DV-1000

9/8th Gen. Intel® Core™ Series High Performance and Essential Rugged Embedded Computer

HIGH-PERFORMANCE | SIMPLICITY

Overview

CONTACT

The DV-1000, with 9/8th Gen Intel® Core™ processor, is a fanless and rugged embedded computer optimized for edge computing applications. The high-performance DV-1000 processes data and makes real-time decisions at the edge, enabling enterprises to take immediate action on real-time data. The computer brings high-performance computing and industrial durability together in a compact footprint embedded computer, providing reliable long-time operation for mission-critical and space-limited applications in machine vision, manufacturing, railway infotainment, and smart city applications.

Key Features

- Supports 9/8th Gen Intel® Core™ i7/i5/i3 or Pentium®/Celeron® processors (up to 65W)
- Compact size (224 x 162 x 64 mm)
- 1 x M.2 2280 key M socket, auto-detection for NVMe/SATA SSD
- 1 x M.2 2230 key E for Intel® CNVi/wireless module
- 2 x Full-size Mini PCIe sockets for module expansion
- Optional CMI/MEC modules for I/O expansion
- Wide operating temperature: -40°C to 70°C
- Military standard (MIL-STD-810G) shock & vibration proof
- Railway EMC standard EN50155 (EN 50121-3-2 only) certified

Certifications

-40~70°C MIL-STD 810G EN50121-3-2 FC CE MEC TECHNOLOGY CMI TECHNOLOGY CFM TECHNOLOGY

Strong Computing Power

The DV-1000 features a 9/8th Generation Intel® Core™ i7/i5/i3 (Coffee Lake-R S series) processor and Intel® H310 chipset, supporting up to 32 GB of DDR4 2666 MHz memory. The DV-1000 provides plenty of power for heavy multitasking workloads and applications.

Compact Size

The DV-1000 packs its impressive computing power in a compact size computer with a footprint only about half the size of one sheet of A4 paper. This small size makes the DV-1000 easy to install anywhere you can imagine, especially in space-constrained industrial environments like a small cabinet in a factory.

Essential I/O and Connectivity

DV-1000 has the most frequently used I/O (LAN, USB, COM ports), analog and digital displays (VGA and DP), and storage options (SATA HDD/SSD, mSATA, or NVMe) sufficient for most industrial applications.

Expandable Extra I/O and Functionality

For adding extra I/O or functions Cincoze offers proprietary Combined Multiple I/O (CMI) modules, Control Function Module (CFM), and also Mini-PCIe Expansion Card Module (MEC). The CMI modules support HDMI, DisplayPort, COM and DIO, MEC modules support GbE LAN and USB expansion, and CFM modules have IGN function.

- 35W TDP Processor : -40°C to 70°C
- 65W TDP Processor : -40°C to 60°C (with external fan)

Reliable Cooling and Wide Operating Temperature

Even in a small form factor, the DV-1000 has an excellent thermal design enabling wide operating temperature from -40°C to 70°C with only passive cooling. An external fan is available for an active cooling solution for higher temperature operations and to ensure continuous operation for space constraint cases or processing power requirements.

Industry Certifications

The DV-1000 has been tested to meet a range of industry standards, including MIL-STD-810G to ensure reliable operation under harsh shock and vibration, and EMC compliance EN50155 (EN 50121-3-2 only) for rolling stock deployments.

Specifications

Model Name	DV-1000
System	
Processor	9th Generation Intel® Coffee Lake-R S Series CPU: ▪ Intel® Core™ i7-9700E 8 Cores Up to 4.4 GHz, TDP 65W ▪ Intel® Core™ i5-9500E 6 Cores Up to 4.2 GHz, TDP 65W ▪ Intel® Core™ i3-9100E 4 Cores Up to 3.7 GHz, TDP 65W ▪ Intel® Core™ i7-9700TE 8 Cores Up to 3.8 GHz, TDP 35W ▪ Intel® Core™ i5-9500TE 6 Cores Up to 3.6 GHz, TDP 35W ▪ Intel® Core™ i3-9100TE 4 Cores Up to 3.2 GHz, TDP 35W 8th Generation Intel® Coffee Lake S Series CPU: ▪ Intel® Core™ i7-8700 6 Cores Up to 4.6 GHz - 12M Cache, TDP 65W ▪ Intel® Core™ i5-8500 6 Cores Up to 4.1 GHz - 9M Cache, TDP 65W ▪ Intel® Core™ i3-8100 4 Cores 3.6 GHz - 6M Cache, TDP 65W ▪ Intel® Core™ i7-8700T 6 Cores Up to 4.0 GHz - 12M Cache, TDP 35W ▪ Intel® Core™ i5-8500T 6 Cores Up to 3.5 GHz - 9M Cache, TDP 35W ▪ Intel® Core™ i3-8100T 4 Cores 3.1 GHz - 6M Cache, TDP 35W ▪ Intel® Pentium® G5400 2 Cores 3.7 GHz - 4M Cache, TDP 58W ▪ Intel® Pentium® G5400T 2 Cores 3.1 GHz - 4M Cache, TDP 35W ▪ Intel® Celeron® G4900 2 Cores 3.1 GHz - 2M Cache, TDP 54W ▪ Intel® Celeron® G4900T 2 Cores 2.9 GHz - 2M Cache, TDP 35W
Chipset	▪ Intel H310 Chipset
Memory	▪ 1x DDR4 2666 MHz 260-Pin SO-DIMM Socket, Supports Up to 32 GB (Un-buffered and non-ECC)
BIOS	▪ AMI BIOS
Graphics	
Graphics Engine	▪ Integrated Intel® UHD Graphics 630: Core™ i7/i5/i3 ▪ Integrated Intel® UHD Graphics 610: Pentium® /Celeron®
Maximum Display Output	▪ Supports Dual Independent Display
DP	▪ 1x DisplayPort Connector (4096 x 2304@60Hz)
VGA	▪ 1x VGA Connector (1920 x 1200 @60Hz)
Audio	
Audio Codec	▪ Realtek® ALC888, High Definition Audio
Line-out	▪ 1x Line-out, Phone Jack 3.5mm
Mic-in	▪ 1x Mic-in, Phone Jack 3.5mm
I/O	
LAN	▪ 2x GbE LAN, RJ45 - GbE1: Intel® I219 - GbE2: Intel® I210
COM	▪ 2x RS-232/422/485 with Auto Flow Control (Supports 5V/12V), DB9
USB	▪ 3x 5Gbps USB 3.2 Gen1, Type A ▪ 3x 480Mbps USB 2.0, Type A
Storage	
SSD/HDD	▪ 1x 2.5" SATA HDD/SSD Bay (SATA 3.0)
mSATA	▪ 2x mSATA Socket (SATA 3.0)
M.2 SSD	▪ 1x M.2 Key M 2280 Socket, Supports SATA SSD (SATA 3.0) and NVMe PCIe
RAID	▪ Do not Support RAID Function
Expansion	
Mini PCI Express	▪ 2x Full-size Mini-PCIe Socket

SIM Socket	▪ 1x SIM Socket
M.2	▪ 1x M.2 Key E 2230 Socket, Support Intel CNVi Module
CMI (Combined Multiple I/O) Interface	▪ 1x CMI Interface for optional CMI Display Module Expansion ▪ 2x CMI Interface for optional CMI I/O Module Expansion
CFM (Control Function Module) Interface	▪ 1x CFM IGN Interface for optional CFM-IGN Module Expansion
Other Function	
External FAN Connector	▪ 1x External FAN Connector, 4-pin Terminal Block (Support Smart Fan by BIOS)
Power Ignition Sensing	▪ Support Power Ignition Sensing Function with Delay Time Management and Selectable 12V/24V (With Optional CFM Module)
Clear CMOS Switch	▪ 1x Clear CMOS Switch
Reset Button	▪ 1x Reset Button
Instant Reboot	▪ Support 0.2sec Instant Reboot Technology
Watchdog Timer	▪ Software Programmable Supports 256 Levels System Reset
Power	
Power Button	▪ 1x ATX Power On/Off Button
Power Mode Switch	▪ 1x AT/ATX Mode Switch
Power Input	▪ 9 - 48VDC, 3-pin Terminal Block
Remote Power On/Off	▪ 1x Remote Power On/Off, 2-pin Terminal Block
Remote Power LED	▪ 1x Remote Power LED, 2-pin Terminal Block
Physical	
Dimension (W x D x H)	▪ 224.1 x 162 x 64.2 mm
Weight Information	▪ 2.22 KG
Mechanical Construction	▪ Extruded Aluminum with Heavy Duty Metal
Mounting	▪ Wall / DIN-RAIL / VESA Mount
Physical Design	▪ Fanless Design ▪ Cableess Design ▪ Jumper-less Design ▪ Unibody Design
Reliability & Protection	
Reverse Power Input Protection	▪ Yes
Over Voltage Protection	▪ Protection Range: 51~58V ▪ Protection Type: shut down operating voltage, re-power on at the preset level to recover
Over Current Protection	▪ 15A
Surge Protection	▪ 2 kV
CMOS Battery Backup	▪ SuperCap Integrated for CMOS Battery Maintenance-free Operation
MTBF	▪ 458,722 Hours - Database: Telcordia SR-332 Issue3, Method 1, Case 3
Operating System	
Windows	▪ Windows® 10
Linux	▪ Supports by project

Environment	
Operating Temperature	▪ 35W TDP Processor: -40°C to 70°C ▪ 65W TDP Processor: -40°C to 60°C (With External Fan Kit) - With extended temperature peripherals; Ambient with air flow - According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14
Storage Temperature	▪ -40°C to 85°C
Relative Humidity	▪ 95%RH @ 70°C (non-Condensing)
Shock	▪ MIL-STD-810G
Vibration	▪ MIL-STD-810G
EMC	▪ CCE, UKCA, FCC, ICES-003 Class A ▪ EN 50155 (EN 50121-3-2 Only)
EMI	▪ CISPR 32 Conducted & Radiated: Class A ▪ EN/BS EN 50121-3-2 Conducted & Radiated: Class A ▪ EN/BS EN IEC 61000-3-2 Harmonic current emissions: Class A ▪ EN/BS EN61000-3-3 Voltage fluctuations & flicker ▪ FCC 47 CFR Part 15B, ICES-003 Conducted & Radiated: Class A
EMS	▪ EN/IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV ▪ EN/IEC 61000-4-3 RS: 80 MHz to 1000 MHz: 20 V/m ▪ EN/IEC 61000-4-4 EFT: AC Power: 2 kV; Signal: 2 kV ▪ EN/IEC 61000-4-5 Surges: AC Power: 2 kV ▪ EN/IEC 61000-4-6 CS: 10V ▪ EN/IEC 61000-4-8 PFMF: 50 Hz, 1A/m ▪ EN/IEC 61000-4-11 Voltage Dips & Voltage Interruptions: 0.5 cycles at 50 Hz
Safety	▪ IEC/EN 62368-1
Fire Protection	▪ EN 45545-2

External Layout

Front

Rear

Dimensions

Unit: mm

Ordering Information

Available Models

Model No.	Description
DV-1000-R10	9/8th Gen. Intel® Core™ Series High Performance and Essential Rugged Embedded Computer

Package Checklist

▪ DV-1000 Embedded System x1	▪ Wall Mounting Kit x1
▪ CPU Thermal Pad x1	▪ Power Terminal Block Connector x 1
▪ Screw Pack x 1	▪ Remote Function Terminal Block Connector x 2
▪ External Fan Terminal Block Connector x 1	

Optional Modules and Accessories

Model No.	Description
CMI-DP01-R10	CMI Module with 1x DisplayPort
CMI-HD03-R10	CMI Module with 1x HDMI Port
CMI-COM06-R10	CMI Module with 2x RS232/422/485 Ports (Support 5V/12V)
CMI-DIO06-R10	CMI Module with 16DIO (8in 8out)
MEC-USB-M102-30	Mini-PCIe Module with 2x USB 3.2Gen1 Ports, 1x 30cm cable
MEC-LAN-M102-15	Mini-PCIe Module with 2x LAN Ports, 2x 15cm cable
UB1606-R10	Universal Bracket with DP Cutout
UB1608-R10	Universal Bracket with HDMI Cutout
UB1603-R10	Universal Bracket with 2x DB9 Cutout
UB1618-R20	Universal Bracket with DIO Cutout
UB1614-R10	Universal Bracket with 2x USB Cutout
UB1611-R10	Universal Bracket with 2x RJ45 Cutout
CFM-IGN04-R10	CFM Module with Power Ignition Sensing Function, 12V/24V Selectable
DINRAIL-R10	Diamond series DIN-RAIL Mount Kit
FAN-EX104	External Fan with 4pin Terminal Block Plug and Mounting Bracket, Support Smart Fan
GST120A24-CIN	Adapter AC/DC 24V 5A 120W with 3pin Terminal Block Plug and Tubes, Level VI
GST220A24-CIN	Adapter AC/DC 24V 9.2A 220W with 3pin Terminal Block Plug and Tubes, Level VI
GST360A24-CIN	Adapter AC/DC 24V 15A 360W with 3pin Terminal Block Plug and TUBES, Level VI
RSD-200D-24	Railway Single Output DC-DC Converter 200W / DC 24V

Note:
1. DV-1000 can only install either MEC-USB or CFM-IGN module one at a time.

Optional Module Configuration

Model No.	Description	1	2
CMI-DP01/UB1606	CMI Module with 1x DisplayPort / 1x Universal Bracket with DP Cutout for DV Series	-	V
CMI-HD03/UB1608	CMI Module with 1x HDMI / 1x Universal Bracket with HDMI Cutout for DV Series	-	V
CMI-COM06/UB1603	CMI Module with 2x RS232/422/485 Ports (Support 5V/12V) / 1x Universal Bracket with 2x DB9 Cutout for DV Series	V	V
CMI-DIO06/UB1618	CMI Module with 16DIO (8in 8out) / 1x Universal Bracket with DIO Cutout for DV Series	V	V
MEC-USB-M102-30/UB1614	Mini-PCIe Modulewith 2x USB 3.0 Ports, 1x 30cm cable / 1x Universal Bracket with 2x USB Cutout for DV Series	V	V
MEC-LAN-M102-15/UB1611	Mini-PCIe Module with 2x LAN Ports, 2x 15cm cable / 1x Universal Bracket with 2x RJ45 Cutout for DV Series	V	V

V : Compatible

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