# Single Board Computer

***Industrial Motherboard***

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**tKINO-BW**

***Thin Mini-ITX SBC supports 14nm Intel***® ***Pentium®/Celeron***® ***on-board SoC, 9~30V DC input, VGA/LVDS/DP+HDMI, SATA 6Gb/s, dual GbE, USB 3.1 Gen 1 (5Gb/s), HD Audio and RoHS***

2 x DDR3L SO-DIMM mSATA

TPM

**Three Digital Display Interfaces**

3 independent displays under Window® 7 OS and up

RS-232/422/485

LVDS

VGA

HDMI/DP

RS-232

microSD slot

2 x SATA 6Gb/s 1 x PCIe x1

LVDS

Power input

PCIe Mini

# *Specifications*

SoC

Intel® Pentium® N3710 on-board SoC (up to 2.56GHz, quad-core, 2MB cache, TDP=6W) Intel® Celeron® N3160 on-board SoC (up to 2.24GHz, quad-core, 2MB cache, TDP=6W)

DC Power

VGA

USB 3.1 Gen 1

Dual LAN

Audio

Intel® Celeron® N3060 on-board SoC (up to 2.48GHz, dual-core, 2MB cache, TDP=6W) Intel® Celeron® N3010 on-board SoC (up to 2.24GHz, dual-core, 2MB cache, TDP=4W) BIOS

UEFI BIOS

Memory

Two 204-pin 1333/1600 MHz single-channel DDR3L SDRAM unbuffered SO-DIMM slots support up to 8 GB

DDR3L

1.35V

***USB***

USB 3.1

mSATA Expansion Thin Type

PCIe Mini

Display

Triple

Graphics Engine

Intel® HD Graphics Gen 8 Engines with 16 low-power execution units, supporting DX11.1, OpenGL 4.2 and OpenCL1.2

Display Output

Triple independent display

1 x HDMI/DP (up to 3840x2160@30Hz)

Jack

HDMI+DP

1 x 18/24-bit dual-channel LVDS (up to 1920x1200@60Hz) 1 x VGA (up to 1920x1200@60Hz)

tKINO-BW-2019-V10

Ethernet

Dual Realtek RTL8111E PCIe GbE controller External I/O Interface

4 x USB 3.1 Gen 1 (5Gb/s)

Internal I/O Interface

1 x KB/MS (1x6 pin) 2 x SATA 6Gb/s with 5V output

1 x MicroSD card slot 2 x USB 2.0 (2x4 pin, P=2.54) 1 x mSATA (colay SATA2) 4 x RS-232 (2x5 pin, P=2.0)

2 x RS-232/422/485 (2x5 pin, P=2.0)

Front Panel

1. x Front panel (2x7 pin, power LED, HDD LED, speaker, power button, reset button) LAN LED
2. x LAN LED (1x2 pin)

SMBus

1 x SMBus (1x4 pin) TPM

1 x TPM (2x10 pin)

I²C

1 x I²C (1x4 pin) Digital I/O

8-bit digital I/O (2x5 pin)

Expansion 1 x PCIe x1

1 x Full-size PCIe Mini card slot Audio

Realtek ALC662 HD codec

1 x Audio jacks (line-out) on rear IO 1 x Front audio (2x5 pin)

Watchdog Timer: Software programmable supports 1~255 sec. system reset Power Supply

1 x External DC power jack (ø5.5 mm)

1 x Internal power connector (2x2 pin) Input Voltage Range: 9V ~ 30V Support AT/ATX mode

Fan Connector

1 x CPU smart fan (1x4 pin)

1 x System smart fan (1x4 pin) Power Consumption

12V@1.61A (Intel® Celeron® N3710 CPU with two 4 GB 1600 MHz DDR3L memory)

Operating Temperature: -20°C ~ 60°C Storage Temperature: -30°C ~ 70°C

Operating Humidity: 5% ~ 95%, non-condensing Weight: GW: 900g / NW: 400g

CE/FCC compliant

# *Features*

* Thin Mini-ITX form factor with 14nm Intel® Pentium®/Celeron® on-board SoC processor supports DDR3L memory
* Supports USB 3.1 Gen 1 (5Gb/s), two SATA 6Gb/s
* Triple independent display, supporting 4K resolution
* Supports IEI jumperless function

# *Packing List*

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| --- |
| 1 x tKINO-BW single board computer with heatsink |
| 1 x I/O shielding |
| 1 x SATA cable |
| 1 x QIG |

***Ordering Information***

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| --- | --- |
| Part No. | Description |
| tKINO-BW-N4-R20 | Thin Mini-ITX SBC supports Intel® Pentium® quad-core processor N3710 up to 2.56GHz (6W), VGA/LVDS/DP+HDMI, SATA, dual GbE, USB 3.1 Gen 1 (5Gb/s), HD Audio and RoHS |
| tKINO-BW-N3-R20 | Thin Mini-ITX SBC supports Intel® Celeron® quad-core processor N3160 up to 2.24GHz (6W), VGA/LVDS/DP+HDMI, SATA, dual GbE, USB 3.1 Gen 1 (5Gb/s), HD Audio and RoHS |
| tKINO-BW-N2-R20 | Thin Mini-ITX SBC supports Intel® Celeron® dual-core processor N3060 up to 2.48GHz (6W), VGA/LVDS/DP+HDMI, SATA, dual GbE, USB 3.1 Gen 1 (5Gb/s), HD Audio and RoHS |
| tKINO-BW-N1-R20\*\* | Thin Mini-ITX SBC supports Intel® Celeron® dual-core processor N3010 up to 2.24GHz (4W), VGA/LVDS/DP+HDMI, SATA, dual GbE, USB 3.1 Gen 1 (5Gb/s), HD Audio and RoHS |
| 32205-002700-200-RS | RS-232/422/485 cable, 200mm, P=2.0 |
| TPM-IN01-R20 | 20-pin Infineon TPM module, software management tool, firmware v3.17 |

\*\*By order production, MOQ: 100