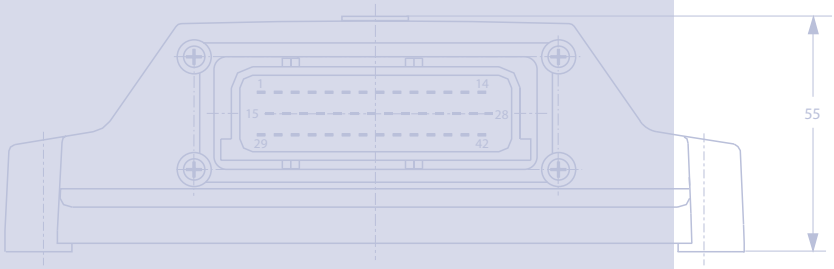
SAUER DANFOSS

S1X Mobile Microcomputer

Technical Information



S1X Mobile Microcomputer
Technical Information
Overview

DESCRIPTION

The Sauer-Danfoss S1X Mobile Microcomputer is a digital electronic, designed for open loop as well as closed loop mobile off-road system applications. State of art controls in mobile applications driving rotary and linear actuators (hydrostatic transmissions, hydraulic cylinders etc.) are to be more flexible and intelligent. The robust design of the S1X digital electronic series provides best for this.
The design provides the required performance for a mobile environment and high performance, 16 bit microcontroller provides the capability for future expansion. It is possible to load several software programs via RS232 interface for various series without any hardware change. This feature makes it possible for an unexperienced operator to use standard hardware for different applications while the appropriate software is selected.
The S1X software and hardware is developed for easy communication between the controller. Especially developed tools can be used to optimize the performance during production. This facility simplifies start-up, field service and stock.

FEATURES

- Environmentally proofed for mobile applications.
- Supply voltage 12 V_{DC} or 24 V_{DC}.
- Software changes without hardware operations.
- Individual setup per software possible.
- Visual error output (Blink code for red Error LED).
- Diagnostic functions and emergency routines.
- Communication between S1X and Laptop via RS232.
- Update Software download.

TECHNICAL DATA

Supply voltage:	12 V_{DC} or 24 V_{DC}
Battery input current:	max. 6,5 A
Sensor voltage:	5 V_{DC} up to 200 mA
LED outputs:	2 (under software control). 2 (for internal voltages). All visible from outside the enclosure.
Communication:	RS232 full buffered.
CAN Interface:	Optional Specification V2.0 Part B (active). Physical layer: Standard ISO 11898 (High-Speed)
Electrical connections:	42pin board-mounted AMP I/O connector.
Operation temperature:	-40 °C to +70 °C
Moisture:	Protected against 95 % relative humidity and high pressure wash-downs.
Vibration:	Random 50 to 2000 Hz for 2 h in each of 3 orthogonal axes at 5.58 g.
Shock:	50 g for 11 ms in all 3 axes for a total of 18 shocks.
Electrical:	The S1X is protected for short circuits to ground. The supply voltage must only be connected to the pins defined in a system connection diagram. Otherwise damage to the controller is possible. Withstands reverse polarity, over voltage, voltage transients, static discharge, EMI/RFI and load dump.

S1X-11 G2 AMP K196

I/O Functions	Description
4 Digital inputs	high side or low side switching. Selectable via software.
2 Analog inputs	0 V_{DC} to 5 V_{DC}
2 Frequency inputs	2- or 3-wire PPU. Selectable via software. 0 to 10 kHz.
2 Current feedback inputs	high current measuring up to 2 A.
4 Proportional outputs	unidirectional PWM outputs. 2 A high side switching. Can be used as digital outputs.
Controller	Intel 80C196 KC
Memory	Flash Memory: 128kByte RAM: 8kByte I^2C EEPROM: 2kByte

S1X-26 G2 AMP K196C

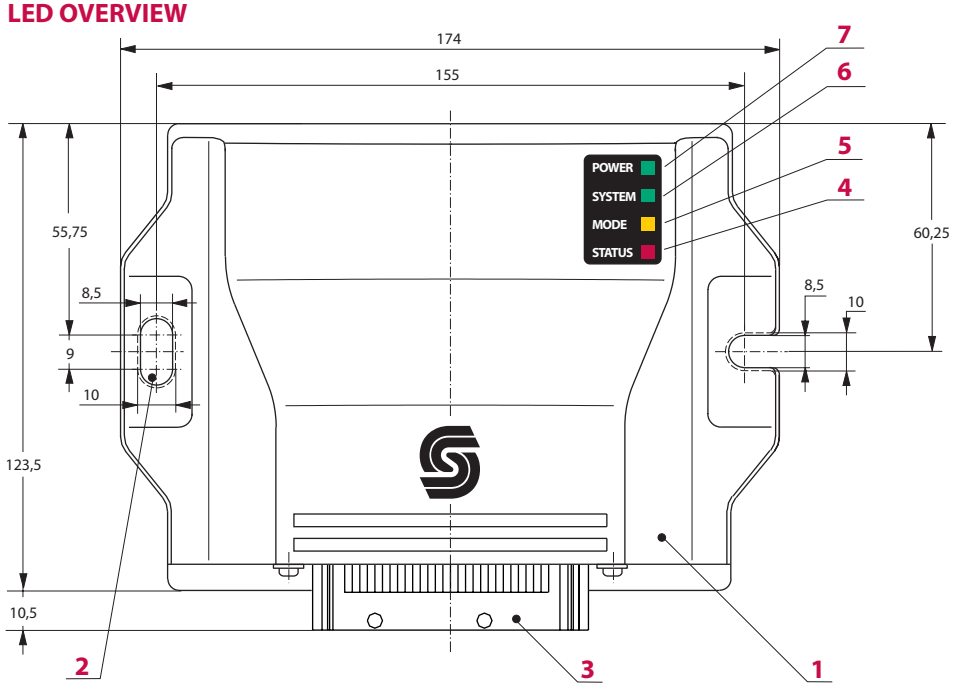
I/O Functions	Description
4 Digital inputs	high side or low side switching. Selectable via software.
2 Analog inputs	0 V_{DC} to 5 V_{DC}
2 Frequency inputs	2- or 3-wire PPU. Selectable via software. 0 to 10 kHz.
4 Configurable inputs	selectable via software. • High current measuring • Low current measuring • Analog measuring
4 Proportional outputs	unidirectional PWM outputs. 2 A high side switching. Can be used as digital outputs.
2 Configurable in-/outputs	selectable via software. • Frequency input • Proportional output
2 Digital outputs	2A high side switching.
Controller	Intel 80C196 KC
Memory	Flash Memory: 128kByte RAM: 8kByte I^2C EEPROM: 2kByte
CAN interface	Specification V2.0 Part B (active). Physical layer: Standard ISO 11898 (High-Speed)

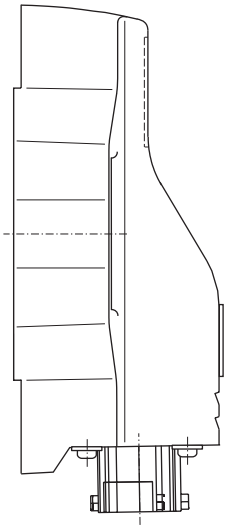
S1X-46 G2 AMP K164C

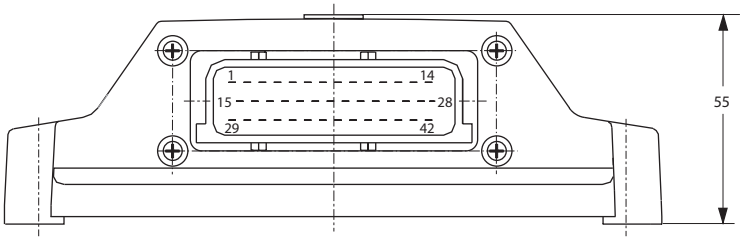
	I/O Functions	Description
4	Digital inputs	high side or low side switching. Selectable via software.
2	Analog inputs	0 V_{DC} to 5 V_{DC}
4	Frequency inputs	2- or 3-wire PPU. Selectable via software. 0 to 10 kHz.
1	Frequency input	3-wire PPU. 0 to 10 kHz.
4	Configurable inputs	selectable via software. • High current measuring • Low current measuring • Analog measuring
6	Proportional outputs	unidirectional PWM outputs. 2 A high side switching. Can be used as digital outputs.
2	Digital outputs	2A high side switching.
	Controller	Infineon SAF C164 CI-LM
	Memory	Flash Memory: 512kByte RAM: 128kByte I^2C EEPROM: 2kByte
	CAN interface	Specification V2.0 Part B (active). Physical layer: Standard ISO 11898 (High-Speed)
	Power consumption	Max. current 6.5 A overall

Dimensions

LED OVERVIEW







1	**S1X**	
2	**Mounting slots**	
3	**AMP connector**	
4	**Diagnostic LED red (STATUS)**	**Error check** Lights up if an error is detected.
5	**Diagnostic LED yellow (MODE)**	**Software check** Flashes with approx. 0.5Hz (slow) if the program is running fine. Flashes with approx. 5Hz (fast) if no program is loaded. No flashing if in setup mode.
6	**Diagnostic LED green (SYSTEM)**	**$5V_{DC}$ internal** Lights up if $5V_{DC}$ internal is O.K.
7	**Diagnostic LED green (POWER)**	**Battery after ignition switch** Lights up if the battery voltage is connected after ignition.

S01697b

ENVIRONMENTAL TESTS

EMC-Standards, MCES015

Immunity	Test principle	Severity level
Radiation (stripline) Radiation (antenna)	ISO 11452-5: 12.1995 ISO 11452-2: 12.1995	100 V/m (1 MHz - 200 MHz) 100 V/m (200 MHz - 1000 MHz)
ESD	ISO TR 10605: 10.1995	15 kV / 8 kV
Impulsive disturbances applied to supply leads	DIN 40839 part 1: 10.1992	pulse 1: -200 V pulse 2: +100 V pulse 3a: -200 V pulse 3b: +200 V pulse 4: Us -16 / -7 V pulse 5: +200 V
Impulsive disturbances applied to transmitter and signal leads	DIN 40839 part 3: 12.1991	pulse 1: -60 V pulse 2: +30 V pulse 3a: -80 V pulse 3b: +80 V

Emission	Test principle	Limit value met
(Radio interference)		
Electrical disturbance field strength	Directive 95/54/EEC	EUB/narrowband EUB/broadband
Disturbance voltage	DIN 57879 part 3: 04.1981	Degree of suppression 5 (0,15 MHz - 30 MHz) Degree of suppression 4 (87,5 MHz - 108 MHz)

Mechanical Standards, MCES015

Mechanical vibration	Test principle	Severity level
Random	DIN IEC 68-2-34	2 h in each of 3 orthogonal axes at 5.58 g 50 Hz - 2000 Hz
Resonance Search	DIN IEC 68-2-34	10 Hz - 2000 Hz at the rate of 1 octave per minute 4 g throughout sweep
Resonance Dwell time:	DIN IEC 68-2-34	4 g throughout sweep 5 minutes dwell time
Mechanical Shock	DIN IEC 68-2-27	3 shocks in each direction of the three major orthogonal axes 50 g throughout sweep with 11 ms

Temperature test	Test principle	Severity level
Temperature shock:	DIN IEC 68-2-38	+70 °C max. temperature -40 °C min. temperature 1 h dwell time 24 h test cycle time

Salt test	Test principle	Severity level
Salt spray:	DIN IEC 68-2-52	5 % NaCl at 35 °C / 72 h

Notes

SAUER DANFOSS

Our Products

Open circuit axial piston pumps

Gear pumps and motors

Fan drive systems

Closed circuit axial piston pumps and motors

Bent axis motors

Hydrostatic transmissions

Transit mixer drives

Hydrostatic transaxles

Electrohydraulics

Integrated systems

Microcontrollers and software

PLUS+1™ GUIDE

Displays

Joysticks and control handles

Sensors

Orbital motors

Inverters

Electrohydraulic power steering

Hydraulic power steering

Hydraulic integrated circuits (HIC)

Cartridge valves

Directional spool valves

Proportional valves

Sauer-Danfoss Mobile Power and Control Systems – Market Leaders Worldwide

Sauer-Danfoss is a comprehensive supplier providing complete systems to the global mobile market.

Sauer-Danfoss serves markets such as agriculture, construction, road building, material handling, municipal, forestry, turf care, and many others.

We offer our customers optimum solutions for their needs and develop new products and systems in close cooperation and partnership with them.

Sauer-Danfoss specializes in integrating a full range of system components to provide vehicle designers with the most advanced total system design.

Sauer-Danfoss provides comprehensive worldwide service for its products through an extensive network of Global Service Partners strategically located in all parts of the world.

Local address:

Sauer-Danfoss (US) Company
2800 East 13th Street
Ames, IA 50010, USA
Phone: +1 515 239-6000
Fax: +1 515 239 6618

Sauer-Danfoss GmbH & Co. OHG
Postfach 2460, D-24531 Neumünster
Krokamp 35, D-24539 Neumünster, Germany
Phone: +49 4321 871-0
Fax: +49 4321 871 122

Sauer-Danfoss ApS
DK-6430 Nordborg, Denmark
Phone: +45 7488 4444
Fax: +45 7488 4400

Sauer-Danfoss-Daikin LTD.
Shin-Osaka TERASAKI 3rd Bldg. 6F
1-5-28 Nishimiyahara, Yodogawa-ku
Osaka 532-0004, Japan
Phone: +81 6 6395 6066
Fax: +81 6 6395 8585

BLN-96-9912-E • Rev G • Oct 2002

www.sauer-danfoss.com