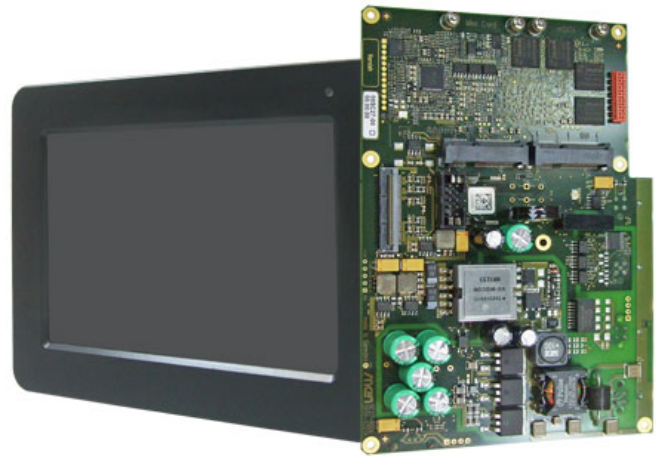


SC27 – Intel® Atom™ SBC for Intelligent Displays

- For LCD TFT panels from 7" to 15"
- LVDS up to 1280 x 768
- Intel® Atom™ E600 series, up to 1.6 GHz
- Up to 2 GB DDR2 SDRAM
- 1 Fast Ethernet (PoE Class 0) on M12
- 1 USB 2.0 (M12), 1 USB 2.0 (Type A)
- 1 PCIe® MiniCard and 1 microSIM card slot
- 1 GPS interface
- 1 SA-Adapter™ slot for UART or CAN
- 1 mSATA and 1 microSD™ slot
- 24 VDC/36 VDC nom. (10 to 50.4 V) class S2
- -40 to +85°C operating temperature
- EN 50155 compliant (railways)
- Prepared for e1 certification (automotive)

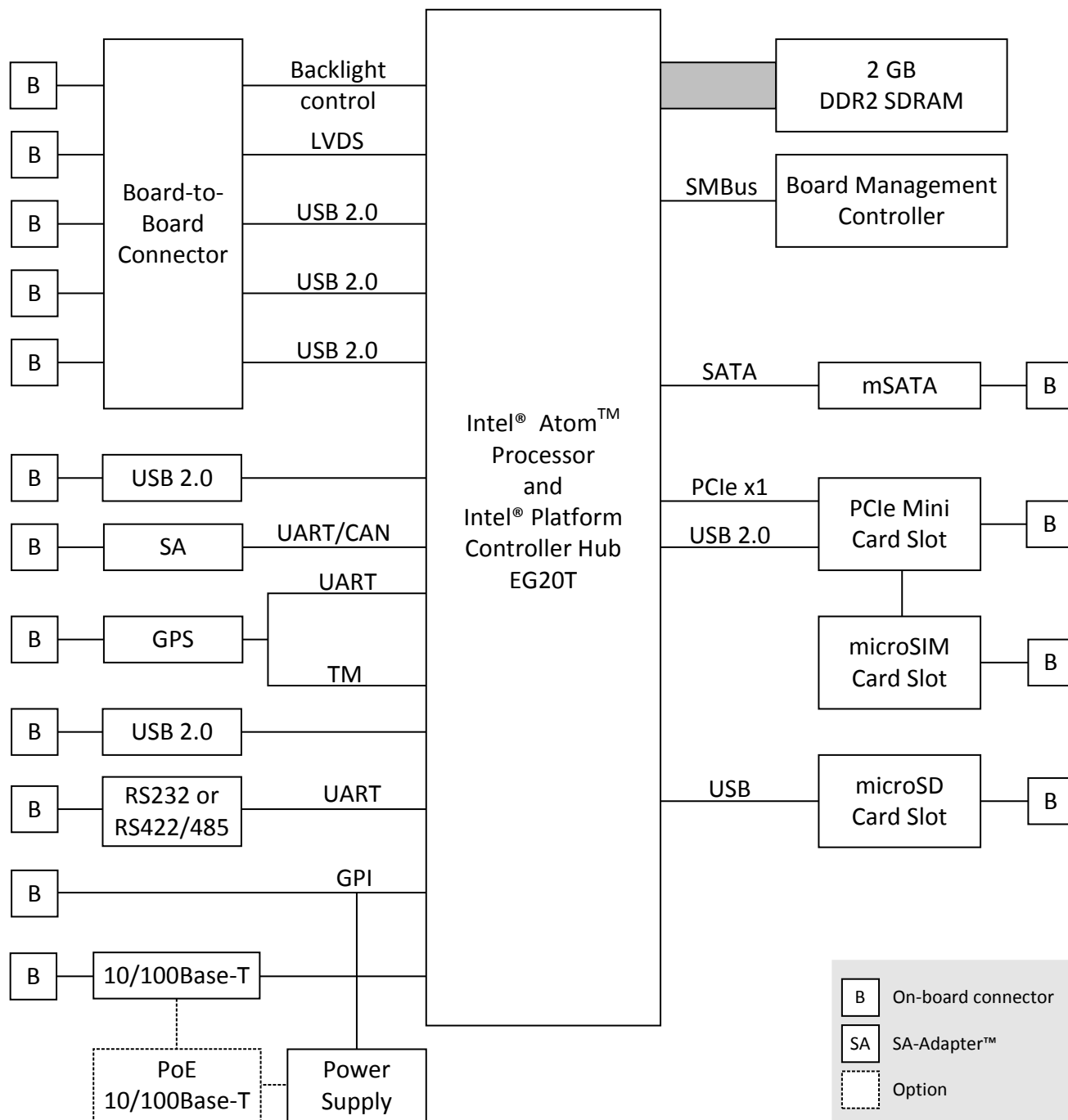


The SC27 is a rugged, fanless and maintenance-free single-board computer for rugged display computers, e.g., for in-seat infotainment purposes in trains, public buses or airplanes. Its small size makes it suitable for display devices with TFT LCD panels as small as 7". The SC27 is controlled by an Intel® Atom™ Tunnel Creek E6xx processor running at 1.6 GHz and comes with 2 GB of DDR2 SDRAM and a MicroSD card slot. The standard interfaces comprise one Fast Ethernet (via M12 connector), two USB ports as well as a GPS and RS232 or RS422/485 interface. Further I/O can be added via SA-Adapters™. A temperature sensor is provided to monitor and control the display. The board's microSIM card slot and the microSD™ card slot can be made accessible on the display computer.

The SC27 is equipped with an internal 10 to 50.4 V (24 VDC nom. or 36 VDC nom.) wide-range power supply and able to operate in a -40 to +85°C environment with sufficient cooling. Optionally the SC27 can be supplied by a power over ethernet source with a power range of 37 to 57 V (48 VDC nom.). The SC27 provides EN 50155 conformity, which makes it ideal for any kind of railway application. All electronic components are soldered to withstand shock and vibration and prepared for conformal coating.

Options include other types of the Intel® Atom™ E6xx series and a CAN bus interface via an SA-Adapter™. A PCI Express® Mini Card slot (with a microSIM card slot) in combination with an external antenna can be used to incorporate wireless functions like WIFI, WIMAX, GSM/GPRS, UMTS, HSDPA and LTE.

Diagram



Technical Data

CPU	■ Intel® Atom™ E680T □ 1.6 GHz processor core frequency ■ Chipset □ Intel® EG20T Platform Controller Hub (PCH)
Memory	■ 2 GB DDR2 SDRAM system memory □ Soldered □ 800 MHz memory bus frequency ■ 16 Mbits boot Flash ■ mSATA disk slot □ Connected via one SATA channel □ SATA Revision 2.x support □ Transfer rates up to 300 MB/s (3 Gbit/s) ■ One microSD™ card slot □ Via USB
Graphics	■ Integrated in Intel® Atom™ processor ■ One single-channel LVDS interface via Board-to-Board connector □ For connection to a display adapter board □ 80 MHz maximum pixel clock □ Maximum resolution of up to 1280x768 @ 60 Hz
PCI Express® Mini Card slot	■ PCI Express® and USB interface ■ microSIM card slot
GPS Interface	■ 48-channel GPS (Global Positioning System) receiver based on SiRF® IV ■ GPS Band/Code: L1 frequency, C/A code, SPS ■ Integrated TCXO, RTC ■ Time mark signal is readable by application software ■ Accuracy (unaided): □ Position: 2.5 m (CEP50) □ Velocity: 0.01 m/s (50%) □ Time: 1 µs (typ.) ■ Time To First Fix (TTFF): □ Cold start: 35 s typ. □ Warm start: 35 s typ. □ Hot start: 1 s typ. ■ Sensitivity: □ Acquisition (cold): -147 dBm □ Re-Acquisition: -162 dBm □ Tracking: -163 dBm ■ Protocol: NMEA 0183 (configurable to SiRF® binary OSP) ■ One U.FL antenna connector □ For the use of an external active or passive antenna □ Connected via UART □ Data transfer rate configurable (default: 4800 baud 8N1)

Technical Data

I/O	■ USB □ One USB 2.0/1.1 port via Type A connector □ One USB 2.0/1.1 port via M12 connector □ OHCI (USB1.1) and EHCI (USB2.0) implementation □ Data rates up to 12 Mbit/s (for USB1.1) □ Data rates up to 480 Mbit/s (for USB2.0) ■ Ethernet □ One 10/100Base-T Ethernet channel □ Accessible via M12 connector □ Power over Ethernet Class 0 optional ■ One RS232 UART □ Accessible via M12 connector □ RS422/RS485 optionally available □ ESD protected ■ One UART for SA-Adapter™ slot □ Supports one UART SA-Adapter™ (SA1, SA2, SA3 or SA22) □ CAN SA-Adapter™ (SA8) optionally available ■ One GPI line (General Purpose Input) □ Accessible via M12 power input connector
Intelligent Power Supply with Board Management Controller	■ Voltage supervision ■ Temperature supervision via sensor ■ Backlight control □ 12 V backlight supply □ Backlight enable, backlight dimming ■ Real-time clock with buffer functionality via supercapacitor ■ Watchdog ■ Accessible via SMBus
Power over Ethernet Features	■ PD (powered device) ■ Supports supply class 0
Electrical Specifications	■ Supply voltage/power consumption: □ +24 VDC/+36 VDC nom. (10..50.4 V), 10.8 W typ □ +110 VDC nom. (66..154 V), 10.8 W typ (optional) □ +48 VDC nom. (37..57 V), 10.8 W typ (optional power supply via Power over Ethernet) □ EN 50155 power interruption class S2
Mechanical Specifications	■ Dimensions: 160 mm x 110 mm x 44 mm ■ Weight: 164 g
Environmental Specifications	■ Temperature range (operation): □ -40..+85°C (screened or with qualified components) ■ Temperature range (storage): -40..+85°C ■ Relative humidity (operation): max. 95% non-condensing ■ Relative humidity (storage): max. 95% non-condensing ■ Altitude: -300 m to +3000 m ■ Shock: 50 m/s², 30 ms (EN 61373) ■ Vibration (function): 1 m/s², 5 Hz - 150 Hz (EN 61373) ■ Vibration (lifetime): 7.9 m/s², 5 Hz - 150 Hz (EN 61373) ■ Conformal coating on request
MTBF	■ tbd h @ 40°C according to IEC/TR 62380 (RDF 2000)
Safety	■ Flammability □ PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers

Technical Data

EMC Conformity	■ EN 50121-3-2 (table 4, 5 and 6) / EN 55011 (radio disturbance) ■ EN 50121-3-2 (table 9) / EN 61000-4-2 (ESD) ■ EN 50121-3-2 (table 9) / EN 61000-4-3 (electromagnetic field immunity) ■ EN 50121-3-2 (table 8) / EN 61000-4-4 (burst) ■ EN 50155 / EN 61000-4-5 (surge) ■ EN 50121-3-2 (table 7) / EN 61000-4-6 (conducted disturbances) ■ Conducted Emission (Power Line): 2004/104/EC; 2005/83/EC; ISO7637-2 ■ Prepared for certification according to e1 requirements of the German Federal Motor Transport Authority
BIOS	■ InsydeH2O™ UEFI Framework
Software Support	■ Windows® ■ Linux

Configuration & Options

Standard Configurations

Article No.	CPU	Memory	Graphics	I/O	Temperature
08SC27-00	E680T, 1.6 GHz	2 GB RAM	1 LVDS	1 Fast Ethernet, 2 USB 2.0, 1 GPS, 1 RS232	-40 to +85°C screened

Options

CPU	■ Intel® Atom™ E620, 0.6 GHz, 512 KB Cache, 3.3 W ■ Intel® Atom™ E620T, 0.6 GHz, 512 KB Cache, 3.3 W ■ Intel® Atom™ E640, 1.0 GHz, 512 KB Cache, 3.6 W ■ Intel® Atom™ E640T, 1.0 GHz, 512 KB Cache, 3.6 W ■ Intel® Atom™ E660, 1.3 GHz, 512 KB Cache, 3.6 W ■ Intel® Atom™ E660T, 1.3 GHz, 512 KB Cache, 3.6 W ■ Intel® Atom™ E680, 1.6 GHz, 512 KB Cache, 4.5 W ■ Intel® Atom™ E680T, 1.6 GHz, 512 KB Cache, 4.5 W
Memory	■ System RAM □ 512 MB, 1 GB or 2 GB
I/O	■ CAN bus interface via SA-Adapter™ SA8
Power Supply	■ Power over Ethernet powered device instead of PSU □ Class 0 by default, other PoE classes possible

Please note that some of these options may only be available for large volumes. Please ask our sales staff for more information.

Ordering Information

Standard SC27 Models	08SC27-00	Display electronics SBC with Intel® Atom™ E680T, 1.6 GHz, 2GB RAM, 1 Fast Ethernet on M12, 1 USB 2.0 on M12, 1 USB 2.0 Type A, 1 PCIe® MiniCard socket, 1 micro SIM card socket, 1 GPS interface, 2 SA-Adapter™ slots, EN 50155 compliant PSU, -40..+85°C operation temperature via conduction cooling (screened), conformal coating
Memory	0751-0046	MicroSD card, 2 GB, -40..+85°C
	0751-0051	SSD mSATA, 8 GB, -40..+85°C
	0751-0052	MicroSD card, 4 GB, -40..+85°C
	0754-0007	SSD SATA 256 GB, 2.5" MLC, 0..+70°C
SA-Adapters™	08SA01-00	RS232, not optically isolated, 0..+60°C
	08SA02-00	RS422/485, half duplex, optically isolated, 0..+60°C
	08SA02-01	RS422/485, full duplex, optically isolated, 0..+60°C
	08SA02-07	RS422/485, full duplex, optically isolated, -40..+85°C screened
	08SA02-09	RS422/485, half duplex, optically isolated, -40..+85°C
	08SA03-00	RS232, optically isolated, 0..+60°C
	08SA03-01	RS232, optically isolated, -40..+85°C screened
	08SA08-00	CAN ISO high-speed, optically isolated, 0..+60°C
	08SA08-01	CAN ISO high-speed, optically isolated, -40..+85°C screened
	08SA22-00	IBIS master SA-Adapter™, -40..+85°C screened
	08SA22-01	IBIS slave SA-Adapter™, -40..+85°C screened
Software: Windows®	This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.	
	10F014-78	Windows® XP Embedded BSP (MEN) for F11S, F14, F15, F17, F18, F19P, F21P, G20, XM1, XM1L, XM2, MM1, MM2, SC21, SC24, SC27, DC1, DC2, RC1 and BC50M
	10Y000-78	Windows® Embedded Standard 7 BSP for F11S, F19P, F21P, G20, XM1L, XM2, MM1, MM2, SC21, SC24, SC27, BC50M, F206, F210, F215, F216, G215, P506, P507 and P511
	13MM02-77	Windows® Installset (MEN) for MM2 and SC27 (Includes all free drivers developed by MEN for the supported hardware.)
For operating systems not mentioned here contact MEN sales .		
Documentation	20SC27-ER	SC27 Errata

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