

# CC10S – Multi-Display Controller SBC with ARM® i.MX 6

- For LCD TFT panels from 7" to 15", Full HD
- Dual-channel LVDS or two single channels, with 2 independent screen contents
- Freescale™ ARM® i.MX 6 Series
- Multi-stream-capable HD video engine, OpenCL™ support
- Maximum resolution 1920 x 1200
- Up to 4 GB DDR3 SDRAM, eMMC multimedia card
- 1 Gb Ethernet, 2 USB 2.0, 1 UART-to-USB
- 2 UART or CAN bus interfaces
- Power supply 9 to 16 VDC (12 V nom.)
- -40°C to +85°C screened



The CC10S is a small-footprint multi-display controller board based on the Freescale™ ARM® i.MX 6 Series and provides full HD resolution for 7" to 15" panels, e. g., for driver desk displays or in-seat infotainment in trains or public buses, in medical devices, or HMIs in automotive applications.

**Scalable Performance with ARM® i.MX 6 Series**  
With its Cortex®-A9 architecture, the CC10S supports different types of the i.MX 6Solo, 6DualLite, 6Dual and 6Quad families. This makes the controller module widely scalable from low-end to high-end graphics requirements. Where less performance is needed, you can optimize costs by choosing a single- or dual-core processor instead of a quad core. In any case, the board provides dual-channel LVDS with a maximum resolution of 1920 x 1200 pixels (WUXGA).

**Powerful Graphics with a Small Footprint**  
The CC10S supports up to 4 GB onboard DDR3 SDRAM, which is abundant even for demanding imaging tasks. A soldered eMMC device provides sufficient mass storage for Linux or VxWorks® operating system images and application software, and in many cases also for image data. This makes the CC10S controller a solid base for very compact solutions. Still it can handle two independent

screen contents due to its multi-stream-capable HD video engine, which delivers up to 1080p60 decode, 1080p30 encode and 3D video playback in HD. Separate 2D and/or OpenVG Vertex acceleration engines make for optimal user interface experience.

#### Solid I/O Functions

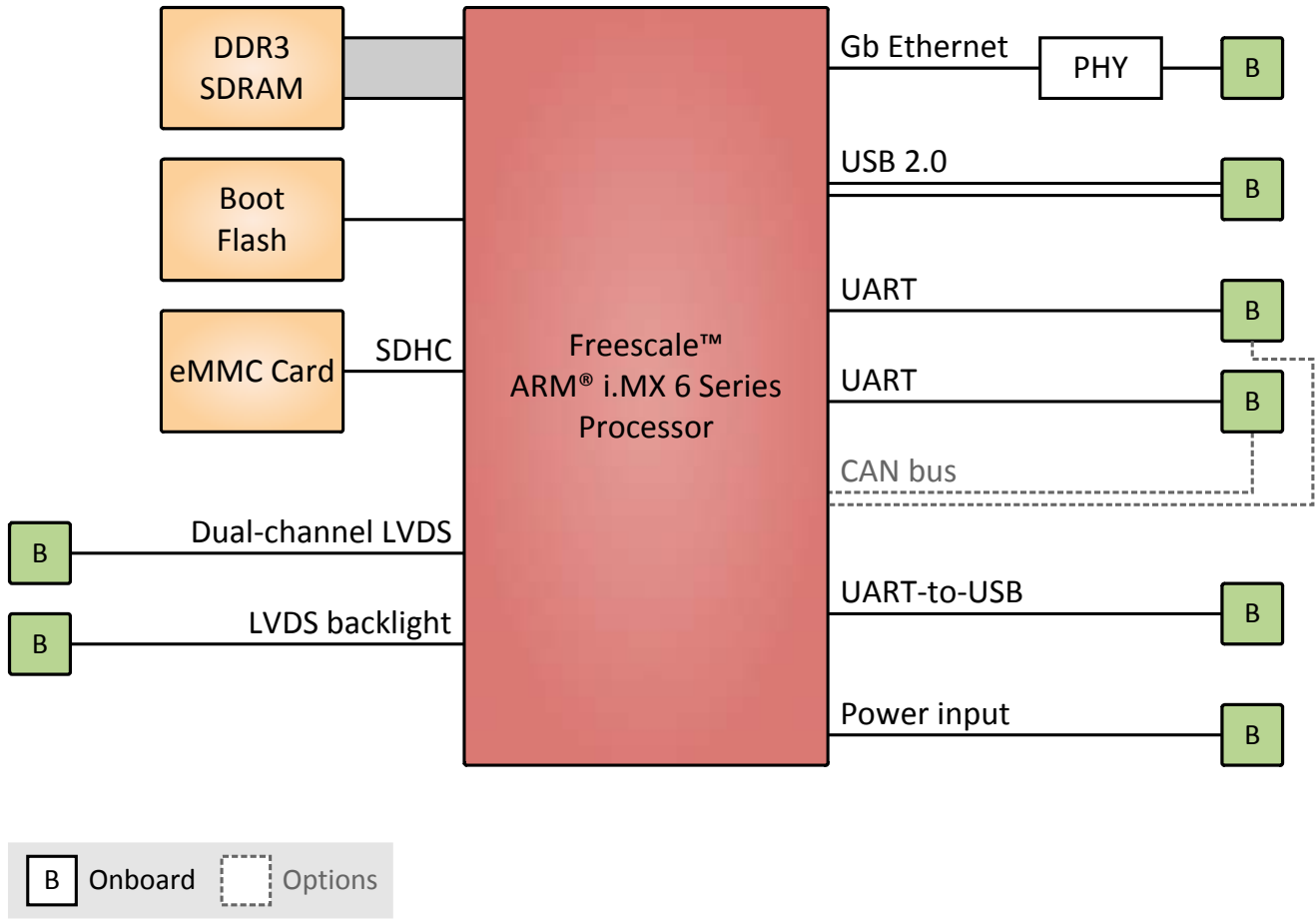
With one Gigabit Ethernet interface (1000BASE-T), two USB 2.0 ports and two UARTs for flexible RS232, RS422 or RS485 configuration and supporting up to 4 Mbit/s, the CC10S comes with a range of interfaces that covers the needs of a typical panel computer. All interfaces are accessible using onboard connectors that can be led to a housing's exterior as needed using ribbon cable.

A UART-to-USB port allows to connect a PC as a terminal, e.g., for integration or software maintenance. As an option, one or both UART connectors can be implemented as CAN bus interfaces, which is an attractive feature especially for automotive applications.

#### Rugged for Harsh Environments

Although the display controller is suited for all kinds of application areas, it is particularly suited for harsh environments. All components are available qualified for an extended temperature range of -40°C to +85°C, are soldered to withstand shock and vibration, and are prepared for conformal coating.

# Diagram



## Technical Data

<b>CPU</b>	<ul style="list-style-type: none"> <li>■ Freescale™ ARM® i.MX 6 Series (ARM® Cortex®-A9 architecture)</li> <li>■ The following CPU types are available: <ul style="list-style-type: none"> <li>□ i.MX6S (i.MX 6Solo family)</li> <li>□ i.MX6DL (i.MX 6DualLite family)</li> <li>□ i.MX6D (i.MX 6Dual family)</li> <li>□ i.MX6Q (i.MX 6Quad family)</li> </ul> </li> <li>■ <a href="#">See overview of supported processor types for processor options and a feature matrix of the i.MX 6 series</a></li> </ul>
<b>Memory</b>	<ul style="list-style-type: none"> <li>■ System Memory <ul style="list-style-type: none"> <li>□ Soldered DDR3</li> <li>□ 1 GB, 2 GB, or 4 GB</li> </ul> </li> <li>■ Boot Flash <ul style="list-style-type: none"> <li>□ 4 MB, 8 MB, or 16 MB</li> </ul> </li> </ul>
<b>Mass Storage</b>	<ul style="list-style-type: none"> <li>■ The following mass storage devices can be assembled: <ul style="list-style-type: none"> <li>□ eMMC device, soldered; different sizes available</li> </ul> </li> </ul>
<b>Graphics</b>	<ul style="list-style-type: none"> <li>■ Integrated in i.MX 6 processor</li> <li>■ Multi-stream-capable HD video engine delivering up to 1080p60 decode, 1080p30 encode and 3D video playback in HD</li> <li>■ Maximum resolution: 1920 x 1200 pixels (WUXGA)</li> <li>■ Superior 3D graphics performance with up to four shaders performing 200 Mt/s and OpenCL™ support</li> <li>■ Separate 2D and/or OpenVG Vertex acceleration engines for optimal user interface experience</li> <li>■ Stereoscopic image sensor support for 3D imaging</li> </ul>
<b>Onboard Interfaces</b>	<ul style="list-style-type: none"> <li>■ Video <ul style="list-style-type: none"> <li>□ One LVDS interface, dual-channel, ZIF connector</li> <li>□ Backlight control signals available on separate connector</li> </ul> </li> <li>■ USB <ul style="list-style-type: none"> <li>□ Two host channels, USB 2.0 (480 Mbit/s)</li> </ul> </li> <li>■ UART-to-USB <ul style="list-style-type: none"> <li>□ One channel, 4 Mbit/s</li> <li>□ Provides UART functionality using a USB connection</li> </ul> </li> <li>■ Ethernet <ul style="list-style-type: none"> <li>□ One channel, 1000BASE-T (1 Gbit/s)</li> <li>□ Link and activity LEDs</li> </ul> </li> <li>■ CAN bus <ul style="list-style-type: none"> <li>□ Up to two CAN bus channels, 2.0B CAN protocol, 1 Mbit/s, on two 10-pin connectors; optional</li> <li>□ Transceivers to be implemented separately</li> <li>□ Compatible with MEN SA-Adapters</li> </ul> </li> <li>■ UART <ul style="list-style-type: none"> <li>□ Up to two interfaces, 4 Mbit/s, on two 10-pin connectors</li> <li>□ Physical interfaces RS232 or RS422/RS485 depending on interface controller, to be implemented separately</li> <li>□ Compatible with MEN SA-Adapters</li> </ul> </li> <li>■ Power input</li> </ul>
<b>Supervision and Control</b>	<ul style="list-style-type: none"> <li>■ Power supervision and watchdog</li> <li>■ Temperature measurement <ul style="list-style-type: none"> <li>□ i.MX 6 temperature measurement</li> <li>□ Additional onboard temperature sensor; optional</li> </ul> </li> <li>■ Real-time clock, with supercapacitor or battery backup</li> </ul>
<b>Electrical Specifications</b>	<ul style="list-style-type: none"> <li>■ Supply voltage <ul style="list-style-type: none"> <li>□ +12 V (9 to 16 V)</li> </ul> </li> <li>■ Power consumption <ul style="list-style-type: none"> <li>□ 16.8 W, measured in stress test (2 LVDS displays supplied by CC10S, activity on 2 USB interfaces) using 15CC10S00, i.MX6S single-core @ 800 MHz</li> <li>□ The controller board itself dissipates about 5 W (measured in test (activity on Gb Ethernet and 1 USB interface) using 15CC10-00, i.MX6S single-core @ 800 MHz)</li> </ul> </li> </ul>

## Technical Data

<b>Mechanical Specifications</b>	<ul style="list-style-type: none"> <li>■ Dimensions: 95 mm x 95 mm</li> <li>■ Weight <ul style="list-style-type: none"> <li>□ 48 g (model 15CC10S00)</li> </ul> </li> </ul>
<b>Environmental Specifications</b>	<ul style="list-style-type: none"> <li>■ Temperature range (operation) <ul style="list-style-type: none"> <li>□ -40°C to +85°C (screened) (model 15CC10S00)</li> </ul> </li> <li>■ Temperature range (storage): -40°C to +85°C</li> <li>■ Relative humidity (operation): max. 95% non-condensing</li> <li>■ Relative humidity (storage): max. 95% non-condensing</li> <li>■ Altitude: -300 m to +3000 m</li> <li>■ Shock: 50 m/s<sup>2</sup>, 30 ms (EN 61373)</li> <li>■ Vibration (function): 1 m/s<sup>2</sup>, 5 Hz to 150 Hz (EN 61373)</li> <li>■ Vibration (lifetime): 7.9 m/s<sup>2</sup>, 5 Hz to 150 Hz (EN 61373)</li> <li>■ Conformal coating; optional</li> </ul>
<b>Reliability</b>	<ul style="list-style-type: none"> <li>■ MTBF: 844 213 h @ 40°C according to IEC/TR 62380 (RDF 2000) (model 15CC10S00)</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>■ Flammability <ul style="list-style-type: none"> <li>□ UL 94V-0</li> </ul> </li> </ul>
<b>EMC</b>	<ul style="list-style-type: none"> <li>■ EMC behavior generally depends on the system and housing surrounding the SBC.</li> </ul>
<b>Software Support</b>	<ul style="list-style-type: none"> <li>■ Linux (in preparation)</li> <li>■ VxWorks® (in preparation)</li> <li>■ <a href="#">For more information on supported operating system versions and drivers see Downloads.</a></li> </ul>
<b>BIOS</b>	<ul style="list-style-type: none"> <li>■ U-Boot Universal Boot Loader</li> </ul>

## Ordering Information

<b>Standard CC10S Models</b>	<b>15CC10S00</b>	CC10S, multi-display SBC, Freescale™ i.MX6S, 0.8 GHz, 1 GB RAM, 4 GB eMMC, -40..+85°C screened
<b>SA-Adapters</b>	<b>08SA01-00</b>	RS232, not optically isolated, 0..+60°C
	<b>08SA02-00</b>	RS422/485, half duplex, optically isolated, 0..+60°C
	<b>08SA03-00</b>	1 RS232, optically isolated, 0..+60°C
	<b>08SA08-00</b>	CAN ISO high-speed, optically isolated, 0..+60°C
<b>Miscellaneous Accessories</b>	<b>05CC10-00</b>	Heat spreader for COM Express® CC10 and display controller CC10S
	<b>05CC10S00</b>	CC10S starter kit; cables for USB, display, Ethernet, UART; 0 ..+60°C
<b>Documentation</b>	Compare Chart Standard and Custom Panel PCs » <a href="#">Download</a>	

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