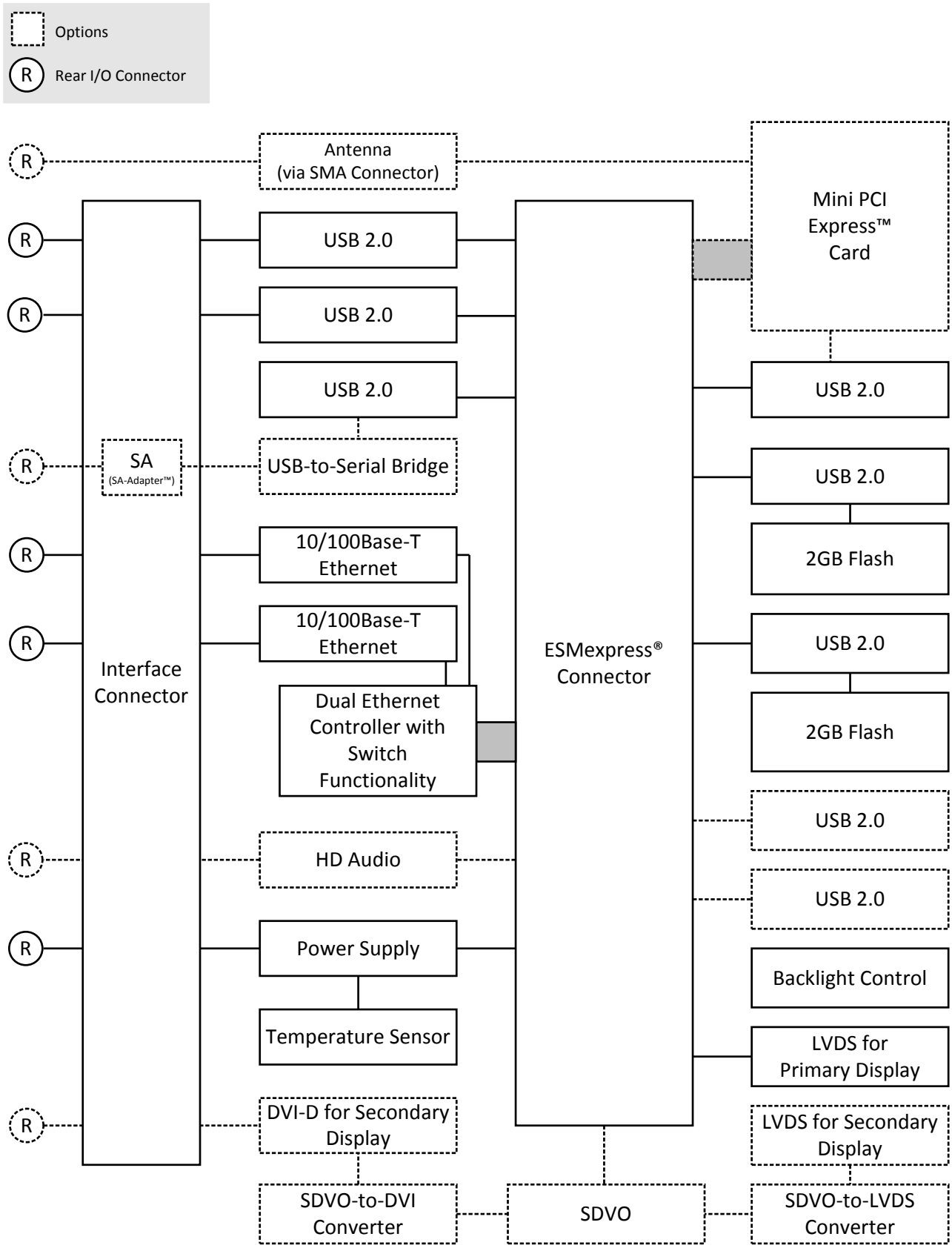
XC2 – ESMexpress® COM Carrier Board for Intelligent Displays

- **1 ESMexpress® slot**
- **4 GB USB Flash disk**
- **PCI Express® Mini Card slot**
- **LVDS on board, second LVDS or DVI-D optional**
- **2 Fast Ethernet on M12**
- **2 USB 2.0**
- **SA-Adapter™ slot for UART (COM)**
- **HD audio connector (optional)**
- **DVI-I connector (optional)**
- **Power supply 14.4 to 33.6 VDC (24 V nom.)**
- **-40 to +85°C with qualified components**

ESMexpress® is a Computer-On-Module which together with an application-specific carrier board it forms a semi-custom solution for industrial, harsh, mobile and mission-critical environments.
The XC2 is a universal ESMexpress® carrier board designed for intelligent display solutions. It offers one ESMexpress® slot that can be used together with Intel®-based ESMexpress® modules ranging from the Atom-powered XM1 and XM1L to the high-end XM2 with its Intel® Core™ 2 Duo. Thus, the XC2 provides physical interfaces and connectors for nearly all of the modern serial standard I/Os routable from the ESMexpress® connectors to the carrier board as defined in the specification. The functionality of all connectors depends on the ESMexpress® module used. The XC2 complies with the EN 50155, class Tx railway standard in order to be used for rugged infotainment applications in trains, undergrounds and public busses.

Diagram


Options
R
Rear I/O Connector
Antenna
(via SMA Connector)
Mini PCI
Express™
Card
USB 2.0
USB 2.0
USB 2.0
USB 2.0
SA
(SA-Adapter™)
USB-to-Serial Bridge
USB 2.0
2GB Flash
10/100Base-T
Ethernet
10/100Base-T
Ethernet
USB 2.0
Interface
Connector
ESMexpress®
Connector
Dual Ethernet
Controller with
Switch
Functionality
2GB Flash
USB 2.0
HD Audio
USB 2.0
Power Supply
Backlight Control
Temperature Sensor
LVDS for
Primary Display
DVI-D for Secondary
Display
LVDS for Secondary
Display
SDVO-to-DVI
Converter
SDVO
SDVO-to-LVDS
Converter

Technical Data

ESMexpress® Carrier Card	■ 1 ESMexpress® slot ■ J1 and J2 assembled
Mechanical Specifications	■ Dimensions: 233.45 x 240 x 21.8 mm □ Fit for installation in housing of 12 to 19" displays ■ Weight: >300 g
Memory	■ 1 SATA connector □ UDMA 5 supported ■ 2 USB-driven Flash disk slots □ 4 GB Flash Memory (standard, up to 32 GB possible)
Graphics	■ 1 LVDS 25-pin connector □ For direct connection of an LVDS display ■ 1 LVDS backlight 10-pin connector ■ 1 LVDS via SDVO or 1 DVI via SDVO ■ Supported DVI resolutions (depending on operating system/software): □ 640x480 (VGA) with aspect ratio 4:3 □ 800x600 (SVGA) with aspect ratio 4:3 □ 1024x768 (EXGA) with aspect ratio 4:3 □ 1152x864 (XGA) with aspect ratio 4:3 □ 1280x800 (WXGA) with aspect ratio 16:10 □ 1280x960 (SXGA) with aspect ratio 4:3 □ 1400x1050 (SXGA+) with aspect ratio 4:3 □ 1600x1200 (UXGA) with aspect ratio 4:3 up to 60 Hz □ 1920x1200 (WUXGA) with aspect ratio 16:10 up to 60 Hz
PCI Express®	■ 2 PCIe® x1
USB	■ 6 USB 2.0 (480 Mbit/s) □ Used for Flash Disk (2x), SA-Adapter™ slot and optional PCI Express® Mini Card slot □ 2 USB connectors on interface board
10/100Base-T Ethernet	■ 2 Fast Ethernet □ Switch functionality □ Full duplex mode supported
SMBus	■ 1 SMBus □ For communication between board components
I/O via interface board	■ USB 2.0 □ 2 USB Type A connectors ■ 10/100Base-T Ethernet □ 2 M12 Ethernet connectors ■ SA-Adapter™ slot □ 1 serial interface realized via SA-Adapter™, e.g., RS232 or RS422, isolated or not, GPS ■ 5 binary inputs via mixed 7W2 D-sub power connector □ 1 for key input functionality □ 4 universal inputs, e.g., for geographical addressing
Intelligent Power Supply with Controller	■ Input voltage supervision ■ Temperature supervision via LM50 sensor ■ Backlight control (turns off display at extreme temperatures) ■ Buffer functionality for RTC and BIOS CMOS ■ Reset of CPU board possible ■ Wake on Time ■ Watchdog ■ Key input functionality ■ Accessible via SMBus

Technical Data

Electrical Specifications	■ Supply voltage/power consumption: □ 24 VDC (+/- 40%) power supply according to EN 50155
MTBF	■ MTBF: 212,503 h @ 40°C according to IEC/TR 62380 (RDF 2000)
Environmental Specifications	■ Temperature range (operation): □ -40..+70°C (up to +85°C for 10 minutes - compliant with EN 50155, class Tx railway standard) □ Airflow depending on ESMexpress® module ■ Prepared for conductive cooling (via connection from mounting frame to metal display housing) ■ Temperature range (storage): -40..+85°C ■ Relative humidity (operation): max. 95% non-condensing ■ Relative humidity (storage): max. 95% non-condensing ■ Altitude: -300 m to + 2,000 m ■ Bump: 10 g/16 ms ■ Conformal coating on request
Safety	■ PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers

Configuration & Options

Standard Configurations

Article No.	For Displays	PSU	Memory	Interfaces	Specification
08XC02-00	12" to 19"	9-36VDC	4GB Flash	2 Ethernet, 2 USB, LVDS, DVI, 1 SA-Adapter slot, 1 PCI Express Mini Card slot	EN 50155 railway compliant

Options

I/O	■ Custom connector available instead of standard I/O interface board ■ Up to 6 USB 2.0 host ports (or 5 host ports and 1 client port) available at interface board connector □ If all USBs are used some functions are not available (Serial interface and Flash disk) ■ HD audio □ HD audio codec □ Audio stereo in □ Audio stereo out □ SPDIF out □ All available via D-Sub connector ■ Serial interface □ 1 serial interface realized via SA-Adapter™, e.g., RS232 or RS422, isolated or not, IBIS ■ Secondary display connection □ Connection of second LVDS display possible via SDVO-to-LVDS converter (optional) □ Alternatively, connection of second display via DVI connector on interface board (with SDVO-to-DVI-D converter)
PCI Express® Mini Card slot	■ For functions like Wi-Fi, WIMAX, GSM/GPRS, UMTS ■ PCI Express® and USB interface ■ Accessible via, e.g., a reverse SMA connector ■ SIM socket for GSM/UMTS (optional)
Electrical Specifications	■ Different input voltage ranges □ 48 VDC nom. (28.8..67.2 V), 35 W according to EN 50155 □ 72 VDC nom. (43.2..100.8 V), 35 W according to EN 50155 □ 110 VDC nom. (66..154 V), 35 W according to EN 50155 □ 24/36/110 VDC nom. (14.4..154 V), 60 W according to EN 50155

As the product concept is very flexible there are many other configuration possibilities. Please contact our sales team if you do not find your required function in the options.Please note that some of these options may only be available for large volumes.

Ordering Information

Standard XC2 Models	**08XC02-00**	Carrier board for ESMexpress® modules (Intel®), 4 GB USB Flash Disk, LVDS and DVI on board, 2 Fast Ethernet on M12, 1 SA-Adapter™ slot, 2 USB 2.0, PCI Express® Mini Card slot, 24V PSU (9..36VDC), -40..+85°C with qualified components
Related Hardware	**15PX01-00**	GLONASS & GPS PCI Express® MiniCard (full size), 3-axis Gyro sensor, -40..+85°C with qualified components
	15XM01L00	Intel® Atom™ Z530P, 1.6 GHz, 1 GB DDR2 RAM, 1 Gb Ethernet, 1x PCIe®, with cover, -50..+85°C Tcase screened
	15XM01L02	Intel® Atom™ Z510P, 1.1 GHz, 512 MB DDR2 RAM, 1 Gb Ethernet, 1x PCIe®, no J2, no cover, -50..+85°C Tcase screened
SA-Adapters™	You can find a more detailed overview of possible carrier board/SA-Adapter™ combinations along with software support in our option matrix (PDF).	
	08SA01-06	RS232, not optically isolated, -40..+85°C screened
	08SA02-07	RS422/485, full duplex, optically isolated, -40..+85°C screened
	08SA03-01	1 RS232, 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
	08SA25-00	GPS receiver, isolated, -40..+85°C screened
	08SA26-00	RS422 with 15-pin D-Sub connector, with handshake signals (RTS, CTS, DCD, DTR), coated, -40..+85°C screened

For operating systems not mentioned here contact MEN sales.

Documentation	Compare Chart ESMexpress® Embedded System Modules » Download	
	20XC02-00	XC2 User Manual

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