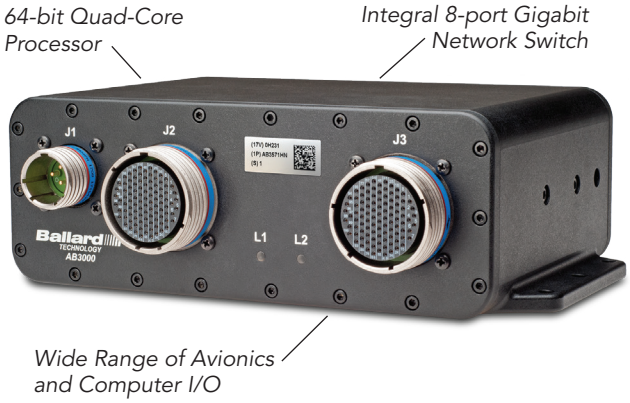
AB3000 Series N

Rugged Networked Avionics I/O Computers



The AB3000 'Series N' from Astronics Ballard Technology is a highly-flexible, COTS solution ideally suited for a distributed system architecture on civil and military platforms. This compact device merges 64-bit Quad Core processing, high-throughput Gigabit Ethernet, and a wide array of conventional avionics I/O into a powerful control and communication solution that provides rapid deployment with no up-front NRE.

Avionics I/O Powerhouse

The AB3000 Series N is optimized to interface with, collect, process, and distribute avionics data. The unit can serve as the main infrastructure component for a distributed system architecture (mission system), or be employed for a variety of interfacing, bridging or control operations. I/O options include MIL-STD-1553 and ARINC databus protocols, serial, discrete, USB and Ethernet. The integral, 8-port Gigabit Ethernet switch reliably moves large amounts of data to where it is needed.

Rugged and SWaP-C Optimized

The AB3000 Series N tightly integrates all of this functionality into a small, lightweight SWaP-C optimized (Size, Weight, and Power plus Cost) enclosure that meets military requirements for shock, vibration, temperature, humidity and pressure. It is small and light enough for use in UAVs and capable enough to handle complex, large-scale aircraft systems.

Versatile Operation

Software can operate the AB3000 in either an embedded or tethered capacity. Embedded programs are typically developed on a host computer and then uploaded to the AB3000's non-volatile Flash memory. At power-on the embedded application boots from the Flash memory and runs without host intervention. In tethered operation, a separate computer runs the application and controls the AB3000 over Ethernet.

Robust Software Capabilities

The included Software Development Kit (SDK) provides tools and examples to facilitate the development of software applications. The AB3000 Series N uses Ballard's universal BTIDriver™ API, so application software for this device is easily ported to or from other Ballard products. Although the unit can be configured and run with only a few API calls, the comprehensive library includes a broad range of functions for specialized needs.

KEY FEATURES

- Key component of an aircraft distributed system architecture
- QorIQ® 64-Bit Quad Core Processor
- Integral 8-port Gigabit Ethernet Switch
- Flexible write protect capability
- Wide range of avionics and computer I/O:
  - MIL-STD-1553
  - ARINC 429, 717
  - Serial, Discrete
  - Ethernet, USB 2.0 Host
- Suitable for fixed wing, UAV, rotorcraft, and ground vehicles
- Low SWaP (Size, Weight, Power)
- Highly reliable, prevalidated COTS solution

Avionics Interfaces

MIL-STD-1553

Up to 4 dual-redundant channels
BC/RT/MON (Single- or Multi-Function)
Hardware controlled transmit scheduling
CH/TA/SA filtering
Sequential monitor

ARINC 429

Up to 12 channels
Periodic and asynchronous messages
Hardware controlled transmit scheduling
Receive message filtering (Label/SDI)
Sequential monitor

ARINC 717

Up to 2 channels
Biphase/Bipolar
Transmit and receive
Sub-frame and super-frame support
64,128,256,512,1024,2048,4096,8192wps
Sequential monitor

RS-232/422

2 ports
Selectable baud rates
Optional handshake signals (232 mode)
Ethernet (TCP) serial server mode

Ethernet Host

2 ports
Auto-sensing 10/100/1000 Mb/s
TCP/IP, UDP

Ethernet Switch

8 ports
Auto-sensing 10/100/1000 Mb/s

USB 2.0 Host

2 ports
High-speed (480 Mb/s)
Mass storage devices

Avionics Discrete I/O

Up to 48 programmable Input/Output
Outputs: Open/GND configuration
Inputs: Open/GND, 28V/Open

Specifications

The AB3000 Series N is available in a large number of configurations that all share the Standard Features below:

Standard Features

- NXP QorIQ T1040 64-bit 1.2 GHz Quad Core Processor
- 2 GB of DDR3L-1600 SDRAM
- 8 GB solid-state storage
- Real Time Clock (back-up hours: 360 minimum, 840 typical)
- 2 Ethernet host ports (10/100/1000)
- 8-Port Ethernet switch (10/100/1000)
- 2 RS-232/422 (selectable)
- 2 USB 2.0 host ports
- System discrete I/O
  - 2 write-protect inputs
  - 1 sanitization-enable input
  - 1 system reset
  - 3 physical address inputs
- Temperature monitoring
- Power: 28 VDC nominal
- MTBF: TBD

Time-Tag/IRIG

48-bit hardware time-tag (1µs resolution)
IRIG A or B, AM (input), PWM, and PPS
- Generate or synchronize
- Synchronize hardware time-tags

Environmental

Storage temperature: -55 to 100°C
Operating temperature: -40 to 55°C
Conduction or convection cooled
DO-160, MIL-STD-810, MIL-STD-461
(Contact factory for environmental test data)

Mechanical

Compact enclosure: 5.3 x 7.7 x 2.8 in (135 x 195 x 71 mm), mounting flanges extend 0.6 in (15 mm) on each side
Weight (typical): 5.2 lb (2.4 kg)
Horizontal and vertical chassis options (CAD installation drawings available)

Connectors

Databus I/O: D38999 (100-pin)
Computer Interfaces I/O: D38999 (100-pin)
Power: D38999 (4-pin)

Software

Embedded Linux OS and SDK (uses Yocto toolchain targeting Linux 4.1 LTSI)
Universal BTIDriver API compatible

AB3000 Series N Models

Many COTS configurations are available. Contact factory for ordering info, accessories, and custom needs.

Example configurations:

- **Model AB3186xN** – Standard features plus 2 dual-redundant multi-function MIL-STD-1553, 8R/4T ARINC 429, 1R/1T ARINC 717 channels
- **Model AB3180xN** – Std features plus 2 dual-redundant multi-function MIL-STD-1553 channels
- **Model AB3146xN** – Standard features plus 8R/4T ARINC 429 and 1R/1T ARINC 717 channels
- **Model AB3581xN** – Standard features plus 4R/4T ARINC 429, 4 dual-redundant multi-function MIL-STD-1553 channels, and 20 avionics discretes

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