



Product Information

CU1-CHORUS • *CompactPCI*[®] Intelligent 16-Port Asynchronous Interface

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Despite emerging communication standards like FireWire, Fibre Channel or Gigabit-Ethernet: the most common data interface in use is the RS-232 (asynchronous serial interface).

Most industrial computer systems however (in this manner comparable to their office desktop companions) are limited to 2 serial ports, sometimes charged already by peripherals like mouse and modem. In addition, the typical COM ports are generating considerable interrupt load when operated with higher Baudrates, hence reducing noticeable the host CPU performance.

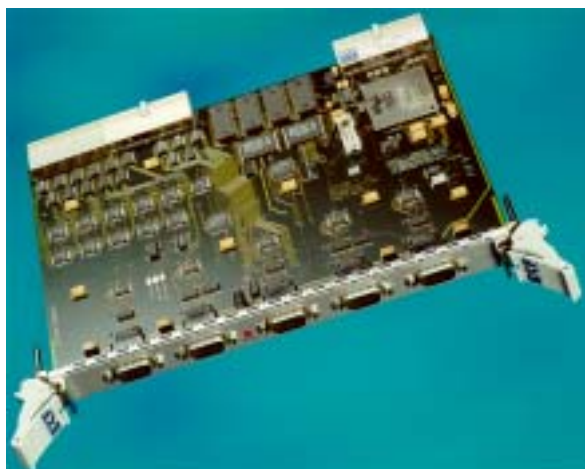
The solution to these problems is a multi-port UART interface board with local intelligence for preprocessing and buffering the serial data streams.

The intelligent *CompactPCI*[®] hostadapter **CU1-CHORUS** provides a total of 16 serial ports (16550 type UARTs), each capable of bitrates up to 230.4kbps.

Equipped with the powerful embedded processor i960RP(D), the board profits from the built-in PCI bridge as interface to the *CompactPCI*[®] system bus. 8MB DRAM and 4MB Flash EEPROM offer generous local data buffering and program space.

The serial ports are configured as RS-232, or any other standard (e.g. RS-485) by means of an additionally available rear I/O transition board and PHY interface modules.

Hence the CU1-CHORUS is ideally suited for all hard real-time applications with demand for serial interfaces, e.g. data acquisition, data concentration and machine control.



CU1-CHORUS

Five of the serial ports are ready to use RS-232 configured, reachable by the corresponding 9-pin D-Sub connectors protruding through the front panel of the CU1-CHORUS. In addition, all 16 UART channels are wired as TTL-level signals to the rear connectors J4/J5. By employing external transition modules with built-in transceivers, not only the RS-232, but also any other popular industrial standard as RS-422/485 can be realized, including isolated interfaces.

The CU1-CHORUS hardware supports the I₂O interface. This is a layered, standardized driver concept, modelled after the OSI reference, suitable especially for intelligent I/O sub-processors.

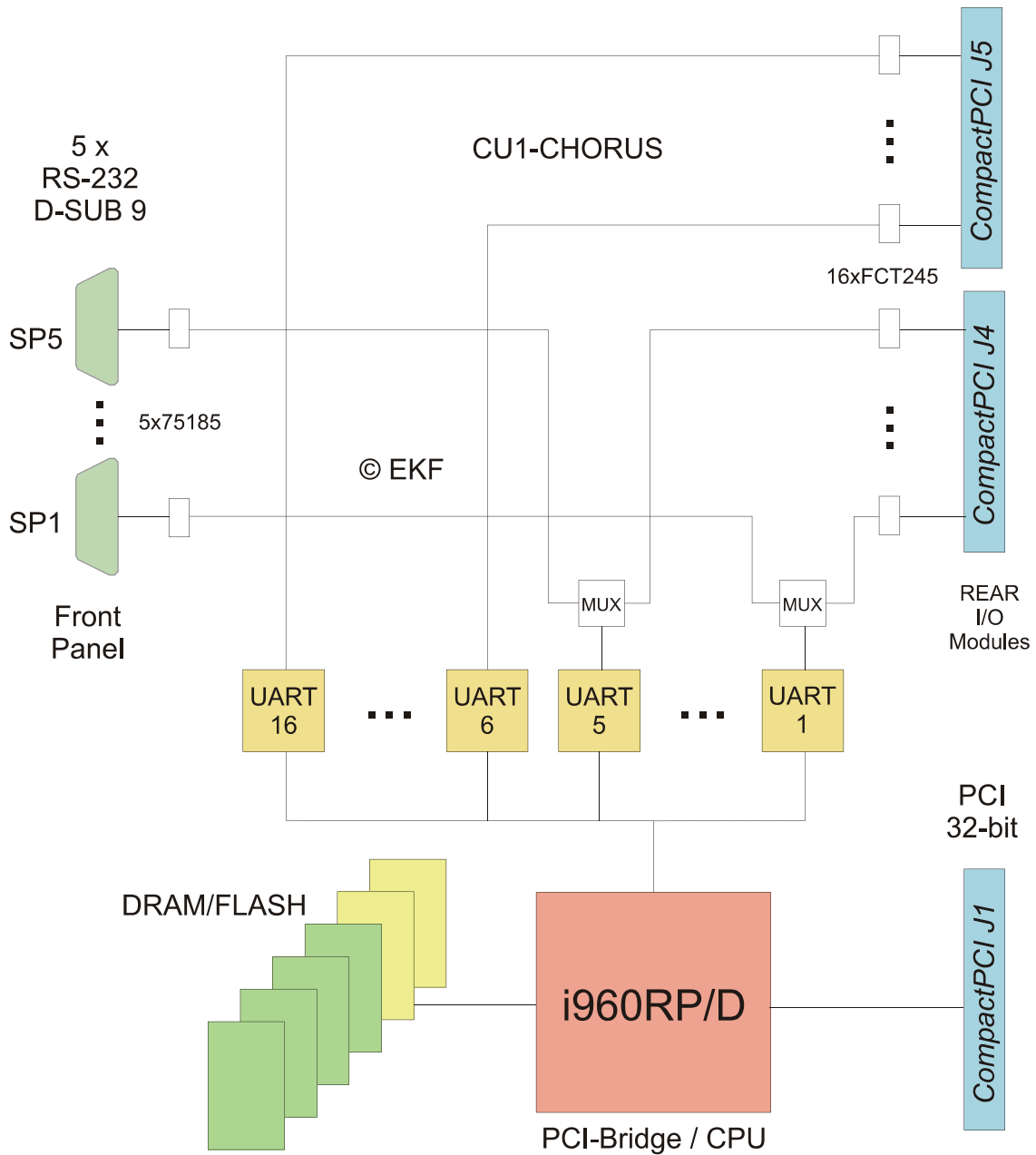
The EKF drivers treat the CU1-CHORUS module as 16C550 compatible COM ports. The drivers allow arbitrary names e.g. COM3..COM18 to be associated with the ports of a CHORUS.

Developers might prefer to collect serial data for block transfers or local preprocessing directly on the CHORUS board. Program and data can be stored in a generous amount of local memory (8MB DRAM and 4MB Flash EEPROM). As a development tool, EKF provides the resident monitor/debugger MON960, which allows stand-alone operation and download of programs via CPCI bus or serial interface. Furthermore EKF can offer turn key ready application programming support.

Use of the CU1-CHORUS frees the host-CPU from critical low level tasks, an essential criterion for real-time applications. Because the CHORUS can be supplemented by a variety of external transition (transceiver) modules for popular serial interface standards, it is a smart and flexible solution to many different industrial applications, offering a fast time to market at moderate cost.



CU1-CHORUS with Rear-I/O Module






Block Diagram CU1-CHORUS



CU1-CHORUS • Component Assembly Drawing

Technical Specifications		
Printed Circuit Board	Dimensions	6U Eurocard (233x160mm ²), front panel width 20.3mm (4HP), mechanics constructed with respect to EMC requirements, ejector lever
CPU	Microprocessor	Intel i960RP/RD, 3.3V, 33/66MHz, clocked by system bus (local oscillator provided when operated as stand-alone)
	Memory	8MByte FPM/EDO DRAM, 32-bit, 4MByte FLASH ROM (SMT) 28F160S5 (Intel, Sharp), 32-bit
	Utilities	Watchdog and 5V/3.3V voltage-supervisor MAX705, serial EEPROM 4KByte I ² C, optional: ACCESS.bus interface
	Firmware	Mon960 Monitor/Debugger available
Serial Interfaces	Interface Type	asynchronous, serial protocol: 1 startbit; 7 or 8 databits; 1 or 2 stopbits; optional even/odd parity; standard bitrates up to 230.4 kbps
	Serial Interface Controller	16 x 16C550 asynchronous communication element, Texas Instruments TL16C550C or equivalent
	Physical Interface	UARTs 1-5 only: RS-232/V.24 by 75185 transceivers, all UARTs: TTL level signal additionally
	Connectors SP1-SP5	front panel mounted 9-pin D-Sub male connectors (RS-232E, PC compatible)
	Connectors J4/J5	TTL-level signals routed to the J4 and J5 connectors for arbitrary use with rear I/O transition board and PHY interface modules providing the external transceiver circuitry
	Drivers	serial drivers (COM port emulation) available for Windows NT4.0 and Windows 2000, others forthcoming
CompactPCI[®] Bus	Connector J1	32-Bit, 33MHz (133MBps) 32-Bit DMA Bus Master (133MBps) PCI Burst Mode 5V Interface
Power Supply	Connector J1	+5V ±5% 0.5A max. (without optional rear-I/O PHY transceiver modules) +3.3V ±0.3V 0.7A (i960RP) 0.9A (i960RD) max. +12V±5% 0.1A max. -12V±5% 0.1A max.
Temperature Humidity	Commercial Grade Version	operating temperature 0-70°C humidity 5-90% non condensing

specifications are subject to change without further notice

CPU Failure		LED1
UART Access		LED2
Local Access		LED3

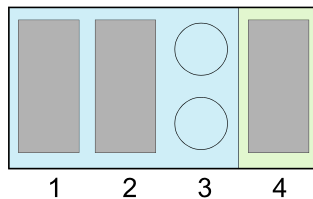
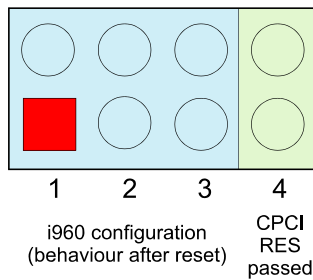
Jumper

JCLK	CPU clock local/CPCI
JCNF	CPU behaviour after reset, effects of CPCI reset on CU1

Internal Connectors

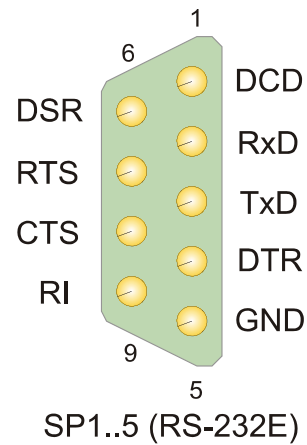
CJTAG	JTAG test port
ISPCON	ispGAL programming port
JACCBUS	I ² C-Bus expansion slot

JCNF



JCNF example configuration:

- (1) local CPU idle after CPCI reset
- (2) local CPU accepts CPCI config cycles
- (3) no internal CPU selftest after CPCI reset
- (4) CPCI reset passed through to local reset





CU9-1-BASE Rear-I/O Transition Board with CU7/CU8 PHY Modules

The rear-I/O signals, derived from the CU1-CHORUS, are passed via its CPCI connectors J4/J5, across the backplane, to the additionally available transition board CU9-1-BASE. There are sixteen CU9-internal headers (H1..H16) provided on-board for attachment of up to 16 rear-I/O PHY interface modules of the CU7/CU8 series across micro-ribbon flat cables. The PHY interface modules can be directly mounted to the 6U/12HP back panel of the CU9-1-BASE transition board. In order to avoid possible signal conflicts, your CompactPCI system must be stuffed with a suitable P4/P5 backplane for rear-I/O (J4 on the CU1-CHORUS is coded with a brown key). A single slot P4/P5 backplane is available from EKF (see ordering information table).



Ordering Information		
Alias	Ordering No.	Short Description
CHORUS	CU1-1-CHORUS	6U, <i>CompactPCI</i> 16-port serial asynchronous interface subsystem with i960RP CPU/bridge, 4MB Flash, 8MB DRAM, MON960, 5 ports configured as RS-232 directly available from the front panel, all ports additionally routed across optional J4/J5 as TTL level signals for use with rear I/O transition board and PHY interface modules
	CU7-1-RS485	RS-485/RS-422 Rear I/O PHY interface module, 1 port, 2.5Mbps two wire transmission line (half-duplex party line), electrically isolated
	CU7-2-RS485	RS-485/RS-422 Rear I/O PHY interface module, 1 port, 2.5Mbps 4-wire transmission line (full-duplex point-to-point), electrically isolated
	CU8-1-RS232	RS-232E/V.28 rear-I/O PHY interface module, including flat cable assembly
	CU9-1-BASE	Transition board, bridging function between CU1-CHORUS (J4/J5) and rear-I/O PHY interface modules, 16 ports, 6U/12HP back panel, be sure to order the CU1-CHORUS with built in J4/J5 connectors for rear-I/O
	932.2.01.000	Single slot P4/P5 rear-I/O backplane, suitable for CU1-CHORUS and CU9-BASE

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