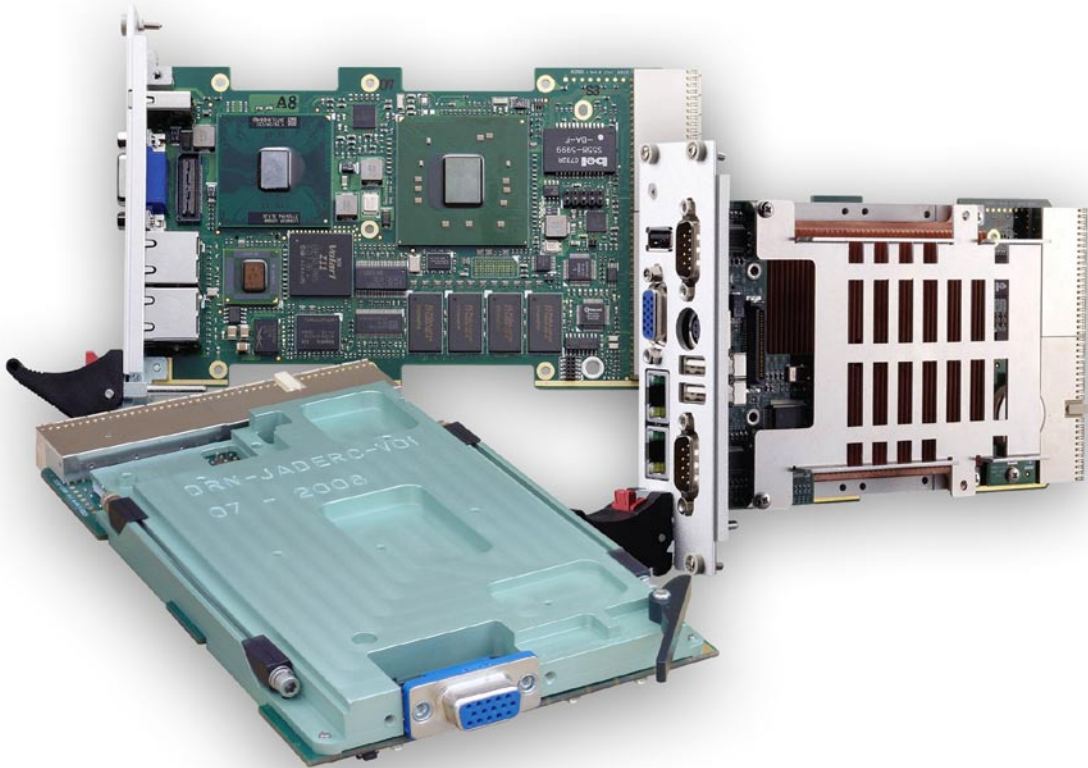


# » ITC-320 «



## Rugged Blade PC

- » Performance/Dissipation matching your application
- » Highest Versatility: PCIe, SATA, Gigabit Ethernet, Graphics, USB, GPIO
- » Air-Cooled and Rugged Conduction-Cooled builds
- » 10-Year Long Life Cycle

# ITC-320

## Rugged Blade PC

The Kontron's ITC-320 series expands Kontron' Intel® single and multi-core blade SBC portfolio with a set of full-fledge I/O embedded PCs enabling the design of cost effective, high performance embedded computers to meet the new challenges in transport, medical and defense applications.

The ITC-320 series use long life cycle chipsets from the Intel® Embedded Architecture in order to protect customers investments.

### » Three Soldered CPUs to better match customers' requirements:

#### » Intel® Celeron®-M ULV

Running at 1.07 GHz for low power dissipation, this single core processor features 1 MB of on-die Level 2 cache and a 533 MHz Front Side Bus (FSB).

#### » Intel® Core™ Duo LV

Running at 1.2 GHz, this CPU is a good compromise between performance and power dissipation. The Intel® Core™ Duo is a dual-core processor which features a large on-die 2 MB Level 2 cache and support a 533 MHz FSB. For image and digital image processing applications, the Intel® Core™ Duo supports the MMXTM™ technology enhanced with streaming SIMD instructions Extensions 2 and 3 (SSE2 and SSE3).

#### » Intel® Core™ 2 Duo LV

Running at 1.5 GHz, this CPU is the best choice for intensive data and signal processing. The Intel® Core™ 2 Duo is a dual-core processor which supports Intel® 64 architecture and full compatibility with IA-32 software. A large on-die 4 MB Level 2 cache with Advanced Transfer Cache Architecture and Supplemental Streaming SIMD Extensions 3 (SSSE3) make the Intel® Core™ 2 Duo an extremely efficient processor for Digital Signal Processing applications. The Intel® Core™ 2 Duo features a 667 MHz FSB.

### » Soldered DDR2 Memory with the support of ECC for a better reliability

The ITC-320 is available with 1 GB of DDR2-400 SDRAM. 2 GB is available on demand. The SDRAM is managed by the integrated Memory Controller Hub and I/O Controller Hub (IMCH and IICH) Intel® 3100. Error Correction and Control (ECC) feature is supported by the IIMCH.

### » Outstanding number of storage interfaces

» The ITC-320 features four SATA-150 ports to interface with a large number of devices. Three are available on the rear J2 connector, and the fourth is routed on the 8HP option for connecting a 2.5" hard disk drive.

» In addition, the ITC-320 support an USB 2.0 Low-Profile Flash Disk module.

Three USB 2.0 ports are available, one on the front panel (to easily download files from external devices) and two on the rear J2 connectors. Two additional USB 2.0 ports are available on the 8HP build version front panel.

### » Configurable Dual Gigabit Ethernet ports

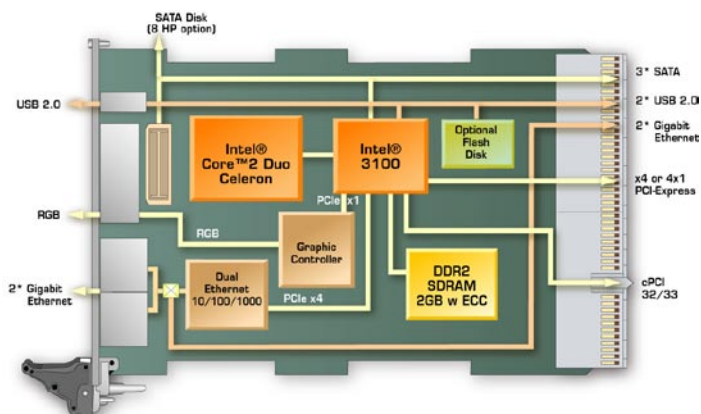
The Dual Gigabit Ethernet controller is directly interfaced to the IIMCH using a PCI-Express x4 link in order to provide an optimum throughput. The two ports can be software configured to be routed either on the front (on RJ-45 connectors) or on the rear (J2 connector) on easy to connect PICMG 2.16 type pin-out. The rear Gigabit Ethernet ports are routed to two RJ-45 connectors on the Rear Transition Module (RTM).

### » CompactPCI backplane supporting PCI-Express x4 or 4x1 interfaces

» The ITC-320 meets the CompactPCI PICMG 2.0 Rev. 3.0 compatible recommendation. It features a system master PCIbus 32-bit/33 MHz interface able to drive 7 peripheral slots. When several ITC-320 are planned to be plugged onto the same cPCI bus, a satellite version, without PCIbus shall be used. Please, contact Kontron.

» When high throughput, PCI compliant interfacing is required, the ITC-320 features a PCI-Express port x4 configurable as four x1 links onto rear J2 connector. In order to guaranty an optimum signal integrity of the PCI-Express link, the ITC-320 can be provided with a 5 GHz HSHM connector. Please, contact Kontron.

## ITC-320



### » Supervisory Functions

The integrated IMCH features watchdog timer and RTC which meets embedded use. In addition, the I2C port of the IMCH of the ITC-320 is accessible of the rear J2 connector at the standard IPMI pin-out, to ease shelf management monitoring.

### » Designed to meet the requirements of harsh environments

The ITC-320 has been designed so that the same PCB can be used in various builds able to meet a wide range of operating temperatures, from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ , VITA 47 CC4 temperature class. The ITC-320 exists in a rugged conduction-cooled version for being used in harsh environments. The ITC-320 featuring the Intel® Core™2 Duo LV processor has been qualified at maximum processor speed of 1.5 GHz to meet VITA 47 CC3 operating temperature range up to  $+75^{\circ}\text{C}$ .

### » 10-Year Long Life Cycle

Investing in a new project is always a challenge and risky. Extending the lifetime of an application to the possible maximum is therefore a critical issue to save the development investments. The ITC-320 has been designed with long life cycle components. Beyond the standard commercial availability of components, Kontron offers services able to procure products over 10 years.

### » Unique Features

- » Fully soldered components for higher shock vibration resistance
- » PCI-Express connectivity on backplane (HSHM connector option required)
- » Quad SATA-150 interfaces
- » 10-year long life cycle
- » Rugged Conduction-cooled version

## Technical Information

### System processor

Onboard soldered processor as build option :

- Intel® Core™2 Duo LV (L7400) 1.5 GHz, 4 MB L2 cache, SSE3, 667 MHz FSB, 17W
- Intel® Core™ Duo (U2500) 1.2 GHz, 2 MB L2 cache, 533 MHz FSB, 9W
- Intel® Celeron® M Proc ULV(423) 1.07 GHz, 1 MB L2 cache, 533 MHz FSB, 5.5W
- Passive cooling for all builds within 4HP height.
- Forced air cooling at specific flow rate is required depending on the processor version.

### Integrated Chipset

Intel® 3100 integrated MCH (Memory Controller Hub) and ICH (I/O Controller Hub).

#### FSB port to processor

533/667 MHz

#### Watchdog Timer

2-stage, system reset and nmi Programmable Timer

#### RTC

Integrated in chipset

#### GPIOs

7 available on rear J2

### Memory

#### System Memory

1 GB of DDR2-400 with ECC - 2 GB available on request

#### System Flash

16 Mbit FWH Flash Memory

#### User Flash

Socket for USB Flash Disk, Low Profile, 2.54 pitch connector, 4, 8 and 16 GB sizes are available

#### HDD

Onboard 2.5" SATA mounting within 8HP mezzanine

### I/O Connectors

#### Gigabit Ethernet

Dual Ports configurable either on front RJ-45 or rear J2. PCI-e x4 interface to host

#### Graphics

64-bit 2D graphics engine on PCI-e x1. VGA graphics connector available as option in RC build for use in extended operating temperature from  $-20^{\circ}\text{C}$ .

Analog VGA interface on front. Associated 32 MB of DDR2 SDRAM. Integrated 24-bit true-color RAMDAC with 230 MHz pixel clock

### CompactPCI Interfaces

PICMG 2.0 Rev. 3.0 compatible

32-bit/ 33MHz PCIbus

5V or 3.3V PCI signaling from backplane

System Slot only

Supports up to 7 devices

Drone mode (or ‚Satellite‘, ie. without PCIbus) option on request

### Front Panel Interfaces

#### 4HP Air Cooled

Ethernet (x2): RJ-45 with LEDs

VGA: VGA-CRT 15-pin D-Sub connector

USB: 4-pin Type-A connector

Control: Reset button, LEDs

#### 8HP Air Cooled (In addition to 4HP)

COM3,4 (x2): 9-pin D-Sub connectors

USB (x2): 4-pin Type-A connector

PS/2: 6-pin mini-DIN connector

### Rear I/O via J2

Two USB 2.0 ports

Two Gigabit Ethernet Ports

Three SATA-150 Ports

Two TTL-level COM ports

Seven GPIOs

I2C Management bus

PCI-Express x4 Port, configurable in 4x1 (HSHM connector option required)

## Technical Information

|                          |   |
|--------------------------|---|
| <b>Power Consumption</b> | Under WindowsXP: Idle / 100 % CPU       |
|                          | - Intel® Core™ 2 Duo 1.5 GHz: 29W / 36W |
|                          | - Intel® Core™ Duo 1.2 GHz: 24W / 27W   |
|                          | - Intel® Celeron® M 1.07 GHz: 22W / 24W |

## Environmental Specifications

|                                   | SA<br>Standard Commercial          | RC<br>Rugged Conduction-Cooled                            |
|-----------------------------------|------------------------------------|---|
| <b>Conformal Coating</b>          | Optional                           | Standard  |
| <b>Airflow</b>                    | 1.5 m/s without throttling at 55°C | NA  |
| <b>Temperature</b>                | VITA 47-Class AC1                  | VITA 47-Class CC4 (CC3 full speed for Intel® Core™ 2 Duo) |
| <b>Cooling Method</b>             | Convection                         | Conduction  |
| <b>Operating</b>                  | 0° to +55°C                        | -40° to +85°C (CC4) or +75°C (CC3)                        |
| <b>Storage</b>                    | -45° to +85°C                      | -45° to +85°C   |
| <b>Vibration Sine (Operating)</b> | 20/500 Hz: 2g                      | 22/2,000 Hz: 2g   |
| <b>Random</b>                     | VITA 47-Class V1                   | VITA 47-Class V3  |
| <b>Shock (Operating)</b>          | 20g/11 ms Half Sine                | 40g/11 ms Half Sine                                       |
| <b>Altitude (Operating)</b>       | 1,640 to 15,000 ft                 | -1,640 to 50,000 ft                                       |
| <b>Relative Humidity</b>          | 90% without condensation           | 95% without condensation                                  |

## Ordering Information

| Article                               | Order Code        | Description   |
|---------------------------------------|-------------------|---|
| <a href="#">ITC-320</a>               | ITC320-SA52-00000 | 4HP, Intel® Core™ 2 Duo (L7400) 1.5 GHz, 4MB L2, 1GB SDRAM                                    |
| <a href="#">ITC-320</a>               | ITC320-SA22-00000 | 4HP, Intel® Core™ Duo (U2500) 1.2 GHz, 2MB L2, 1GB SDRAM                                      |
| <a href="#">ITC-320</a>               | ITC320-SA02-00000 | 4HP, Intel® Celeron® M (423) 1.07 GHz, 1MB L2, 1GB SDRAM                                      |
| <a href="#">ITC-322</a>               | ITC322-SA52-00000 | 8HP, Intel® Core™ 2 Duo (L7400) 1.5 GHz, 4MB L2, 1GB SDRAM                                    |
| <a href="#">ITC-322</a>               | ITC322-SA22-00000 | 8HP, Intel® Core™ Duo (U2500) 1.2 GHz, 2MB L2, 1GB SDRAM                                      |
| <a href="#">ITC-322</a>               | ITC322-SA02-00000 | 8HP, Intel® Celeron® M (423) 1.07 GHz, 1MB L2, 1GB SDRAM                                      |
| <a href="#">ITC-320</a>               | ITC320-RC52-00000 | 4HP, Intel® Core™ 2 Duo (L7400) 1.5 GHz, 4MB L2, 1GB SDRAM                                    |
| <a href="#">ITC-320</a>               | ITC320-RC52-G0000 | 4HP, Intel® Core™ 2 Duo (L7400) 1.5 GHz, 4MB L2, 1GB SDRAM, version with VGA (-20°C to +75°C) |
| <a href="#">ITC-320</a>               | ITC320-RC22-00000 | 4HP, Intel® Core™ Duo (U2500) 1.2 GHz, 2MB L2, 1GB SDRAM                                      |
| <a href="#">ITC-320</a>               | ITC320-RC02-00000 | 4HP, Intel® Celeron® M (423) 1.07 GHz, 1MB L2, 1GB SDRAM                                      |
| <a href="#">RTM</a>                   | PB-IT3-000        | Rear Transition Module  |
| <a href="#">USB Flash Disk</a>        | FDM-USB-4GB-00    | 4GB USB Flash Disk Module   |
| <a href="#">USB Flash Disk for RC</a> | FDM-USB-4GB-IV    | 4GB USB Flash disk for use in RC environments   |
| <a href="#">Rack</a>                  | RTOP-4S200-00     | 4-slot 200W Development Rack  |
| <a href="#">VGA tool</a>              | ADAP-VGA          | Tooling board with VGA connector for IEEE -RC boards  |

## CORPORATE OFFICES

### Europe, Middle East & Africa

Oskar-von-Miller-Str. 1  
85386 Eching/Munich  
Germany  
Tel.: +49 (0)8165/ 77 777  
Fax: +49 (0)8165/ 77 279  
info@kontron.com

### North America

14118 Stowe Drive  
Poway, CA 92064-7147  
USA  
Tel.: +1 888 294 4558  
Fax: +1 858 677 0898  
info@us.kontron.com

### Asia Pacific

17 Building, Block #1, ABP.  
188 Southern West 4th Ring Road  
Beijing 100070, P.R.China  
Tel.: + 86 10 63751188  
Fax: + 86 10 83682438  
info@kontron.cn

