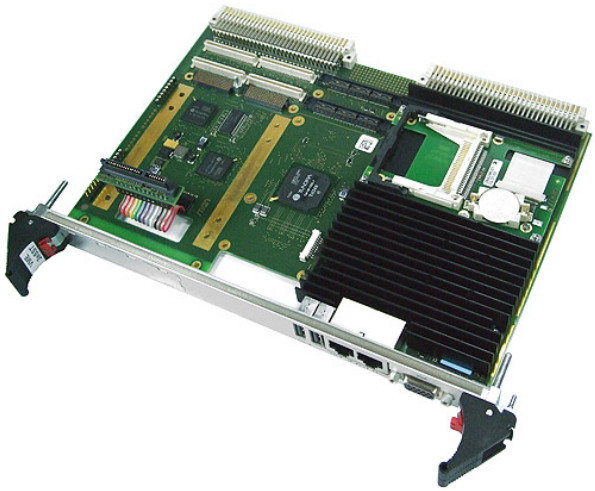
Embedded Solutions

A19 - 6U VME 2eSST Intel® Core™ Duo / Core 2 Duo SBC



- **Intel® Core™ 2 Duo T7400 or L7400**
- **Core Duo T2500, U2500 or L2400**
- **1-slot 2eSST VMEbus master and slave**
- **Up to 4 GB DDR2 DRAM soldered**
- **2 SATA, 1 PATA interface**
- **1 VGA at front**
- **2 SDVO, HD audio via mezzanine**
- **2 Gb Ethernet at front, 2 Gb Ethernet at P0**
- **2 USB at front, 4 USB via mezzanine**
- **1 UART via mezzanine**
- **1 XMC or PMC, 1 mezzanine card slot**
- **PCI Express® six x1 links**
- **Board controller**

The A19 6U single-slot VMEbus SBC supports a variety of Intel® Core™ Duo and Core 2 Duo processors from the high-end 2.16 GHz T7400 to the low-voltage dual-core versions down to a selection of single-core Celeron® M types. It is designed especially for systems which require high computing and graphics performance and low power consumption in a typical Windows® environment or under VxWorks®.
Using the new Tundra TSI148 bridge controller it provides 2eSST performance levels while maintaining backwards compatibility with older standards such as VME64 and VME32.
The standard I/O available at the front panel of the A19 includes graphics on a VGA connector, two Gigabit Ethernet and two USB 2.0 interfaces.
The I/O of the A19 can directly be extended by different mezzanine cards. Mezzanine functions specifically include another two Gigabit Ethernet channels available at the optional P0 rear connector to support Ethernet on the backplane complying with ANSI/VITA 31.1-2003 as well as four USB 2.0 ports, one of which can alternatively be used to realize a UART. Further mezzanine functions may also include digital video outputs for flat panel connection via DVI, and HD audio.
In terms of mass storage two SATA ports (one onboard instead of the PMC or XMC and one on the mezzanine card) are available for connection of an onboard hard disk or for building up RAID systems. One PATA interface supports the onboard CompactFlash® slot.
The working memory comprises up to 4 GB DDR2 DRAM which is soldered to guarantee optimum shock and vibration resistance.
A total of six PCI Express® lanes for high-speed communication (such as Gb Ethernet) are supported on the A19. 2 x1 PCIe® links are used for the two onboard Ethernet interfaces, another 2 x1 links support the XMC slot, 1 x1 link is available on a specific mezzanine card and 1 x1 link is used for connection of the VMEbus bridge.
Supervision of the processor and board temperature as well as a watchdog for monitoring the operating system complete the functionality of the SBC.
The A19 comes with a tailored passive heat sink within 4 HP height. However, forced air cooling is always required inside the system.
Equipped with Intel® components exclusively from the Intel® Embedded Line, the A19 has a guaranteed minimum standard availability of 5 years.
Its robust design make the A19 especially suited for rugged environments with regard to extended operation temperature, shock and vibration according to applicable DIN, EN or IEC industry standards. It is also ready for coating for use in humid and dusty environments. The wide range of industrial applications include for example monitoring, vision and control systems as well as test and measurement. Main target markets comprise industrial automation, security and infotainment, traffic and transportation, shipbuilding, medical engineering and robotics.

mikro elektronik
gmbh · nürnberg

Embedded Solutions

Technical Data

CPU
- Up to Intel® Core™ 2 Duo T7400
  - Dual-core 64-bit processor
  - Up to 2.16GHz processor core frequency
  - Up to 667MHz front-side bus frequency
- Chipset
  - Northbridge: Intel® 945GME Express
  - Southbridge: Intel® ICH7-M DH

Memory
- 4MB L2 cache integrated in Core 2 Duo
- Up to 4GB SDRAM system memory
  - Soldered
  - DDR2
  - 667MHz memory bus frequency
  - Dual-channel, 2x64 bits
- CompactFlash® card interface
  - Via onboard IDE
  - Type I
  - True IDE
  - DMA support
- 8Mbits boot Flash
- Serial EEPROM 2kbits for factory settings

Mass Storage
- Parallel IDE (PATA)
  - One IDE port for local CompactFlash®
- Serial ATA (SATA)
  - One channel for onboard hard disk
  - One channel via mezzanine card connector
  - Transfer rates up to 150MB/s
  - RAID level 0/1 support

Graphics
- Integrated in 945GME Express chipset
  - 200/250MHz 256-bit graphics core
- VGA connector at front panel
- Two SDVO ports available via mezzanine-card connector
  - One additional DVI connector at front panel optional via mezzanine card

I/O
- USB
  - Two USB 2.0 ports via Series A connectors at front panel
  - Four USB 2.0 ports via mezzanine-card connector
  - Two USB 2.0 ports via rear I/O
  - UHCI implementation
  - Data rates up to 480Mbits/s
- Ethernet
  - Two 10/100/1000Base-T Ethernet channels at front panel
  - RJ45 connectors at front panel
  - Ethernet controllers are connected by two x1 PCIe® links
  - Onboard LEDs to signal activity status and connection speed
  - Two 10/100/1000Base-T Ethernet channels via mezzanine card on backplane (PICMG 2.16 or on transition module)
  - Via one x1 PCIe® link and without LEDs
- High Definition (HD) audio
  - Accessible via mezzanine-card connector
- UART
  - One RS232 interface optionally at front panel via D700 mezzanine card

Front Connections
- VGA
- Two USB 2.0 (Series A)
- Two Ethernet (RJ45)

Rear I/O
- USB 2.0, two ports
- PMC rear I/O
- Optional rear I/O via mezzanine card D700
  - One SATA channel
  - Ethernet 1000Base-T, two ports
  - Three USB

Mezzanine Slot
- One slot usable for PMC or XMC
- XMC slot
  - Compliant with XMC standard VITA 42.3-2006
  - Two x1 PCI Express® links
- PMC slot
  - Compliant with PMC standard IEEE 1386.1
  - PCI / PCI-X 32/64 bit, 33/66/133MHz, 3.3V V(I/O)
  - One x1 PCI Express® link via PCI Express® to PCI bridge
  - PMC I/O module (PIM) support via J14

Miscellaneous
- Board controller
- Real-time clock, buffered by a GoldCap or alternatively a battery
- Watchdog timer
- Temperature measurement
- One user LED
- Reset button

PCI Express®
- Two x1 links to connect local 1000Base-T Ethernet controllers
- One x1 link for extension through mezzanine-card connector
- Two x1 links to connect XMC (or one x1 link for connection of PMC via PCI Express® to PCI bridge)

Technical Data

- One x1 link to connect the Tundra VME bridge via a PCI Express® to PCI-X bridge
- Data rate up to 250MB/s in each direction (2.5 Gbits/s per lane)

VMEbus

- Tundra TSI148 controller
- Compliant with VME64 Specification
- Supports VME32, VME64, 2eVME and 2eSST (VITA 1.5)
- Maximum data rate 250 MB/s (limited by PCI Express® link)
- Slot-1 function with auto-detection
- Master
  - D08:D16:D32:D64:A16:A24:A32:A64:BLT:MBLT:RMW
- Slave
  - D08:D16:D32:D64:A16:A24:A32:A64:BLT:MBLT
- DMA
- Mailbox functionality
- Bus timer
- Location Monitor
- Interrupter D08(O):I(7-1):ROAK
- Interrupt handler D08(O):IH(7-1)
- Single level 3 fair requester
- Single level 3 arbiter

Electrical Specifications

- Supply voltage/power consumption:
  - +5V (-3%/+5%), approx. 9.5A
  - +3.3V (-3%/+5%), approx. 1.4A (without PMC or XMC module)

Mechanical Specifications

- Dimensions: standard double Eurocard, 233.3mm x 160mm
- Front panel: 4HP with ejector
- Weight:
  - Without XMC/PMC and mezzanine board: 400g
  - With XMC/PMC and mezzanine board: 530g

Environmental Specifications

- Temperature range (operation):
  - 0..+45°C
  - 0..+60°C (version with Celeron® M processor)
  - Airflow: min. 15m³/h (1.5m/s)
- Temperature range (storage): -40..+85°C
- Relative humidity (operation): max. 95% non-condensing
- Relative humidity (storage): max. 95% non-condensing
- Altitude: -300m to + 3,000m
- Shock: 15g/11ms (EN 60068-2-27)
- Bump: 10g/16ms (EN 60068-2-29)
- Vibration (sinusoidal): 1g/ 10..150Hz (EN 60068-2-6)
- Conformal coating on request

MTBF

- 184,503h @ 40°C according to IEC/TR 62380 (RDF2000)

Safety

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

EMC

- Tested according to EN 55022 Class A (radio disturbance), EN 61000-4-2 (ESD), EN 61000-4-4 (burst) and EN 61000-4-5 (surge)

BIOS

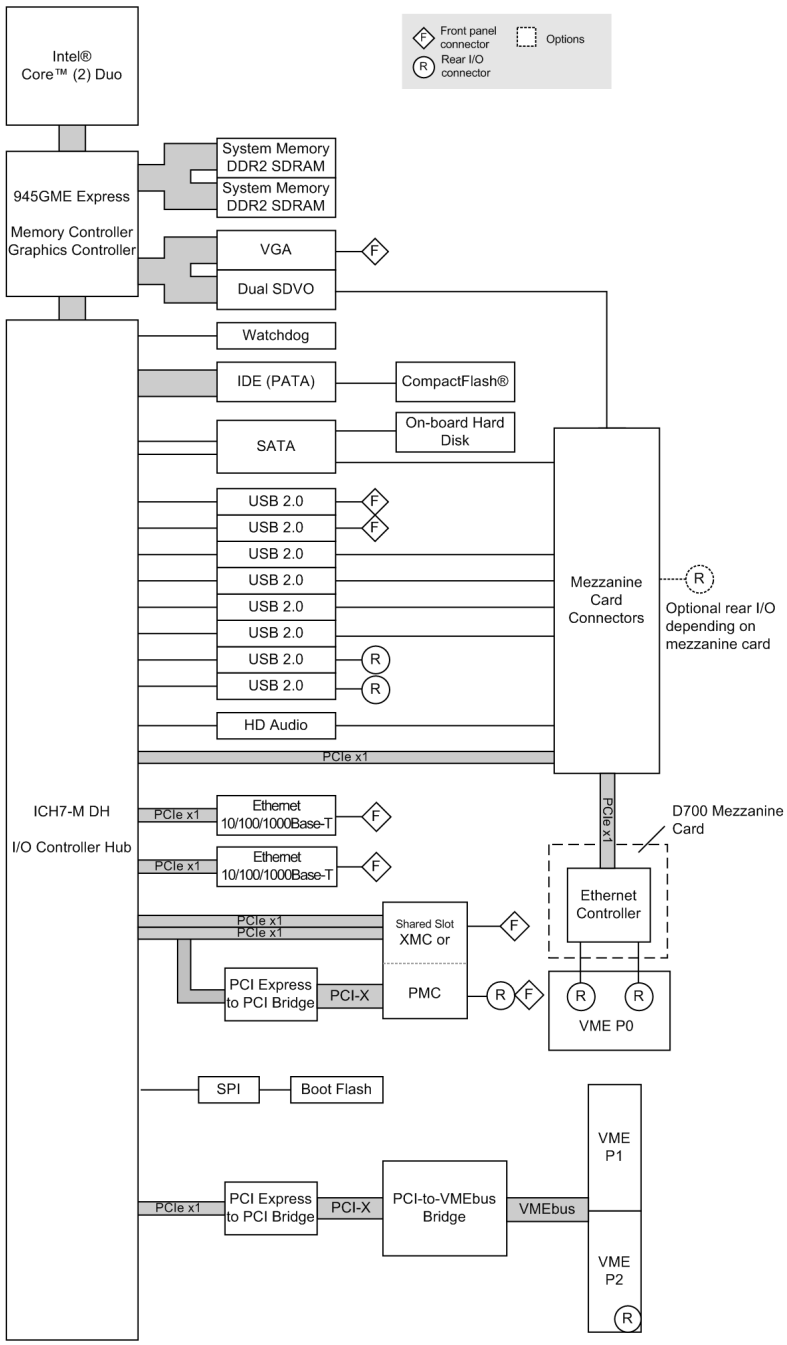
- Award BIOS

Software Support

- Windows®
- Linux
- VxWorks® (on request)
- QNX® (on request)
- Intel® Virtualization Technology, allows a platform to run multiple operating systems and applications in independent partitions; one computer system can function as multiple "virtual" systems
- For more information on supported operating system versions and drivers see Software.

Embedded Solutions

Diagram



mikro elektronik gmbh • nürnberg

Configuration & Options

Standard Configurations

Article No.	CPU Type	System RAM	XMC/PMC	P0 Ethernet	Operation Temp.
01A019-00	T7400	2 GB DDR2	1 slot	No	0..+45°C

Options

CPU

- Core 2 Duo T7400, 2.16GHz
- Core 2 Duo L7400, 1.5GHz LV
- Core Duo T2500, 2GHz
- Core Duo L2400, 1.66GHz LV
- Core Duo U2500, 1.2GHz ULV
- Celeron® M 423, 1.06 GHz

Memory

- System RAM
  - 512 MB, 1 GB, 2 GB or 4 GB
- CompactFlash®
  - 0 MB up to maximum available

Graphics

- One DVI-D connector at front via mezzanine card

I/O

- Ethernet
  - 9-pin D-Sub connector with one or two 10/100Base-T ports instead of two RJ45 connectors
  - Active Management Technology for remote service

I/O with mezzanine card

- One RS232 UART interface via RJ45

Rear I/O

- One SATA channel via mezzanine card
- Two SDVO ports via mezzanine card
- Four USB ports via mezzanine card
- Two Ethernet via mezzanine card (PICMG 2.16 or on transition module)
- HD Audio via mezzanine card
- One x1 PCIe® link via mezzanine card instead of two Ethernet

Please note that some of these options may only be available for large volumes. Please ask our sales staff for more information.

Embedded Solutions

Ordering Information

Standard Hardware

01A019-00 Intel Core 2 Duo T7400, 2.16 GHz, 2 GB DDR2 DRAM, P0 not mounted, 0..+45°C

Related Hardware

02D700-00 1 DVI, 1 COM, PICMG 2.16 (2 Gb Ethernet) for D9, A19 and compatible cPCI and VME SBCs, 0..+55°C

Memory

0751-0032 CompactFlash card, 8 GB, Type I, -40..+85°C, fixed bit set

0751-0038 CompactFlash card, 256 MB, Type I, removable, -40..+85°C

0751-0039 CompactFlash card, 512 MB, Type I, removable, -40..+85°C

0751-0040 CompactFlash card, 1 GB, Type I, fixed bit set, -40..+85°C

0751-0041 CompactFlash card, 2 GB, Type I, fixed bit set, -40..+85°C

0751-0042 CompactFlash card, 4 GB, Type I, fixed bit set, -40..+85°C

Miscellaneous

0710-0025 SATA hard disk 2.5", 80 GB, 5400 rpm, 24h/7d, -30..+85°C; N.B.: between -30°C to -20°C power-on time is 12 s typ. (incl.stand-offs and mounting screws)

Software: OS independent

13Y001-06 MDIS5 low-level driver sources (MEN) for LM63 on SMBus for F14, F15, F17, F18, D9, D601, A19 and A20

13Y002-06 MDIS5 low-level driver sources (MEN) for F14, F15, F17, F18, D9, D601, A19 and A20 board monitoring

13Y004-06 MDIS5 low-level driver sources (MEN) for generic SMBus driver for F14, F15, F17, F18, D9, D601, F600 and F601, A19 and A20

13Y007-06 MDIS5 low-level driver sources (MEN) for F14, F15, F17, F18, D9, D601, A19 and A20 board controller

Software: Linux

13Z014-90 Linux device driver (MEN) for PCI-to-VME bridge on A12, A13, A14, A15, A17, A19, A20 and B11

Software: Windows

13F014-77 Windows Installset (MEN) for F14, F15, F17, F18, D9, D601, A19 and A20

13T001-70 Windows network driver (Intel) for F14, F15, F17, F18, D9, D6, D7, D601, A19, A20 and P601, P602

13T003-70 Windows chipset driver (Intel) for F14, F15, F17, F18, F18E, F19P, D9, D6, D7, D601, A19 and A20

13T005-70 Windows USB2UART driver (FTDI) for F14, F15, F17, F18, F19P, D9, A19, A20, XM2 and XM50 hosts

13T006-70 Windows HD Audio driver (Realtek) for F14, F15, F17, F18, D9 and A19

13T007-70 Windows chipset graphics driver (Intel) for F15, F17, D9, A19 and A20

Software: VxWorks

10A019-60 VxWorks 6.6 BSP for A19 and A20

Software: Firmware/BIOS

14A020-00 System BIOS for A19 and A20

Documentation

20A019-00 A19 User Manual

For the most up-to-date ordering information and direct links to other data sheets and downloads, see the A19 online data sheet under » www.men.de.

mikro elektronik
gmbh · nürnberg

Embedded Solutions

Contact Information

Germany
MEN Mikro Elektronik GmbH
Neuwieder Straße 5-7
90411 Nuremberg
Phone +49-911-99 33 5-0
Fax +49-911-99 33 5-901
E-mail info@men.de
www.men.de

France
MEN Mikro Elektronik SA
18, rue René Cassin
ZA de la Châtelaine
74240 Gaillard
Phone +33 (0) 450-955-312
Fax +33 (0) 450-955-211
E-mail info@men-france.fr
www.men-france.fr

USA
MEN Micro, Inc.
24 North Main Street
Ambler, PA 19002
Phone (215) 542-9575
Fax (215) 542-9577
E-mail sales@menmicro.com
www.menmicro.com

mikro elektronik
gmbh • nürnberg