

CoreIPC

ITX40D

Mini-ITX Industrial Motherboard Datasheet

Intel® Gemini Lake Platform

|              |                                                      |
|--------------|------------------------------------------------------|
| Document     | Datasheet                                            |
| Model        | ITX40D                                               |
| Issue        | 1.3                                                  |
| Product Type | Mini-ITX Industrial Motherboard                      |
| Website      | <a href="http://www.CoreIPC.com">www.CoreIPC.com</a> |

This datasheet is prepared based on ITX40D User Manual Issue 1.3.

## 1. Product Overview

The ITX40D is a CoreIPC Mini-ITX industrial motherboard supporting Intel® Gemini Lake processors. It integrates DDR4 memory, VGA/HDMI/LVDS or optional eDP display, up to dual Gigabit Ethernet, SATA and mSATA storage, Mini PCIe expansion, multiple USB and serial interfaces, LPT, GPIO, and 12 V DC input for digital signage, communication control, medical instruments, industrial control, financial equipment, cloud terminals, and other embedded applications.

## 2. Key Features

- Integrated Intel® Celeron® J4125 2.0 GHz quad-core processor; compatible with the Intel® Gemini Lake processor family.
- 1 x DDR4 SO-DIMM slot supporting single-channel DDR4-2400 memory up to 16 GB; optional onboard 4 GB or 8 GB LPDDR4.
- VGA or optional DisplayPort, HDMI 1.4, and LVDS or optional eDP display interfaces; triple-display operation is supported depending on configuration.
- Up to 2 x Realtek RTL8111H Gigabit Ethernet ports with Wake-on-LAN and PXE; single-LAN configuration optional.
- Storage includes 1 x SATA 3.0 connector, optional 2.5-inch SATA drive connector, and 1 x full-size mSATA 3.0 slot.
- 1 x Mini PCIe slot for Wi-Fi/4G; optional half-size Mini PCIe or PCIe x1 expansion depending on configuration.
- Supports up to 10 USB ports on single-LAN configurations or 8 USB ports on dual-LAN configurations, including 2 x USB 3.0.
- Provides up to 6 x COM ports. COM1/COM2 support RS485; COM3 supports RS485/RS422; COM4 supports RS485; up to 4 x RS485 is optional.
- LPT, GPIO, amplified audio output, hardware watchdog, CPU/system fan headers, USB wake-up, and AT/ATX power-mode selection.
- Mini-ITX 170 x 170 mm; 12 V DC input; fanless thermal design; operating temperature -20°C to 60°C.

## 3. Technical Specifications

| Category           | Specification                                                                                                                                                  |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor          | Integrated Intel® Celeron® J4125 quad-core processor, 2.0 GHz, TDP 10 W; compatible with the Intel® Gemini Lake processor family.                              |
| Memory             | 1 x SO-DIMM; single-channel DDR4-2400; up to 16 GB (default). Optional onboard 4 GB or 8 GB LPDDR4.                                                            |
| Graphics / Display | Integrated Intel® UHD Graphics 600; 1 x VGA or DP, 1 x HDMI 1.4, and 1 x LVDS or eDP interface. Triple-display operation supported depending on configuration. |
| Ethernet           | Up to 2 x Realtek RTL8111H Gigabit Ethernet controllers; single-LAN option; Wake-on-LAN and PXE support.                                                       |
| Storage            | 1 x SATA 3.0 connector, up to 6 Gbps; optional 2.5-inch SATA drive connector (mutually exclusive with 7-pin SATA); 1 x full-size mSATA 3.0 slot.               |
| Audio              | Realtek ALC897 7.1-channel HD audio; MIC, Line-out, and dual-channel 5 W amplifier output for 2-ohm speakers.                                                  |
| Expansion          | 1 x Mini PCIe slot for half/full-size Wi-Fi or optional 4G; optional half-size Mini PCIe slot or optional PCIe x1 slot, mutually exclusive.                    |
| USB                | 2 x USB 3.0 plus USB 2.0 interfaces. Up to 10 USB ports on single-LAN versions or 8 USB ports on dual-LAN versions.                                            |
| Serial Ports       | Up to 6 x COM ports. COM1/COM2 support RS232/RS485; COM3 supports RS232/RS485/RS422; COM4 supports RS232/RS485; COM5/COM6 support RS232.                       |
| Legacy I/O         | 1 x LPT header.                                                                                                                                                |
| GPIO               | 4-channel GPIO input/output.                                                                                                                                   |
| BIOS               | 64 Mb Flash ROM.                                                                                                                                               |
| Watchdog           | Hardware watchdog timer, 256 levels (0-255 seconds).                                                                                                           |
| OS Support         | Windows 10 / Linux.                                                                                                                                            |
| Power              | 12 V DC input; AT/ATX power-mode selection.                                                                                                                    |
| Dimensions         | 170 mm x 170 mm.                                                                                                                                               |
| Environment        | Operating: -20°C to 60°C; Storage: -20°C to 70°C; Humidity: 5%-95% RH, non-condensing.                                                                         |

## 4. I/O Interface Summary

### 4.1 Rear Panel I/O

| Interface | Description                                                                                        |
|-----------|----------------------------------------------------------------------------------------------------|
| Display   | 1 x HDMI; 1 x VGA in standard configuration.                                                       |
| USB       | 2 x USB 3.0; 2 x USB 2.0 available in single-LAN configuration.                                    |
| LAN       | Up to 2 x RJ45 Gigabit Ethernet ports; LAN2 is mutually exclusive with the rear 2 x USB 2.0 ports. |
| Audio     | 1 x Line-out (green); 1 x MIC input (red).                                                         |
| Power     | 1 x 12 V DC input.                                                                                 |

### 4.2 Internal I/O and Headers

| Interface / Header | Description                                                                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| HDMI               | 1 x optional JHDMI 2 x 8-pin header.                                                                                                                   |
| VGA                | 1 x 1 x 12-pin JVGA header sharing signals with the DB15 VGA port.                                                                                     |
| LVDS / eDP         | 1 x dual-channel 24-bit LVDS header (default) and optional eDP implementation; configuration is mutually exclusive as documented in the source manual. |
| Backlight          | 1 x 6-pin panel backlight connector; selectable 5 V / 12 V.                                                                                            |
| USB 2.0            | 3 x 2 x 5-pin USB 2.0 headers providing up to 6 onboard USB 2.0 ports.                                                                                 |
| Serial             | 2 x standard JCOM headers plus 1 x 2 x 20-pin four-port serial header for COM3-COM6.                                                                   |
| RS485 / RS422      | COM1/COM2 support RS485; COM3 supports optional RS485/RS422; COM4 supports optional RS485.                                                             |
| LPT                | 1 x 2 x 13-pin LPT header.                                                                                                                             |
| Audio              | 1 x front-audio header; 1 x 4-pin amplified speaker output header.                                                                                     |
| Power / Panel      | 1 x 4-pin ATX power connector; 1 x drive-power connector; 1 x front-panel switch/LED header.                                                           |
| Fan / GPIO         | 1 x CPU fan header; 1 x system fan header; 1 x GPIO header.                                                                                            |

## 5. Display Support

ITX40D provides VGA or optional DisplayPort, HDMI 1.4, and LVDS or optional eDP display interfaces. The source manual states simultaneous or independent triple-display output via VGA, HDMI, and LVDS/eDP. LVDS and eDP are mutually exclusive, and the optional eDP implementation also has configuration dependencies described in the source manual.

| Item                | Description                                                                                                           |
|---------------------|-----------------------------------------------------------------------------------------------------------------------|
| Integrated Graphics | Intel® UHD Graphics 600.                                                                                              |
| VGA / DP            | 1 x VGA standard; DisplayPort is an optional configuration.                                                           |
| HDMI                | 1 x HDMI 1.4 output.                                                                                                  |
| LVDS / eDP          | LVDS is default; eDP is optional and has mutually exclusive configuration dependencies in the source manual.          |
| Multi-display       | Supports simultaneous or independent triple-display operation via VGA, HDMI, and LVDS/eDP depending on configuration. |
| Panel Power         | Selectable 3.3 V / 5 V / 12 V panel voltage; selectable 5 V / 12 V backlight power.                                   |

## 6. Serial Port Configuration

| Port / Source       | Default / Optional Function                                                                    |
|---------------------|------------------------------------------------------------------------------------------------|
| COM1                | RS232 default; RS485 selectable by jumper; Pin 9 supports selectable RI / 5 V / 12 V.          |
| COM2                | RS232 default; RS485 selectable by jumper; Pin 9 supports selectable RI / 5 V / 12 V.          |
| COM3                | RS232 default; optional RS485; RS422 supported according to the source pin-definition section. |
| COM4                | RS232 default; optional RS485.                                                                 |
| COM5-COM6           | RS232.                                                                                         |
| Differential Serial | Up to 4 x RS485 is optional depending on production configuration.                             |

## 7. Power, Cooling and Reliability Functions

| Item          | Description                                                                                |
|---------------|--------------------------------------------------------------------------------------------|
| Main Power    | 12 V DC input.                                                                             |
| AT / ATX Mode | AT-ATX1 jumper selects automatic power-on behavior.                                        |
| Cooling       | Fanless thermal design; 1 x 4-pin CPU fan header and 1 x 4-pin system fan header reserved. |
| Watchdog      | Hardware watchdog timer, 256 levels (0-255 seconds).                                       |
| Clear CMOS    | JBAT1 1 x 3-pin Clear CMOS jumper.                                                         |
| LVDS Enable   | LVDS_EN1 jumper enables/disables LVDS.                                                     |
| USB Wake-up   | JUSB_PWR1 jumper supports USB 3.0 power during shutdown and keyboard/mouse wake-up.        |

## 8. Mechanical and Environmental Information

| Item                  | Description                                                      |
|-----------------------|------------------------------------------------------------------|
| Form Factor           | Mini-ITX industrial motherboard.                                 |
| Dimensions            | 170 mm x 170 mm.                                                 |
| Operating Temperature | -20°C to 60°C.                                                   |
| Storage Temperature   | -20°C to 70°C.                                                   |
| Operating Humidity    | 5%-95% RH, non-condensing.                                       |
| Power Input           | 12 V DC.                                                         |
| Cooling               | Fanless-capable design with reserved CPU and system fan headers. |

## 9. Ordering Information

| Model             | Description                                                                                       |
|-------------------|---------------------------------------------------------------------------------------------------|
| ITX40D-L12 VER1.3 | J4125; 4 cores; 2.0 GHz; DDR4; HDMI + VGA + LVDS; 1 LAN; 10 USB; LPT; 2 COM / 1 RS485; 12 V DC.   |
| ITX40D-L16 VER1.3 | J4125; 4 cores; 2.0 GHz; DDR4; HDMI + VGA + LVDS; 1 LAN; 10 USB; LPT; 6 COM / 2 RS485; 12 V DC.   |
| ITX40D-L26 VER1.3 | J4125; 4 cores; 2.0 GHz; DDR4; HDMI + VGA + LVDS; 2 LAN; 8 USB; LPT; 6 COM / 2 RS485; 12 V DC.    |
| Display Options   | Optional DP/eDP configurations; LVDS/eDP and other display resources are configuration-dependent. |
| Expansion Options | Optional half-size Mini PCIe or PCIe x1; optional 4G support requires hardware modification.      |

## 10. Compliance and Documentation Notes

- Certification and compliance information is not specified in the source manual. Contact CoreIPC for project-specific certification or compliance documentation.
- The motherboard block diagram labels the audio codec as ALC888, while the detailed motherboard specification lists ALC897. This datasheet follows the detailed specification and recommends confirming the production BOM before ordering.
- The source manual is Issue 1.3, but the motherboard photo and mechanical I/O drawing are labeled ITX40D-L26 VER1.2A / ITX40D VER1.2A. USB, LAN, display, expansion, and serial-port population also varies by selected model/configuration.

## 11. Contact Information

|            |                                                                 |
|------------|-----------------------------------------------------------------|
| Company    | CoreIPC                                                         |
| Sales Team | CoreIPC Sales Team                                              |
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