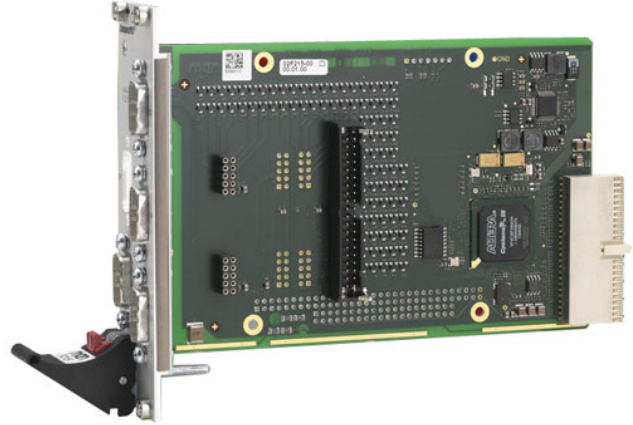


F215 – 3U CompactPCI® Universal Interface Board

- **5 interfaces at 8 HP front: 2 UARTs, 2 CAN bus, 1 binary I/O port**
- **Other function combinations via FPGA IP cores**
- **For protocols/physical layers like RS232/RS422/RS485, HDLC, InterBus-S, CAN bus, binary I/O**
- **Physical layers via SA-Adapters™**
- **-40 to +85°C with qualified components**



The F215 is a universal interface board based on 3U CompactPCI®. The physical layer can be realized individually for each channel by means of SA-Adapters™.

SA-Adapters™ are small universal boards providing the line drivers for legacy serial I/O, fieldbus interfaces and other small I/O functions. Most SA-Adapters™ use 9-pin D-Sub connectors which are accessible at the front panel. Alternatively, the adapter can be connected to the front panel via ribbon cable. The SA concept allows to add additional I/O interfaces to the F215, enhancing flexibility with regard to the line transceivers and isolation requirements.

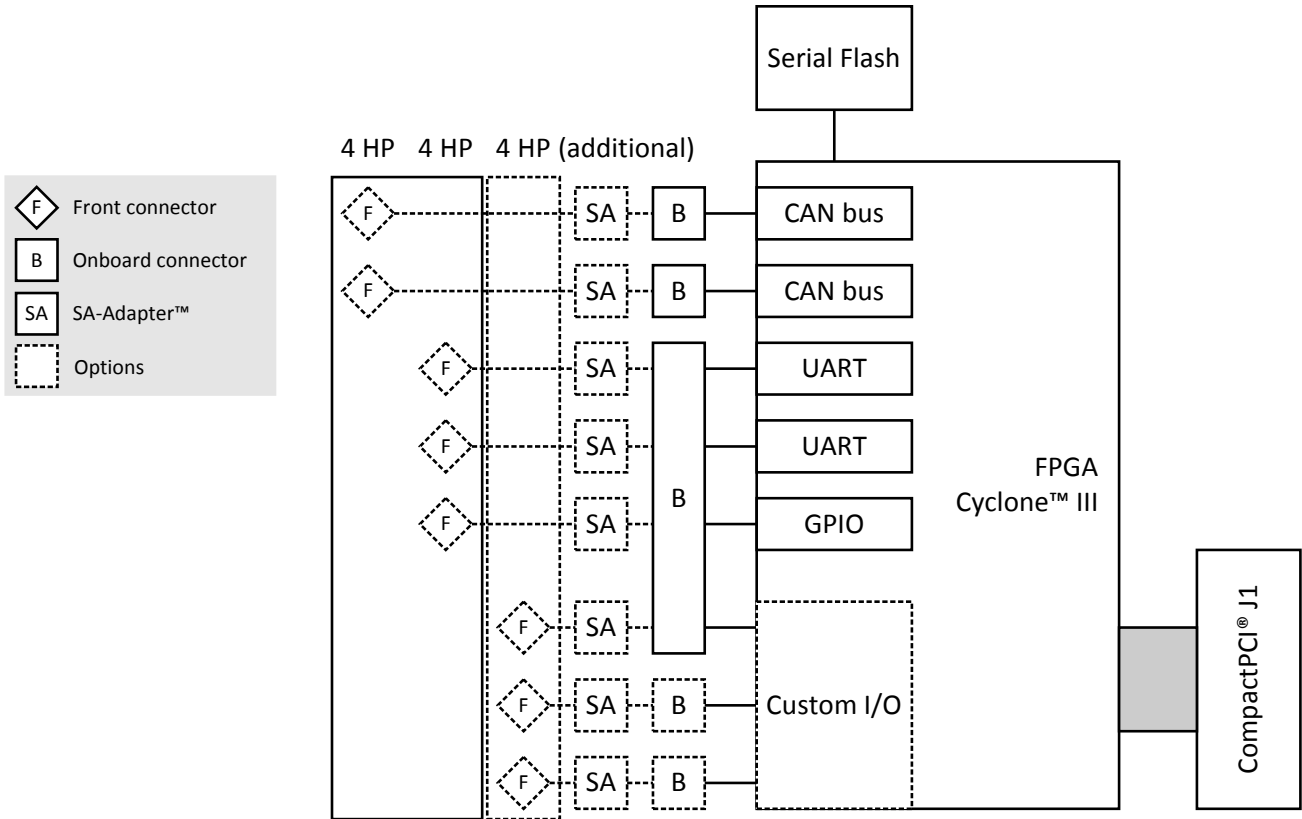
Two SA-Adapters™ can be mounted directly on the F215, the other maximum six adapters need more front-panel space and are connected to the carrier via

ribbon cable. The F215 comes in a standard configuration with five pre-defined functions on 8 HP: two CAN interfaces, two UARTs and one 8-channel binary I/O interface. SA-Adapters™ are not included in the delivery, because different types are available, e.g. for the UARTs. They can be ordered as needed.

The board's I/O functions are realized by means of an FPGA, making it a very flexible, inexpensive solution for dedicated serial I/O. The card can become "everything" from a customized I/O combination to a specialized 8-port CAN card or even an intelligent I/O board including a Nios® soft core, on 4, 8 or 12 HP. The FPGA is loaded automatically after power-up from a 4 MB serial Flash. It is also possible to access this Flash from the CompactPCI® bus to update its contents.

The F215 is designed for use in rugged environments. For example, all components are soldered-on and are specified for an operating temperature of -40 to +85°C.

Diagram



Technical Data

<p>I/O Interfaces</p>	<ul style="list-style-type: none"> ■ Different variations possible through FPGA IP cores and SA-Adapters™: <ul style="list-style-type: none"> □ RS232 □ RS422 □ RS485 □ IBIS master/slave □ CAN bus □ HDLC □ Binary I/O □ The FPGA offers the possibility to add customized I/O functionality. See FPGA. □ Option matrix showing possible IP cores and SA-Adapters™ (PDF) ■ Accessible via onboard connectors <ul style="list-style-type: none"> □ Physical interface at front panel using SA-Adapters™ □ Two interfaces for direct onboard connection of SA-Adapters™ □ Up to six interfaces for connection of SA-Adapters™ via 10-pin ribbon cable ■ Standard factory interface configuration: <ul style="list-style-type: none"> □ 8 HP front panel with five SA-Adapter™ cut-outs for □ 2 CAN bus interfaces □ 2 UART interfaces □ 1 binary I/O interface □ No SA-Adapters™ included by standard; they can be selected as needed ■ Standard factory FPGA configuration: <ul style="list-style-type: none"> □ 16Z029_CAN - CAN controller (controls CAN X1) □ 16Z029_CAN - CAN controller (controls CAN X2) □ 16Z125_UART - UART controller (controls UARTs X3/X4) □ 16Z037_GPIO - GPIO controller (8 I/O lines on X5)
<p>Memory</p>	<ul style="list-style-type: none"> ■ 4 MB serial Flash for FPGA configuration
<p>Miscellaneous</p>	<ul style="list-style-type: none"> ■ Four status LEDs at front panel <ul style="list-style-type: none"> □ One status LED to signal FPGA configuration (interfaces ready) □ Three user LEDs, FPGA-controlled by 16Z034_GPIO controller
<p>Local PCI Bus</p>	<ul style="list-style-type: none"> ■ 32-bit/33-MHz, 3.3 V V(I/O) ■ Compliant with PCI Specification 2.2
<p>CompactPCI® Bus</p>	<ul style="list-style-type: none"> ■ Compliance with CompactPCI® Core Specification PICMG 2.0 R3.0 ■ Peripheral slot ■ V(I/O): +3.3 V
<p>Electrical Specifications</p>	<ul style="list-style-type: none"> ■ Supply voltage/power consumption: <ul style="list-style-type: none"> □ +5 V (-3%/+5%), current depends on mounted SA-Adapters™; 200 mA without SA-Adapters™ □ +3.3 V (-3%/+5%), 150 mA typ.
<p>Mechanical Specifications</p>	<ul style="list-style-type: none"> ■ Dimensions: conforming to CompactPCI® specification for 3U boards ■ Front panel: 8 HP with ejector <ul style="list-style-type: none"> □ For up to five interfaces ■ Weight: 175 g (w/o SA-Adapters™)

Technical Data

Environmental Specifications

- Temperature range (operation):
 - -40..+85°C (qualified components)
 - Airflow: min. 1.0 m/s
- 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:
 - 15 g, 11 ms (EN 60068-2-27)
 - 50 m/s², 30 ms (EN 61373)
- Bump: 10 g, 16 ms (EN 60068-2-29)
- Vibration (sinusoidal): 1 g, 10 Hz - 150 Hz (EN 60068-2-6)
- 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

- 383 944 h @ 40°C according to IEC/TR 62380 (RDF 2000)

Safety

- PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers

EMC

- Tested according to EN 55022 (radio disturbance), IEC 61000-4-2 (ESD) and IEC 61000-4-4 (burst)

Software Support

- Driver software for Windows®, Linux, VxWorks®, QNX®
- Flash update tools for Windows®, Linux, VxWorks®
- [For more information on supported operating system versions and drivers see Downloads.](#)

FPGA

This product offers the possibility to add customized I/O functionality in FPGA.

Flexible Configuration

- Customized I/O functions can be added to the FPGA.
- It depends on the board type, pin counts and number of logic elements which IP cores make sense and/or can be implemented. Please contact MEN for information on feasibility.
- [You can find more information on our web page "User I/O in FPGA"](#)

FPGA Capabilities

- FPGA Altera® Cyclone® III EP3C40
 - 39 600 logic elements
 - 1134 Kbits total RAM
- For interface functions
- 4 MB external Flash for FPGA configurations
- Connection
 - Total available pin count: 64 pins
 - Functions available via onboard I/O connectors
 - SA-Adapters™ are used to realize the physical lines.
- Functional updates via software
 - MEN offers Flash update tools for different operating systems.

Configuration & Options

Standard Configurations

Article No.	Front Panel	FPGA Cores	Operating Temperature
02F215-00	8 HP, 5 D-Sub slots	2 CAN, 2 UARTs, 1 binary I/O (8-bit)	-40..+85°C

Options

Physical Layers	<ul style="list-style-type: none"> ■ Via up to eight SA-Adapters™ ■ Different variations possible through FPGA IP cores and SA-Adapters™: <ul style="list-style-type: none"> □ RS232 □ RS422 □ RS485 □ IBIS master/slave □ CAN bus □ HDLC □ Binary I/O □ InterBus-S □ GPS □ Other physical layers dependent on FPGA configuration □ Option matrix showing possible IP cores and SA-Adapters™ (PDF)
Mechanical	<ul style="list-style-type: none"> ■ 4, 8 or 12 HP front panel dependent on number of SA-Adapters™ <ul style="list-style-type: none"> □ 4 HP with 2 onboard SA-Adapters™ □ 8 HP with 5 SA-Adapters™ (standard) □ 12 HP with 8 SA-Adapters™ ■ One-piece front panel
Cooling Concept	<ul style="list-style-type: none"> ■ Also available with conduction cooling in MEN CCA frame

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 F215 Models	02F215-00	8 HP FPGA-based universal interface prepared for direct connection of 2x CAN (first slot), 2x UART and 1x 8-bit GPIO (second slot) at front as standard FPGA content plus space for user-defined functions, -40..+85°C with qualified components (SA-Adapters™ to be ordered separately)
SA-Adapters™		<p>You can find a more detailed overview of possible carrier board/SA-Adapter™ combinations along with software support in our option matrix (PDF).</p> <p>08SA01-00 RS232, not optically isolated, 0..+60°C</p> <p>08SA02-00 RS422/485, half duplex, optically isolated, 0..+60°C</p> <p>08SA02-07 RS422/485, full duplex, optically isolated, -40..+85°C screened</p> <p>08SA03-01 1 RS232, optically isolated, -40..+85°C screened</p> <p>08SA08-00 CAN ISO high-speed, optically isolated, 0..+60°C</p> <p>08SA08-01 CAN ISO high-speed, optically isolated, -40..+85°C screened</p> <p>08SA15-00 8 digital I/O channels, -40..+85°C with qualified components, no RoHS</p> <p>08SA22-00 IBIS master SA-Adapter™, -40..+85°C screened</p> <p>08SA22-01 IBIS slave SA-Adapter™, -40..+85°C screened</p> <p>08SA25-00 GPS receiver, isolated, -40..+85°C screened</p>
Software: Linux		<p>This product is designed to work under Linux. See below for potentially available separate software packages from MEN.</p> <p>13Z015-06 MDIS5™ low-level driver sources (MEN) for 16Z029_CAN (MSCAN/Layer2)</p> <p>13Z016-06 MDIS5™ driver (MEN) for 16Z029_CAN (CANopen master)</p> <p>13Z017-06 MDIS5™ low-level driver sources (MEN) for 16Z034_GPIO, 16Z037_GPIO and 16Z127_GPIO</p> <p>13Z025-90 Linux native driver (MEN) for 16Z025_UART, 16Z057_UART and 16Z125_UART</p> <p>13Z055-90 Linux native driver (MEN) for 16Z055_HDLC with TCP/PPP support</p> <p>13Z100-91 Linux FPGA update tool (MEN)</p>
Software: Windows®		<p>This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.</p> <p>10Y000-78 Windows® Embedded Standard 7 BSP for F11S, F19P, F21P, F22P, F75P, G20, G22, XM1L, XM2, MM1, MM2, SC21, SC24, SC27, BC50M, BC50I, BL50W, BL50S, DC13, F206, F210, F215, F216, G215, P506, P507 and P511</p> <p>13F215-77 Windows® Installset (MEN) for F215 and G215 (Includes all free drivers developed by MEN for the supported hardware.)</p> <p>13Z016-70 MDIS5™ Windows® driver (MEN) for 16Z029_CAN (CANopen master)</p> <p>13Z100-70 Windows® FPGA update tool (MEN)</p>

Ordering Information

Software: VxWorks®	<p>This product is designed to work under VxWorks®. For details regarding supported/unsupported board functions please refer to the corresponding software data sheets.</p> <table border="1"> <tr> <td>13Z015-06</td> <td>MDIS5™ low-level driver sources (MEN) for 16Z029_CAN (MSCAN/Layer2)</td> </tr> <tr> <td>13Z016-06</td> <td>MDIS5™ driver (MEN) for 16Z029_CAN (CANopen master)</td> </tr> <tr> <td>13Z017-06</td> <td>MDIS5™ low-level driver sources (MEN) for 16Z034_GPIO, 16Z037_GPIO and 16Z127_GPIO</td> </tr> <tr> <td>13Z025-60</td> <td>VxWorks® native driver (MEN) for 16Z025_UART, 16Z057_UART and 16Z125_UART</td> </tr> <tr> <td>13Z100-60</td> <td>VxWorks® FPGA update tool (MEN)</td> </tr> </table>	13Z015-06	MDIS5™ low-level driver sources (MEN) for 16Z029_CAN (MSCAN/Layer2)	13Z016-06	MDIS5™ driver (MEN) for 16Z029_CAN (CANopen master)	13Z017-06	MDIS5™ low-level driver sources (MEN) for 16Z034_GPIO, 16Z037_GPIO and 16Z127_GPIO	13Z025-60	VxWorks® native driver (MEN) for 16Z025_UART, 16Z057_UART and 16Z125_UART	13Z100-60	VxWorks® FPGA update tool (MEN)
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For operating systems not mentioned here [contact MEN sales](#).

Documentation	<p>Compare Chart 3U CompactPCI® / PlusIO CPU cards » Download</p> <p>Compare Chart 3U CompactPCI® / PlusIO peripheral cards » Download</p> <table border="1"> <tr> <td>20F215-00</td> <td>F215 User Manual</td> </tr> <tr> <td>20SA01-00</td> <td>SA1 User Manual</td> </tr> <tr> <td>20SA02-00</td> <td>SA2 User Manual</td> </tr> <tr> <td>20SA03-00</td> <td>SA3 User Manual</td> </tr> <tr> <td>20SA08-00</td> <td>SA8 User Manual</td> </tr> <tr> <td>20SA15-00</td> <td>SA15 User Manual</td> </tr> <tr> <td>20SA22-00</td> <td>SA22 User Manual</td> </tr> <tr> <td>20SA25-00</td> <td>SA25 User Manual</td> </tr> </table>	20F215-00	F215 User Manual	20SA01-00	SA1 User Manual	20SA02-00	SA2 User Manual	20SA03-00	SA3 User Manual	20SA08-00	SA8 User Manual	20SA15-00	SA15 User Manual	20SA22-00	SA22 User Manual	20SA25-00	SA25 User Manual
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