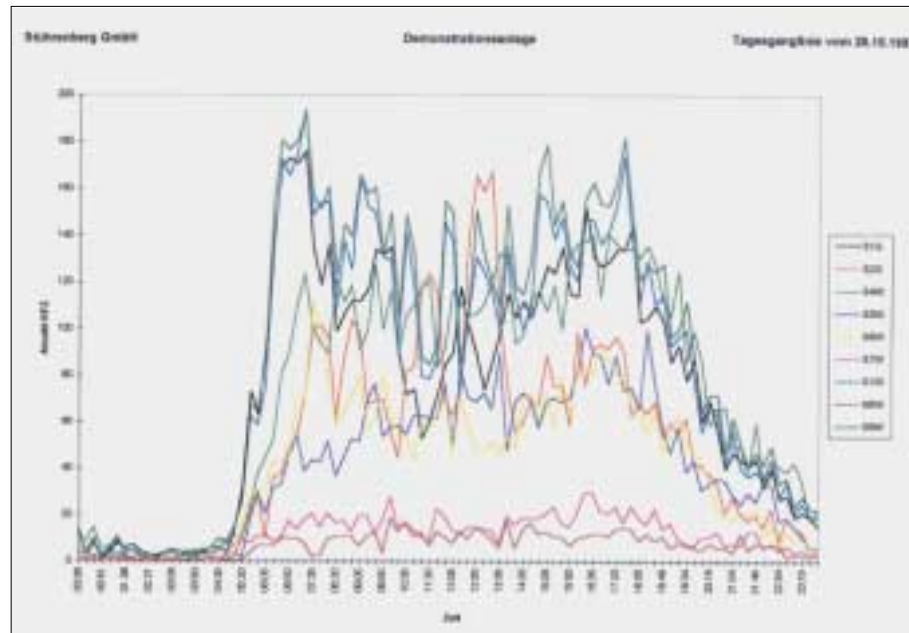
Overview of signal control equipment

	STm 40	MPX-E	EVX	FGX
Switch cabinet	■ Special sizes in plastic or aluminium	■ Size 1 or special sizes in plastic and aluminium	■ Size 1 or special sizes in plastic and aluminium	■ Size 0 or size 1 in plastic and aluminium
max. lamp performance per lamp channel	e.g. ■ 230 V:400 W ■ 230 V/10,5 V:120 W ■ others on request	e.g. ■ 230 V:400 W ■ 230 V/10,5 V:120 W ■ 40 V:160 W ■ others on request	e.g. ■ 230 V:400 W ■ 230 V/10,5 V:120 W ■ 40 V:160 W ■ others on request	e.g. ■ 230 V:400 W ■ 230 V/10,5 V:120 W ■ 40 V:160 W ■ others on request
Signal output module	up to 40 modules for connecting 120 lamp channels	up to 20 modules for connecting 60 lamp channels	up to 8 modules for connecting 24 lamp channels	up to 4 modules for connecting 12 lamp channels
Logical outputs for free programming	■ 24	■ 12	■ 12	■ 12
Logical inputs for free logic writing (independently of the loop or sensor input functions)	■ 104 parallel ■ 120 via serial interface	■ 56 parallel ■ 120 via serial interface	■ 48 parallel ■ 120 via serial interface	■ 8 loop detector inputs ■ 8 switch detector inputs in 230 V ■ 16 inputs 24 V ■ 120 via serial interface
Displays and terminals	e.g. ■ keyboard module, TAM ■ two-line LC display with keyboard, FGTAM ■ via PC terminal ■ various LED and segment displays	e.g. ■ keyboard module, TAM ■ two-line LC display with keyboard, FGTAM ■ via PC terminal ■ various LED and segment displays	e.g. ■ keyboard module, TAM ■ two-line LC display with keyboard, FGTAM ■ via PC terminal ■ various LED and segment displays	e.g. ■ two-line LC display with keyboard, FGTAM ■ via PC terminal ■ various LED and segment displays

The technology in detail

All Stührenberg **signal control units** meet the relevant standards and directives

- VDE 0832
- RiLSA
- Developed and manufactured in accordance with ISO 9001
- EMI noise emission EN 5008 1-1 (residential areas)
- EMI noise resistance EN 50082-2 (industrial areas)
- Climatic testing



Technical specifications:

Mains voltage

- 230 V/50 Hz, -20 ... +10%

Control system configuration

- 19" technology in swivelling frame
- Fully electronic
- Wiring of assembly completely via bus board
- Minimal wiring restricted to lamp outputs and installation inputs

Signal output modules

- TRIAC no-voltage switch with electrically separate voltage circuit
- One main lamp and 3 repeaters can be connected per lamp channel

Interfaces

- One RS 232 for PC
- Various for traffic computer interfaces

Clock generator

- Network synchronous with digital clock monitoring

Signal safety devices

- Configuration in fail-safe micro-processor technology
- Monitoring for occurrence of dangerous signalling states in accordance with VDE 0832
- Reporting of defective lamps
- Checking for time interval adherence of consecutive signal indications

Operating types

- Local operation
- Radio-controlled with signal plan selection and synchronisation
- Central via traffic computer or master controller

Control system types

- Time-controlled signal programme selection
- Traffic-controlled signal programme selection
- Fixed time control system
- Fully traffic-controlled control system
- Demand-driven control system
- Phase-oriented control system
- Signal group oriented control system

Connection to main frames

- Remote diagnostics and supply via switched modem
- STc main frames
- Others on request

Signal sequence

- All signal sequences are possible
- Freely defined transition and end states

Time formation

- Network clock
- DCF77 - Signal
- Quartz with internal clock

Data supply

- Via main frames
- PC direct supply
- PC remote supply

Operation and diagnostics

- Via TAM or FGTAM integrated display and operating equipment
- PC with supply and long-time recording programmes
- Externally attached operating parts, e.g. for operation by police

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+ Ausgabe der Fehlermeldungen +
+-----+
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3.251197.123143. 33.102.201. 0. 0.0.0.7.0.111.S EINSCHALTEN
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12. 21297.115851. 14.203.202. 2. 0.0.0.7.0.115.S PROGRAMMUM
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9. 21297.1029 1. 14.202.201. 8. 0.0.0.7.0.115.S PROGRAMMUM
8. 21297. 93850. 14.201.202. 2. 0.0.0.7.0.115.S PROGRAMMUM
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6. 21297. 82410. 14.203.202. 7. 0.0.0.7.0.115.S PROGRAMMUM
5. 21297. 8 9 0. 14.204.203. 2. 0.0.0.7.0.115.S PROGRAMMUM
4. 21297. 75350. 14.203.204. 7. 0.0.0.7.0.115.S PROGRAMMUM

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Demonstrationsanlage																											
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Measuring

- Detector capture
- Data measurement with time intervals and elapsed time in values of 100 ms
- Detector monitoring by plausibility checks and time monitoring

Traffic-controlled control system

- Free programming in AWEP or TRALOG

Comparison of control computers

	MAS95	MASV3
Control equipment	<ul style="list-style-type: none"> ■ FGX ■ EVX ■ MPX-E ■ STm equipment 	<ul style="list-style-type: none"> ■ FGX ■ EVX ■ MPX-E ■ STm equipment
Signal groups	<ul style="list-style-type: none"> ■ up to 64 logical signal groups can be freely programmed for the control equipment outputs 	<ul style="list-style-type: none"> ■ up to 32 logical signal groups are distributed over the control equipment outputs
Logical inputs for free logic writing independently of loop or sensor input function	<ul style="list-style-type: none"> ■ 120 parallel or serial respectively 	<ul style="list-style-type: none"> ■ 56 parallel
Laws, standards, directives	<ul style="list-style-type: none"> ■ VDE 0832 ■ ISO 9001 	<ul style="list-style-type: none"> ■ VDE 0832 ■ ISO 9001
Hardware	<p>Scaleable 32 bit technology e.g.</p> <ul style="list-style-type: none"> ■ Intel 32 bit processor ■ 33 MHz clock rate ■ 2 MB DRAM ■ 1 MB FLASH RAM ■ 512 k Byte ZERO POWER-RAM 	<ul style="list-style-type: none"> ■ 8 bit technology
Operating system	<ul style="list-style-type: none"> ■ MIRTOS: Multitasking operating system ■ OS traffic: Operating software for control of complex light signal installations 	<ul style="list-style-type: none"> ■ MASV-firmware for traffic control processing
Interfaces	<ul style="list-style-type: none"> ■ 1 RS 232 for PC supply and service ■ 1 RS 232 for input expansion e.g. public local passenger transport module 	<ul style="list-style-type: none"> ■ Optional 1 RS 232 via MPSC or FGTAM modules for PC supply and service

	MAS95	MASV3
Important programme functions	<ul style="list-style-type: none"> ■ Secure access to data through multi-user functions ■ Internal online signal recording with change-over function for error recognition ■ Programmable traffic count, e.g. 3-month recording ■ Operating journals with more than 1000 entries ■ Comprehensive public local passenger transport message store ■ Comprehensive test functions of external plant and control system ■ Complete on-site and remote supply by PC ■ Up to 20 different signal programmes with 1000 programme parameters each ■ Freely programmable switch-on, emergency shutdown and switch-off programmes ■ Switch-on and off of part-intersections if errors occur or during operation ■ Automatic restoration of power after mains failure ■ Automatic checking and correction of intermediate and minimum green periods ■ Free programming of traffic engineering logic in AWEPE or TRALOG ■ Logic checking by step and break functions 	<ul style="list-style-type: none"> ■ Optional traffic count via MPSC or FGTAM modules ■ Operating journals with more than 100 entries ■ Complete on-site and remote supply by PC ■ Up to 8 different signal programmes with 120 programme parameters each ■ Freely programmable switch-on and off programme ■ Automatic restoration of power after mains failure ■ Automatic checking and correction of intermediate and minimum green periods ■ Free programming of traffic engineering logic in AWEPE or TRALOG
Operation and diagnostics	<ul style="list-style-type: none"> ■ PC with supply and long-time recording programmes 	<ul style="list-style-type: none"> ■ PC with supply and long-time recording programmes
Measuring	<ul style="list-style-type: none"> ■ Detector capture at 10 or 20 ms intervals ■ Measuring data such as time intervals and elapsed time in values of 100 ms ■ Detector monitoring by plausibility checks and time monitoring 	<ul style="list-style-type: none"> ■ Detector capture at 10 ms intervals ■ Measuring data such as time intervals and elapsed time in values of 100 ms ■ Detector monitoring by plausibility checks and time monitoring



Responsibility in one hand:

- Technical consultation
- Traffic planning
- Engineering
- Development
- Production
- Assembly
- Maintenance
- Service

With convincing ideas, economic solutions and innovative Stührenberg technology:

Use our competence as a specialist in traffic technology!

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Signal installations

Integrated traffic control installations

Traffic computer systems

Traffic management systems

Local public transport rapid transit systems