# TPC-B620

## Modular TPC - Computing Box Module with Intel® 12th/13th/14th Gen./BTL S Core™ i CPU Socket (LGA1700)


## Features

- High Performance Computing Box powered by Intel® 12th/13th/14th Gen. Core™ i / BTL Core™ S-series CPUs Socket (LGA1700) with fanless design
- 10+ x Panel Modules (IP66) ranging from 15" to 23.8" in selection
- Dual Channel Memory slots (DDR5) support up to 64GB in total
- Comprehensive I/Os, including 4 x USB, 2 x COM, 3 x RJ45...etc
- Supports Expansion via 1 x PCIe x16, 1 x PCIe x4 or PCIe x2, 4 x M.2 (NVMe, SATA, WIFI)
- Supports Storage via 2 x M.2 2280 SATA SSD (RAID 0/1), 1 x M.2 NVMe SSD (2280)
- Supports Fieldbus protocols/GPS/GPRS/Wi-Fi capabilities via iDoor technology
- Supports Diverse system I/O, DIO, PoE...etc. via iDoor technology
- Supports TPM 2.0 hardware security

## Introduction

Advantech's TPC-B620 is a high-performance modular Panel PC designed for Industry 4.0 applications. Powered by Intel® 12th/13th/14th Gen. Core™ i / BTL Core™ S-series processors (LGA1700) and supporting up to 64GB DDR5, it features a fanless design with rich I/O (4 x USB, 3 x 2.5GbE LAN, HDMI, DP), PCIe x16 expansion, and versatile storage options including 3 x M.2 and an optional 2.5" HDD/SSD. When paired with IP66-certified touch displays ranging from 15" to 23.8" FHD, it delivers a scalable, rugged solution ideal for demanding industrial environments. Optional internal speaker available.

## Specifications

### CPU

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Bartlett Lake-S Processors** | CPU | Core7 251E | Core5 221E | Core5 211E | Core3 201E | Core7 251TE | Core5 221TE | Core5 211TE | Core3 201TE |
| | P-core Base Frequency | 2.1 GHz | 2.7 GHz | 2.7 GHz | 3.6 GHz | 1.4 GHz | 1.8 GHz | 1.7 GHz | 2.9 GHz |
| | L3 Cache | 36 MB | 24 MB | 20 MB | 12 MB | 36 MB | 24 MB | 20 MB | 12 MB |
| | Cores | 24 | 14 | 10 | 4 | 24 | 14 | 10 | 4 |
| | Processor Base Power | 65 W | 65 W | 65 W | 60 W | 45 W | 45 W | 45 W | 45 W |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **14th Generation Processors** | CPU | i9-14900 | i7-14700 | i5-14500 | i5-14400 | i5-14400F | i3-14100 | 300 | i9-14900T | i7-14700T | i5-14500T | i5-14400T | i3-14100T | 300T |
| | P-core Base Frequency | 2.0 GHz | 2.1 GHz | 2.6 GHz | 2.5 GHz | 2.5 GHz | 3.5 GHz | 3.9 GHz | 1.1 GHz | 1.3GHz | 1.7 GHz | 1.5 GHz | 2.7 GHz | 3.4 GHz |
| | L3 Cache | 36 MB | 33 MB | 24 MB | 20 MB | 20 MB | 12 MB | 6 MB | 36 MB | 33 MB | 24 MB | 20 MB | 12 MB | 6 MB |
| | Cores | 24 | 20 | 14 | 10 | 10 | 4 | 2 | 24 | 20 | 14 | 10 | 4 | 2 |
| | Processor Base Power | 65 W | 65 W | 65 W | 65 W | 65 W | 60 W | 46 W | 35 W | 35 W | 35 W | 35 W | 35 W | 35 W |

### General

- **BIOS** AMI UEFI
- **Certification** BSMI, CCC, CE, FCC Class A, CB/UL
- **Cooling System** Fanless design
- **Dimensions (W x H x D)** 269 x 224 x 76 (mm)
- **Enclosure** Aluminum housing
- **Mounting** VESA Mount, Desktop, Wall or Panel Mount
- **OS Support** Win10 LTSC,Win11 LTSC, Linux
- **Security** TPM 2.0 (built-in)
- **Power Consumption** Typ. 97 W; Max. 179 W (without Panel Module)
- **Power Input** 24 $V_{DC}$ ± 20%
- **Watchdog Timer** 15-255 sec (system)
- **Weight (Net)** 4.2 kg (9.26 lbs)

### System Hardware

- **CPU** Intel® 12th/13th/14th Gen. Core™ i / BTL Core™ S-series Socket CPU (LGA1700)
- **Memory** Dual channel DDR5 SO-DIMM
  (Each channel supports up to 32G, 4800 MHz)
- **LAN** 3 x 10/100/1000/2500BASE-T (LAN: i226LM)
- **Expansion Slot*** (R680E Option1) 1 x PCIe* x16 + 1 x PCIe* x4
  (R680E Option2) 2 x PCIe* x4
  *Warning: Please order PCIe card expansion kit or fan kit for adding/installing PCIe card(s)
  1 x M.2 E key 2230 (WIFI, PCIe x1/USB 2.0)
- **Storage Slot** 1 x M.2 M key 2280 (SATA or NVMe PCIe x4 for R680E; PCIe x2 for H610E)
  2 x M.2 M key 2280 (SATA)
  (Optional) 1 x 2.5" SSD/ HDD (SATA, Max. 7mm)
- **I/O** 2 x RS-232/422/485
  4 x USB 3.2 (Gen 1)
  1 x Displayport 1.4
  1 x HDMI 1.4a
  1 x Audio line out/Mic in

### Environment

- **Humidity** 95% RH @ 40°C, non-condensing
- **Ingress Protection** IP66 (for optional panel module with "Panel Mount")
- **Operating Temperature** **(Without PCIe cards)**
  35W/45W CPU: -10~55°C (14~131°F) (w/ 0.7 m/s airflow)
  65W CPU: -10~45°C (14~113°F) (w/ 0.7 m/s airflow)
  **(With 35W GPU card)**
  35W/45W CPU: -10~45°C (14~ 113°F) (w/ 0.7 m/s airflow)
  65W CPU: -10~40°C (14~ 104°F) (w/ 0.7 m/s airflow)
- **Storage Temperature** -20~70°C (-4~158°F)
- **Vibration Protection** With SSD: Operating, IEC 60068-2-6, 1G, 5-500 Hz, random vibration
- **Shock Protection** With SSD: Operating, IEC 60068-2-27, half sine, 10G, 11 ms

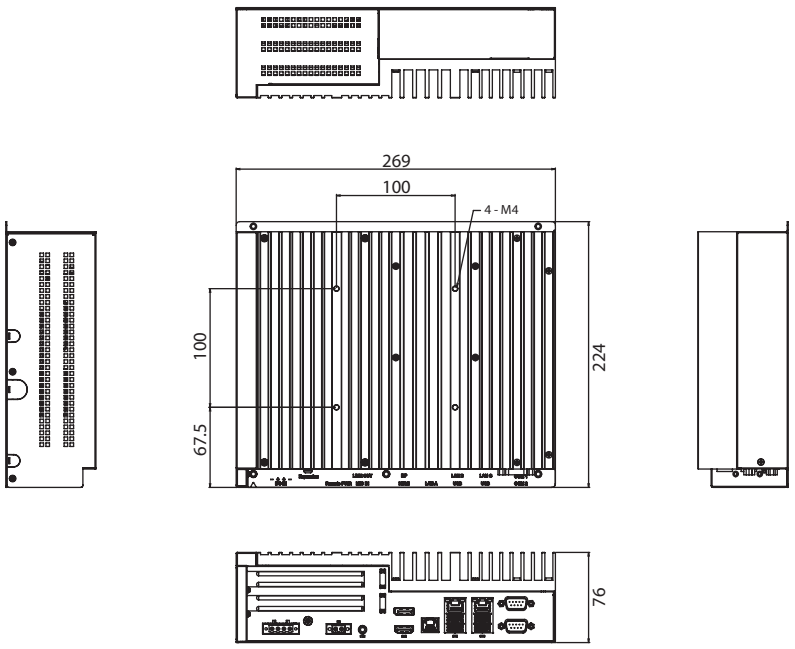
Note 1: IP66 is applicable for Panel Mount.

### Power Consumption with Panel Module

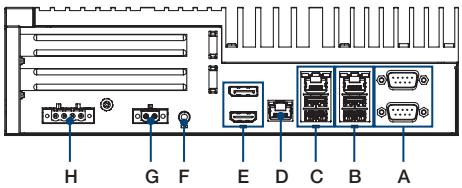
| Item | Power Consumption | | Screen Size | Resolution | Aspect Ratio |
|---|---|---|---|---|---|
| | Type | Max. | | | |
| TPC-B620 (w/ 65W CPU) | 97W | 179W | N/A | N/A | N/A |
| w/ FPM-D15T-CE/RE | 106W | 188W | 15" | 1024x768 | 04:03 |
| w/ FPM-D15T-HE | 121W | 203W | 15" | 1024x768 | |
| w/ FPM-D17T-CE/RE | 113W | 195W | 17" | 1280x1024 | 05:04 |
| w/ FPM-D19T-CE | 111W | 193W | 19" | 1280x1024 | |
| w/ FPM-D15W-FCE | 113W | 195W | 15.6" | 1920x1080 | 16:09 |
| w/ FPM-D15W-FHE | 122W | 204W | 15.6" | 1920x1080 | |
| w/ FPM-D18W-FCE | 111W | 193W | 18.5" | 1920x1080 | |
| w/ FPM-D21W-CE | 110W | 192W | 21.5" | 1920x1080 | |
| w/ FPM-D21W-HE | 139W | 221W | 21.5" | 1920x1080 | |
| w/ FPM-D24W-CE | 121W | 203W | 21.5" | 1920x1080 | |
| w/ FPM-S18W-A | 111W | 193W | 18.5" | 1920x1080 | 16:09 |
| w/ FPM-S21W-A | 110W | 192W | 21.5" | 1920x1080 | |

## Dimensions

Unit: mm




## Rear View




A. COM1,2 (RS-232/422/485)
B. 2.5 GbE LAN / USB 3.2 x2
C. 2.5 GbE LAN / USB 3.2 x2
D. 2.5 GbE LAN
E. 1 x DP / 1 x HDMI
F. Audio line out/Mic in
G. Remote Power Button Connector
H. DC IN Connector

Note 1: The max. dimension of PCIe expansion cards supported is 191 x 111.15 x 34.80 mm.
Note 2: If the two slots are to be used simultaneously, the max. dimension supported is 191 x 111.15 x 14.47 mm for each PCIe expansion card.
Note 3: The max. power consumption of PCIe expansion card supported is 60W.

# Ordering Information

| Part No. | Desription | PCIe Expansion | SATA RAID 0/1 |
|---|---|---|---|
| TPC-B620H-F00A* | Intel® 12th/13th/14th Gen. Core™ i / BTL Core™ S CPU Socket (LGA1700), H610E | Not Support | NA |
| TPC-B620R-F00A* | Intel® 12th/13th/14th Gen. Core™ i / BTL Core™ S CPU Socket (LGA1700), R680E | Need to order optional Module | Yes |

* TPC-B620R-F00A do not include PCIe expansion card by default, customer will need to order GPU or IO card expansion kit.
** TPC-B620R-DIOA1 does not including system fan. With high power consumption PCIe cards (EX: POE), please also order 98R1B620F00.

### Panel Module

| Panel Module P/N | FPM-D15T-CE/RE | FPM-D15T-HE | FPM-D17T-CE/RE | FPM-D19T-CE | FPM-D15W-FCE | FPM-D15W-FHE |
|---|---|---|---|---|---|---|
| Description | 15" XGA TFT LED LCD 300 nits | 15" XGA TFT LED LCD High Brightness 1800 nits | 17" SXGA TFT LED LCD 350 nits | 19" SXGA TFT LED LCD 350 nits | 15.6" FHD TFT LED LCD 450 nits | 15.6" FHD TFT LED LCD High Brightness 1200 nits |

| Panel Module P/N | FPM-D18W-FCE | FPM-D21W-CE | FPM-D21W-HE | FPM-D24W-CE | FPM-S18W-A | FPM-S21W-A |
|---|---|---|---|---|---|---|
| Description | 18.5" HD TFT LED LCD 350 nits | 21.5" FHD TFT LED LCD 250 nits | 21.5" FHD TFT LED LCD High brightness 1400 nits | 23.8" FHD TFT LED LCD 350 nits | 18.5" HD TFT LED LCD, SLIM 350 nits | 21.5" HD TFT LED LCD, SLIM 250 nits |

*For more information about the panel module, please refer to "FPM-Display Module" Data Sheet.

# Packing List

| Item | Part No. | Depiction | Qty |
|---|---|---|---|
| Grounding cable | 1703011001-11 | A Cable G-TEM 4.3 100CM C=GR/Y | 1 |
| Plug-In Block (2 Pin) | 1652002202 | Remote Button, PLUG-IN BLOCK 2P 90D(F) | 1 |
| Plug-In Block (4 Pin) | 1652003234 | DC-IN Connector, PLUG-IN BLOCK 4P | 1 |
| CPU Grease | 1990041069N000 | Thermal pad PTM7958 40.3x30.7x0.21 K=8.5 | 1 |
| PCH Thermal-Pad | 1990022548N000 | Thermal-Pad 11.8x11.8x0.8 K=6 TP Apus-GR-Hm | 1 |
| VR Thermal-Pad | 1990040197N000 | Thermal pad GR-Hm 59x8.0x0.5mm K=6(R-Cut) | 2 |
| NVMI Thermal-Pad | 1990026184N010 | Thermal Pad 59X19.5X0.8 K=6 Apus-GR-Hm Snap w/pa | 1 |
| TOP DDR Thermal-Pad | 1990026184N010 | Thermal Pad 59X19.5X0.8 K=6 Apus-GR-Hm Snap w/pa | 1 |
| BOT DDR Thermal-Pad | 1990039208N010 | Thermal pad 59x22x2 GR-Hm K=6 R-Cut DDR-SODIMM | 1 |
| M.2 for Wifi Thermal-Pad | 1990011911N010 | Thermal pad UTC-515 GR-Hm 20x20x2.5mm K=6 | 1 |
| M.2 SATA Thermal Pad | 1990024800N000 | Thermal-Pad 60x20x1.3 K=6 TP GR-HM HIT-R181 | 2 |
| Warranty | 2190000902 | CARDBOARD-WARRANTY REV. A2 | 1 |
| BOX Fix Screw | 19310305C0 | Screw M3x5L S/S D=5 H=1.2 (2+) ST BZn NK | 5 |
| VESA Screw | 1930005204 | Screw M4x10L R/S DH=6.8x2.50 + ST ZBK PL | 4 |
| China rohs | 202KAKMC00 | China rohs for AKMC model name 1st ed | 1 |

# Optional Accessories

- **TPC-B620R-DIOA1** TPC-B620R PCIe card expansion module for 2x PCIe x4, system fan excluded
- **TPC-B620-DGUA1** TPC-B620R PCIe card expansion module for 1x PCIe x16 + 1x PCIe x4, system fan included
- **98R1B620F00*** TPC-B620 System Fan kit
- **98R1B620S00**** TPC-B620 2.5" SSD Expansion bracket wo SSD
- **96PSA-A230W24P4-3** 230W 24$V_{DC}$ Power Supply
- **1702002600** Power cable (US) 1.8 M
- **1702002605** Power cable (EU) 1.8 M
- **1702031801** Power cable (UK) 1.8 M
- **1700000596-11** Power cable (China/Australia) 1.8 M

*System Fan kit will be request for high power consumption PCIe card. EX: POE cards
**2.5" SSD Expansion kit will occupy upper PCIe card space

# Embedded OS

- **20701WX1HS0025** Win10 IoT Enterprise LTSC 2021 for High
- **20701WLE1S0026** Win11 IoT Ent LTSC 2024 v7.02 B003 for Entry
- **20701WLV1S0025** Win11 IoT Ent LTSC 2024 v7.02 B003 for Value
- **20701WLH1S0022** Win11 IoT Ent LTSC 2024 v7.02 B003 for High
- **20701U22DS0035** Advantech Linux, TPC-B620 Series

# iDoor Modules

- **PCM-24S2WF-BE** 802.11 a/b/g/n/ac 2T2R w/BT4.1, Atheros QCA6174A
- **PCM-24D2R4-BE** Isolated RS-422/485, DB9 x 2, (USB type)
- **PCM-24D2R2-BE** Isolated RS-232, DB9 x 2, (USB type)
- **PCM-24R1TP-BE** 1-Port Gigabit Ethernet, Intel® 82574L, mPCIe, RJ45
- **PCM-27D24DI-AE** Digital I/O, 16 DI / 8 DO, Isolation, DB37 x 1
- **PCM-26D2CA-AE** 2-Port Isolated CANBus mPCIe, CANOpen, DB9
- **PCM-24R2PE-AE** Intel i350, GbE, PoE IEEE 802.3af, PD, RJ45 x 2

*For TPC-B620, "PCM-28P1AD" is needed for iDoor module installation.
**iDoor module occuppies one PCIe expansion slot.
***For more information about iDoor Module, please find "Advantech iDoor Module" on Advantech's official website.

# Application Software

**HMINavi**

HMINavi Designer is a powerful and intuitive software program for creating comprehensive human machine interface solutions. HMINavi Designer is an easily integrated development tool with proven value in many application fields. The features include solution-oriented screen objects, high-end vector graphics, Windows fonts for multi-language applications, receipts, alarm functions, as well as data and operation logging capabilities. HMINavi Designer also supports utility programs such as Data Transfer Helper (DTH), recipe editor, and text editor. The HMINavi Designer software is free download for usage, user can directly download before purchase. With online/offline simulation user can directly connect to PLC controller to ensure solid connection and screen design without any issue. HMINavi Runtime, a component of HMINavi, guarantees the reliability and performance of Open Platform because of the minimum system overhead, high data communication rates, sub-second screen switching, and 24/7 operation. Additionally, Advantech's fast response software team is continually adding new functions, communication drivers, and solutions to the software to meet dynamic needs.

Please note: If some optional modules are offered with the system, additional system certificates may be required in certain regions/countries.
Please contact Advantech for certificate compliance.