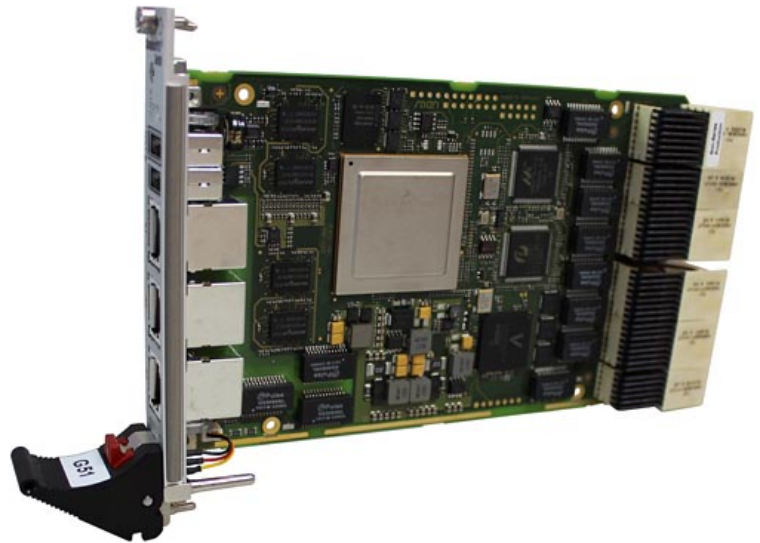


G51 – 3U CompactPCI® Serial QorIQ™ Communications CPU Board

- **Single-board computer with up to 4 Gb Ethernet**
- **P3041 Freescale™ QorIQ™ quad-core PowerPC® processor**
- **4 HP system master and peripheral slot**
- **PICMG CPCI-S.0 CompactPCI® Serial**
- **Up to 8 GB DDR3 SDRAM soldered, ECC**
- **Standard front I/O: 3 Gb Ethernet, 2 USB 2.0**
- **Standard rear I/O: 3 PCIe®, 4 Gb Ethernet, 6 USB 2.0, 2 SATA (3 Gb)**
- **-40 to +85°C with qualified components**
- **Compliant to EN 50155 (railways)**



The G51 single-board computer unites the benefits of CompactPCI® Serial and the interface capabilities and calculation power of a QorIQ™ CPU. Being based on a Freescale™ quad-core QorIQ™ P3041 processor, the 3U, 4 HP SBC provides a large number of high-speed serial interfaces both at the front and at the CPCI-S.0 rear connectors.

Three Gigabit Ethernet channels at the front and another standard port at the rear provide solid connectivity. The three front ports can also be routed to the rear, so that a maximum of four Ethernet channels are available on the backplane. This routing option is a standard feature, and can be set in the U-Boot boot loader.

In a similar way, the G51 single-board computer comes with two SATA 2.x channels, where one can either be used for an onboard mSATA 2.x disk, or as a second port at the rear - also switchable via U-Boot. SGPIO is available, too.

The G51 comes with six standard rear USB 2.0 ports, and the standard front USB interface can be led to the rear as a hardware option, for a total of seven

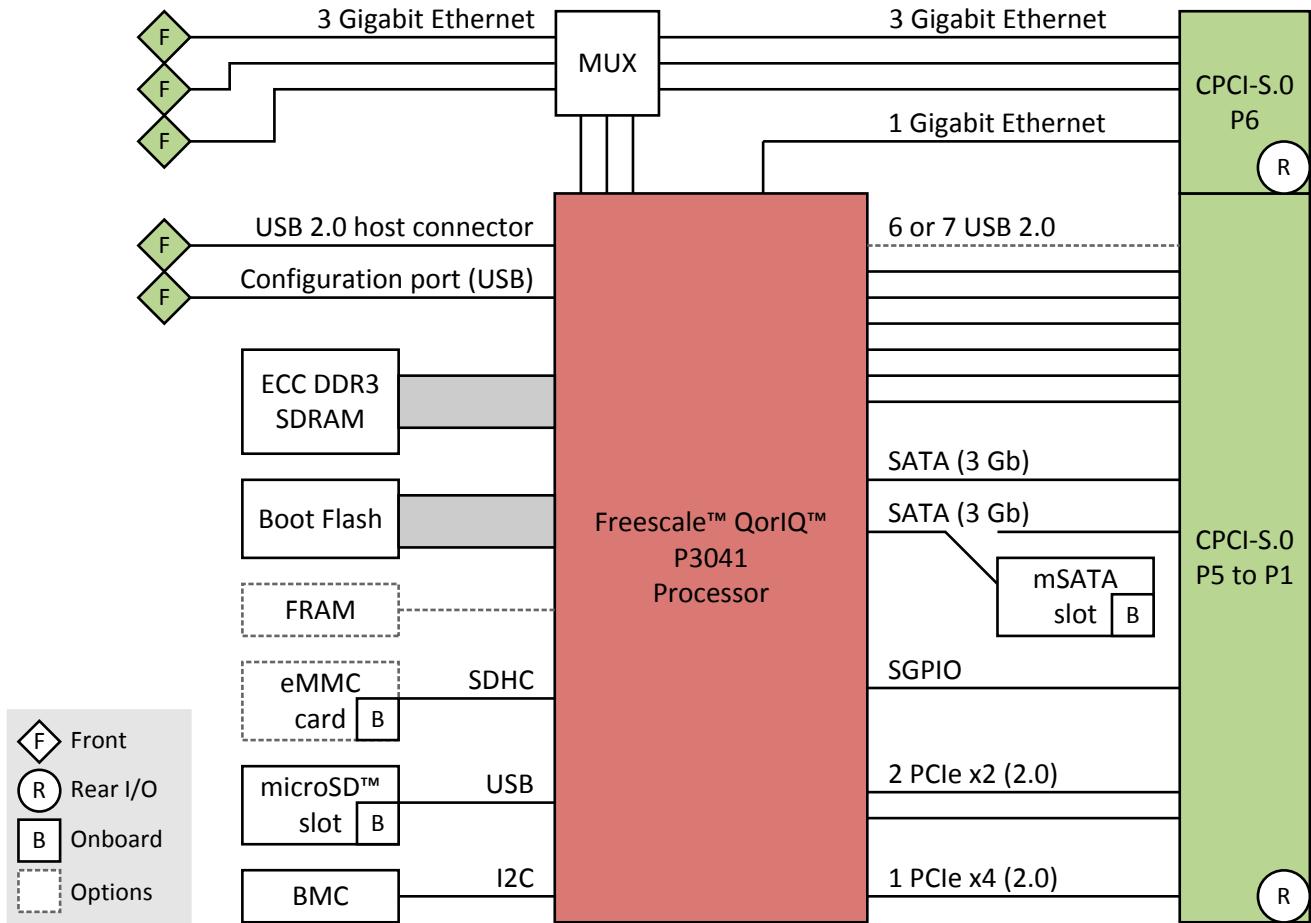
backplane channels. Three PCI Express® links (two x2 and one x4) add another important column of CompactPCI® Serial features to the G51's rear I/O.

Its abundant connectivity, flexible configuration options and multi-core computing performance make the G51 a universal off-the-shelf platform for all kinds of communication and processing tasks. Data acquisition, data encryption, simulation and process control systems are only a few examples. Suitable CompactPCI® Serial peripheral cards are available to add specialized functions in a modular system where necessary.

Apart from its connectivity, the card comes with fast DDR3 RAM, a microSD™ card slot, a number of board management functions and Linux BSP support. All components are soldered for protection against shock and vibration and withstand an extended operating temperature of -40°C to +85°C. As an option, the board can be equipped with M12 Ethernet front connectors. The G51 is also ready for coating so that it can be used in humid and dusty environments.

All this makes the G51 a perfect choice for railway, avionics or marine applications, but also for fields like automation or power & energy, where computers face harsh environments.

Diagram



Technical Data

CPU	<ul style="list-style-type: none"> ■ The following CPU types are available: <ul style="list-style-type: none"> □ Freescale™ QorIQ™ P3041, quad core, 1.2 GHz, 600 MHz memory bus, with encryption □ Freescale™ QorIQ™ P3041, quad core, 1.2 GHz, 600 MHz memory bus, without encryption □ Freescale™ QorIQ™ P3041, quad core, 1.33 GHz, 667 MHz memory bus, with encryption □ Freescale™ QorIQ™ P3041, quad core, 1.33 GHz, 667 MHz memory bus, without encryption
Memory	<ul style="list-style-type: none"> ■ System Memory <ul style="list-style-type: none"> □ Soldered DDR3 □ With or without ECC support □ 2 GB, 4 GB, or 8 GB ■ Boot Flash <ul style="list-style-type: none"> □ 64 MB, 128 MB or 256 MB ■ FRAM, non-volatile <ul style="list-style-type: none"> □ 0 KB or 8 KB ■ Please see Ordering Information for available standard versions.
Mass Storage	<ul style="list-style-type: none"> ■ The following mass storage devices can be assembled: <ul style="list-style-type: none"> □ microSD™ card □ mSATA disk □ eMMC device, soldered; different sizes available
Front Interfaces	<ul style="list-style-type: none"> ■ USB <ul style="list-style-type: none"> □ One Series A connectors, USB 2.0 (480 Mbit/s), host interface, switchable to the rear connector □ One configuration port implemented as a USB 2.0 (480 Mbit/s) device interface ■ Ethernet <ul style="list-style-type: none"> □ Three RJ45 connectors, 1000BASE-T (1 Gbit/s), or □ Three M12 connectors, 1000BASE-T (1 Gbit/s) □ All front ports can be switched to the rear using U-Boot for a total of four rear channels □ Two link and activity LEDs per channel □ IEEE 1588 support (PTP, Precision Time Protocol) for 3 front/rear ports and 1 additional rear port ■ Front-panel LED for board status ■ Blue front LED for hot plug ■ Reset button
Onboard Interfaces	<ul style="list-style-type: none"> ■ Two onboard user LEDs
Rear Interfaces	<ul style="list-style-type: none"> ■ Compatible with CompactPCI® Serial PICMG CPCI-S.0 Specification ■ SATA <ul style="list-style-type: none"> □ Two channels, SATA Revision 2.x (3 Gbit/s) (reduces to one port if the link to the mSATA disk is required, can be switched in U-Boot) ■ Serial GPIO (SGPIO) <ul style="list-style-type: none"> □ One channel, compliant with SFF 8485 specification ■ USB <ul style="list-style-type: none"> □ Six channels, USB 2.0 (480 Mbit/s), host □ Option: One additional host port via CPCI-S.0 rear connector instead of front connection ■ Ethernet <ul style="list-style-type: none"> □ One channel, 1000BASE-T (1 Gbit/s) □ All front ports can be switched to the rear using U-Boot for a total of four rear channels ■ PCI Express® <ul style="list-style-type: none"> □ Two x2 links (1000 MB/s per link), PCIe® 2.x (5 Gbit/s per lane) □ One x4 link (2 GB/s per link), PCIe® 2.x (5 Gbit/s per lane)
Supervision and Control	<ul style="list-style-type: none"> ■ Board controller ■ Watchdog timer ■ Temperature measurement ■ Real-time clock with supercapacitor or onboard battery backup <ul style="list-style-type: none"> □ Data retention of supercapacitor: 72 hours ■ Hot-plug capability <ul style="list-style-type: none"> □ Hot-pluggable when used as a peripheral board

Technical Data

Backplane Standard	<ul style="list-style-type: none"> ■ CompactPCI® Serial PICMG CPCI-S.0 Specification ■ System or peripheral slot
Electrical Specifications	<ul style="list-style-type: none"> ■ Supply voltage: +12 V (-5%/+5%)
Mechanical Specifications	<ul style="list-style-type: none"> ■ Dimensions: 3U, 4 HP
Environmental Specifications	<ul style="list-style-type: none"> ■ Temperature range (operation): <ul style="list-style-type: none"> □ -40..+85°C (qualified components) □ Airflow: min. 1.5 m/s ■ Temperature range (storage): -40..+85°C ■ Cooling concept <ul style="list-style-type: none"> □ Air-cooled, or □ Conduction-cooled in MEN CCA frame ■ 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): 5.72 m/s², 5 Hz - 150 Hz (EN 61373) ■ Conformal coating on request
Reliability	<ul style="list-style-type: none"> ■ MTBF <ul style="list-style-type: none"> □ 13 981 h @ 40°C according to IEC/TR 62380 (RDF 2000) (model 02G051-00 with supercapacitor) □ 480 063 h @ 40°C according to IEC/TR 62380 (RDF 2000) (calculated for model 02G051-00 without supercapacitor)
Safety	<ul style="list-style-type: none"> ■ Flammability <ul style="list-style-type: none"> □ UL 94V-0 ■ Electrical Safety <ul style="list-style-type: none"> □ Insulation measurement test according to EN 50155 (12.2.9.1) □ Voltage withstand test according to EN 50155 (12.2.9.2) □ Information technology equipment test according to EN 60950
EMC Conformity	<ul style="list-style-type: none"> ■ EN 55022, IEC 61000-6-4 (radio disturbance) ■ IEC 61000-4-2 (ESD) ■ IEC 61000-4-3 (electromagnetic field immunity) ■ IEC 61000-4-4 (burst) ■ IEC 61000-4-5 (surge) ■ IEC 61000-4-6 (conducted disturbances)
Software Support	<ul style="list-style-type: none"> ■ Linux (in preparation) ■ For more information on supported operating system versions and drivers see Software.
BIOS	<ul style="list-style-type: none"> ■ U-Boot Universal Boot Loader

Configuration & Options

Standard Configurations

Article No.	CPU Type / Clock	Encryption	System RAM	FRAM	eMMC	USB	Ethernet Conn.	Operating Temperature
02G051-00	P3041, 1.2 GHz	No	2 GB	0 KB	0 GB	2 front, 6 rear	RJ45	-40..+85°C

Ordering Information

Standard G51 Models	02G051-00	3U CompactPCI® Serial communications SBC, Freescale™ QorIQ™ P3041, 1.2 GHz, 2 GB RAM with ECC, RJ45 Ethernet at front, -40..+85°C
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
Systems & Card Cages	0701-0058	CompactPCI® Serial 19" 4U/84 HP rack-mount enclosure for 3U cards (vertical), 9-slot backplane, system slot left, full mesh, 460 W ATX PSU 90..264VAC, 1U fan tray with 2x 12 VDC fans, 0..+45°C
<p>MEN delivers turn-key systems completely installed (hardware, operating system, accessories), wired and tested. Different rack sizes, power supplies and backplanes on request. For details please contact your local sales representative.</p>		

Contact Information

Germany

MEN Mikro Elektronik GmbH
Neuwieder Straße 3-7
90411 Nuremberg
Phone +49-911-99 33 5-0
Fax +49-911-99 33 5-901

info@men.de
www.men.de

France

MEN Mikro Elektronik SAS
18, rue René Cassin
ZA de la Châtelaine
74240 Gaillard
Phone +33 (0) 450-955-312
Fax +33 (0) 450-955-211

info@men-france.fr
www.men-france.fr

USA

MEN Micro Inc.
860 Penllyn Blue Bell Pike
Blue Bell, PA 19422
Phone (215) 542-9575
Fax (215) 542-9577

sales@menmicro.com
www.menmicro.com

The date of issue stated in this data sheet refers to the Technical Data only. Changes in ordering information given herein do not affect the date of issue. All brand or product names are trademarks or registered trademarks of their respective holders.

MEN is not responsible for the results of any actions taken on the basis of information in the publication, nor for any error in or omission from the publication.

MEN expressly disclaims all and any liability and responsibility to any person, whether a reader of the publication or not, in respect of anything, and of the consequences of anything, done or omitted to be done by any such person in reliance, whether wholly or partially, on the whole or any part of the contents of the publication.

The correct function of MEN products in mission-critical and life-critical applications is limited to the environmental specification given for each product in the technical user manual. The correct function of MEN products under extended environmental conditions is limited to the individual requirement specification and subsequent validation documents for each product for the applicable use case and has to be agreed upon in writing by MEN and the customer. Should the customer purchase or use MEN products for any unintended or unauthorized application, the customer shall indemnify and hold MEN and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim or personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that MEN was negligent regarding the design or manufacture of the part.

In no case is MEN liable for the correct function of the technical installation where MEN products are a part of.

Copyright © 2015 MEN Mikro Elektronik GmbH. All rights reserved.