

# DV-1000

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



## HIGH-PERFORMANCE | SIMPLICITY

### Overview

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.

- 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



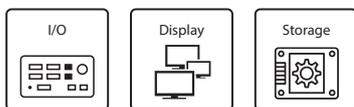


## Strong Computing Power

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

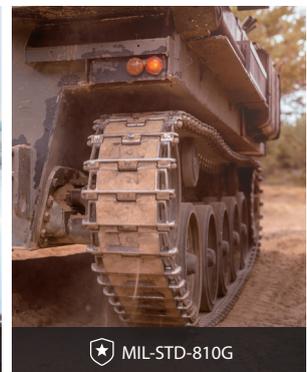
Even in a small form factor, the DV-1000 has an excellent thermal design enabling wide operating temperature from -40°C to 70°C with only passive cooling. An external fan is available for an active cooling solution for higher temperature operations and to ensure continuous operation for space constraint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



EN50121-3-2



MIL-STD-810G

## Specifications

### System

Processor	<p>9th Generation Intel® Coffee Lake-R S Series CPU:</p> <ul style="list-style-type: none"> <li>Intel® Core™ i7-9700E 8 Cores Up to 4.4 GHz, TDP 65W</li> <li>Intel® Core™ i5-9500E 6 Cores Up to 4.2 GHz, TDP 65W</li> <li>Intel® Core™ i3-9100E 4 Cores Up to 3.7 GHz, TDP 65W</li> <li>Intel® Core™ i7-9700TE 8 Cores Up to 3.8 GHz, TDP 35W</li> <li>Intel® Core™ i5-9500TE 6 Cores Up to 3.6 GHz, TDP 35W</li> <li>Intel® Core™ i3-9100TE 4 Cores Up to 3.2 GHz, TDP 35W</li> </ul> <p>8th Generation Intel® Coffee Lake S Series CPU:</p> <ul style="list-style-type: none"> <li>Intel® Core™ i7-8700 6 Cores Up to 4.6 GHz - 12M Cache, TDP 65W</li> <li>Intel® Core™ i5-8500 6 Cores Up to 4.1 GHz - 9M Cache, TDP 65W</li> <li>Intel® Core™ i3-8100 4 Cores 3.6 GHz - 6M Cache, TDP 65W</li> <li>Intel® Core™ i7-8700T 6 Cores Up to 4.0 GHz - 12M Cache, TDP 35W</li> <li>Intel® Core™ i5-8500T 6 Cores Up to 3.5 GHz - 9M Cache, TDP 35W</li> <li>Intel® Core™ i3-8100T 4 Cores 3.1 GHz - 6M Cache, TDP 35W</li> <li>Intel® Pentium® G5400 2 Cores 3.7 GHz - 4M Cache, TDP 58W</li> <li>Intel® Pentium® G5400T 2 Cores 3.1 GHz - 4M Cache, TDP 35W</li> <li>Intel® Celeron® G4900 2 Cores 3.1 GHz - 2M Cache, TDP 54W</li> <li>Intel® Celeron® G4900T 2 Cores 2.9 GHz - 2M Cache, TDP 35W</li> </ul>
Chipset	<ul style="list-style-type: none"> <li>Intel H310 Chipset</li> </ul>
Memory	<ul style="list-style-type: none"> <li>1x DDR4 2666 MHz 260-Pin SO-DIMM Socket, Supports Up to 32 GB ( Un-buffered and non-ECC)</li> </ul>
BIOS	<ul style="list-style-type: none"> <li>AMI BIOS</li> </ul>

### Graphics

Graphics Engine	<ul style="list-style-type: none"> <li>Integrated Intel® UHD Graphics 630: Core™ i7/i5/i3</li> <li>Integrated Intel® UHD Graphics 610: Pentium® /Celeron®</li> </ul>
Maximum Display Output	<ul style="list-style-type: none"> <li>Supports Dual Independent Display</li> </ul>
DP	<ul style="list-style-type: none"> <li>1x DisplayPort Connector (4096 x 2304@60Hz)</li> </ul>
VGA	<ul style="list-style-type: none"> <li>1x VGA Connector (1920 x 1200 @60Hz)</li> </ul>

### Audio

Audio Codec	<ul style="list-style-type: none"> <li>Realtek® ALC888, High Definition Audio</li> </ul>
Line-out	<ul style="list-style-type: none"> <li>1x Line-out, Phone Jack 3.5mm</li> </ul>
Mic-in	<ul style="list-style-type: none"> <li>1x Mic-in, Phone Jack 3.5mm</li> </ul>

### I/O

LAN	<ul style="list-style-type: none"> <li>2x GbE LAN, RJ45</li> <li>- GbE1: Intel® I219</li> <li>- GbE2: Intel® I210</li> </ul>
COM	<ul style="list-style-type: none"> <li>2x RS-232/422/485 with Auto Flow Control (Supports 5V/12V), DB9</li> </ul>
USB	<ul style="list-style-type: none"> <li>3x 5Gbps USB 3.2 Gen1, Type A</li> <li>3x 480Mbps USB 2.0, Type A</li> </ul>

### Storage

SSD/HDD	<ul style="list-style-type: none"> <li>1x 2.5" SATA HDD/SSD Bay (SATA 3.0)</li> </ul>
mSATA	<ul style="list-style-type: none"> <li>2x mSATA Socket (SATA 3.0)</li> </ul>
M.2 SSD	<ul style="list-style-type: none"> <li>1x M.2 Key M 2280 Socket, Supports SATA SSD (SATA 3.0) and NVMe PCIe</li> </ul>
RAID	<ul style="list-style-type: none"> <li>Do not Support RAID Function</li> </ul>

**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 • Cableless Design • Jumper-less Design • Unibody Design

**Reliability & Protection**

Reverse Power Input Protection	<ul style="list-style-type: none"> <li>• Yes</li> </ul>
Over Voltage Protection	<ul style="list-style-type: none"> <li>• Protection Range: 51~58V</li> <li>• Protection Type: shut down operating voltage, re-power on at the preset level to recover</li> </ul>
Over Current Protection	<ul style="list-style-type: none"> <li>• 15A</li> </ul>
Surge Protection	<ul style="list-style-type: none"> <li>• 2 kV</li> </ul>
CMOS Battery Backup	<ul style="list-style-type: none"> <li>• SuperCap Integrated for CMOS Battery Maintenance-free Operation</li> </ul>
MTBF	<ul style="list-style-type: none"> <li>• 458,722 Hours</li> <li>- Database: Telcordia SR-332 Issue3, Method 1, Case 3</li> </ul>

**Operating System**

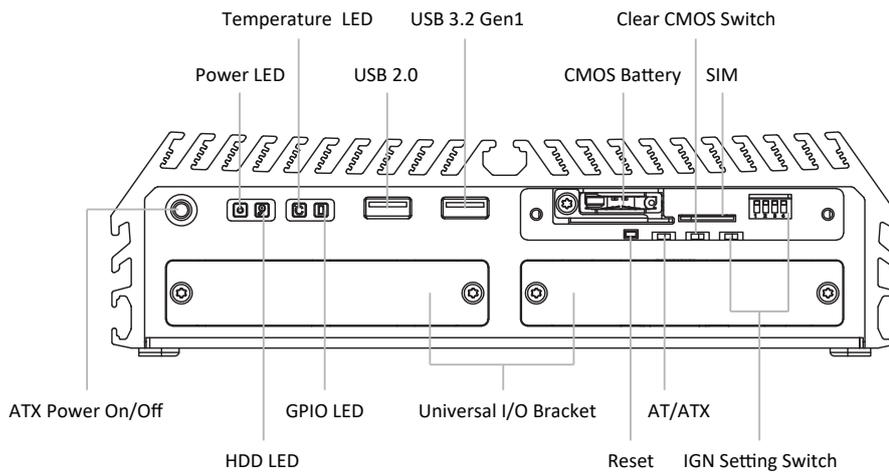
Windows	<ul style="list-style-type: none"> <li>• Windows® 10</li> </ul>
Linux	<ul style="list-style-type: none"> <li>• Supports by project</li> </ul>

**Environment**

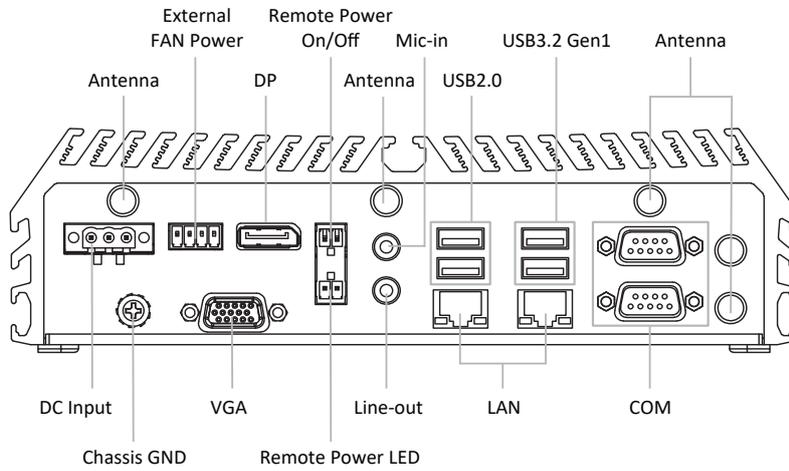
Operating Temperature	<ul style="list-style-type: none"> <li>• 35W TDP Processor: -40°C to 70°C</li> <li>• 65W TDP Processor: -40°C to 60°C (With External Fan Kit)                             <ul style="list-style-type: none"> <li>- With extended temperature peripherals; Ambient with air flow</li> <li>- According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14</li> </ul> </li> </ul>
Storage Temperature	<ul style="list-style-type: none"> <li>• -40°C to 85°C</li> </ul>
Relative Humidity	<ul style="list-style-type: none"> <li>• 95%RH @ 70°C (non-Condensing)</li> </ul>
Shock	<ul style="list-style-type: none"> <li>• MIL-STD-810G</li> </ul>
Vibration	<ul style="list-style-type: none"> <li>• MIL-STD-810G</li> </ul>
EMC	<ul style="list-style-type: none"> <li>• CE, FCC, ICES-003 Class A, EN50121-3-2 (Railway)</li> </ul>
Safety	<ul style="list-style-type: none"> <li>• IEC/EN 62368-1</li> </ul>

External Layout

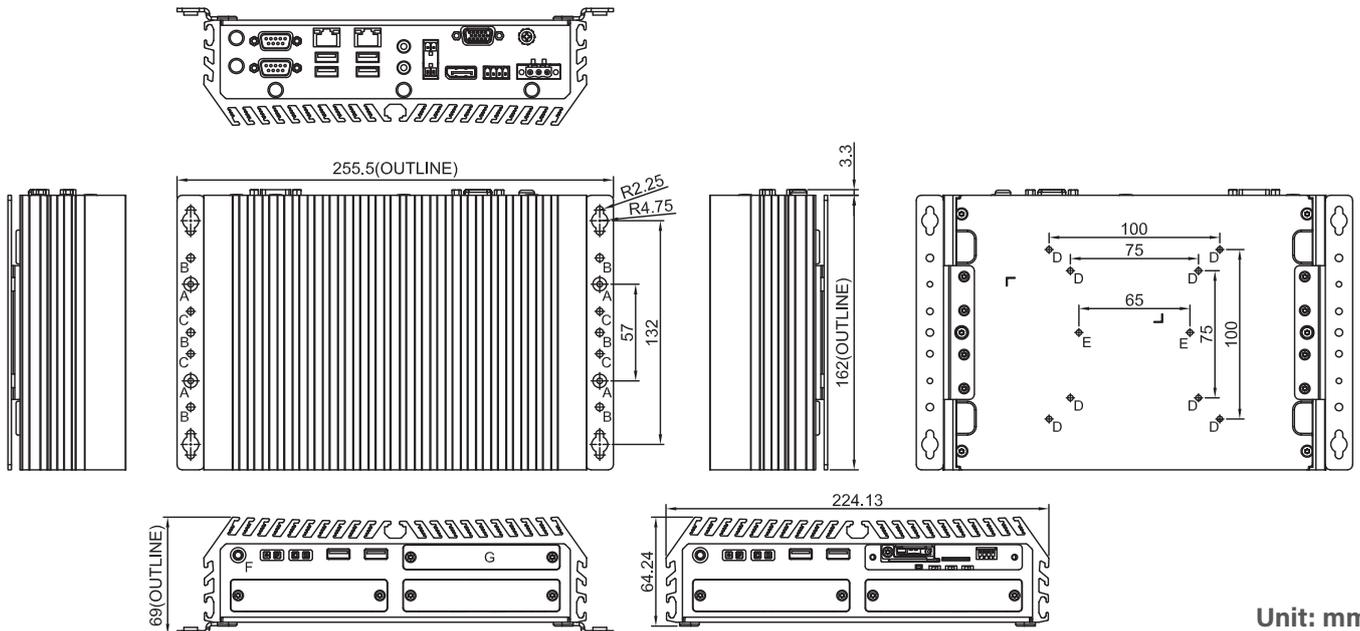
Front



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

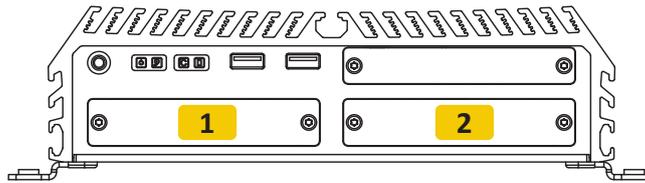
### Package Checklist

• DV-1000 Embedded System x1	• Wall Mounting Kit x1
• CPU Thermal Pad x1	• Power Terminal Block Connector x 1
• Utility DVD Driver x 1	• Remote Function Terminal Block Connector x 2
• Screw Pack x 1	• 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-M102-15	Mini-PCle Module with 2x USB 3.2 Gen1 Ports, 1x 15cm cable
MEC-LAN-M102-15	Mini-PCle 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-R10	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

**Optional Module Configuration**



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

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