

## Ballard NG3 Series

### Rugged, High-Density Avionics I/O Computers

The Ballard NG3 Series from Astronics is the next generation of flexible COTS avionics I/O computers. These compact systems combine Intel 64-bit quad core processing with an exceptional density and variety of avionics and computer I/O. The NG3 has the power and versatility to solve control and communication challenges, and is prevalidated for rapid deployment with no up-front NRE.



**Ballard** |||||

#### Compact and Powerful

The rugged NG3 tightly integrates 64-bit processing and an extensive amount of I/O into a small, light-weight SWaP-optimized (Size, Weight, and Power) 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. It is ideal for deployment in C4ISR applications.

#### Modular I/O Flexibility

The NG3 design incorporates multiple rugged and densely packed I/O modules. These provide great flexibility when ordering to compile the exact I/O required for your specific application. Options include MIL-STD-1553 and ARINC databus protocols, serial, discrete, USB and a managed Ethernet switch. The unit also includes 2D/3D video, audio, and a accessible mPCIe slot that provides additional user-expandable I/O capabilities.

#### Cybersecurity Capabilities

The NG3 includes broad cybersecurity features to facilitate building your unique and effective security solution. These include security features resident in the operating system, discrete inputs for write protection of base non-volatile memory and removable mass storage, processor security TPM, and a sanitize discrete input to wipe all mSATA storage that is not write-protected.

#### Robust Software Capabilities

The included Software Development Kit (SDK) provides tools and examples to facilitate the development of software applications. The NG3 uses the universal Ballard 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

- High I/O density
- Up to 2 removable mSATA SSD
- Flexible write protect capability
- Intel® Atom™ E3950 64-bit, quad core processor
- Low SWaP (Size, Weight, Power)
- Wide range of avionics and computer I/O:
  - MIL-STD-1553
  - ARINC 429, 708, 717
  - Serial, CANBus, Discrete
  - Ethernet, USB 2.0 Host
  - 2D/3D Video, Audio
  - mPCIe expansion option
- Helicopter, fixed wing, UAV, and ground mobile
- Highly reliable, prevalidated COTS solution
- Reduces project risk, time, and cost

## Avionics/Computer I/O\*

### MIL-STD-1553

Up to 12 dual-redundant channels  
BC/RT/MON (Single- or Multi-Function)  
Hardware controlled transmit scheduling  
CH/TA/SA filtering  
Sequential monitor

### ARINC 429

Up to 24 channels (24R12T)  
Periodic and asynchronous messages  
Hardware controlled transmit scheduling  
Receive message filtering (Label/SDI)  
Sequential monitor

### ARINC 708

Up to 6 channels (6R6T)  
Hardware controlled transmit scheduling  
Receive message filtering  
Sequential monitor

### ARINC 717

Up to 3 channels (3R3T)  
Biphase/Bipolar  
Transmit and receive  
Sub-frame and super-frame support  
64,128,256,512,1024,2048,4096,8192wps  
Sequential monitor

### RS-232/422/485

Up to 12 ports  
Selectable baud rates  
Optional handshake signals (232 mode)  
Ethernet (TCP) serial server mode

### Ethernet Switch

Up to 16 ports (10/100 Mb/s)  
Up to 11 ports (10/100/1000 Mb/s)  
Auto-sensing  
Layer 2 managed operation

### Avionics Discrete I/O

Up to 112 programmable Input/  
Output  
Open/GND configuration

### Other I/O (mPCIe Expansion)

- Analog In/Out
- CAN FD, 2 Channels
- USB, 2 Ports

### I/O Options

- 1553 Disable Transmit All

## Specifications

The NG3 Series is available in a large number of configurations that all share the Standard Features below:

### Standard Features

- Intel Atom E3950 64-bit 1.6 GHz (2.0 GHz burst) Quad Core Processor
- 8 GB of DDR3 SDRAM
- Real Time Clock: average of 360 hours at room temperature (25°C)
- Video Out: DVI; max 1920x1080 (WS) or 1280x1024 (SVGA) @ 60 Hz Intel Gen 9-LP 2D/3D graphics engine
- Audio In: 2 mic pre-amps with 8-96kHz sampling; Audio Out: 2 headphones, 50 mW into 16 ohm
- 2 Ethernet host ports (10/100/1000)
- 1 RS-232 console port
- 1 CAN bus 2.0 (ARINC 825 PHY)
- 2 high-speed USB 2.0 host ports
- System discrete I/O
  - 3 write-protect inputs\*\*
  - 1 sanitization-enable input
  - 1 system reset
  - PWR disable
  - PWR button
- Temperature monitoring
- Power: 28 VDC nominal (isolated)

### 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

### 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): 4.4 lb (2.0 kg)  
Horizontal and vertical chassis options

### Connectors

J2 & J3 (I/O): D38999 (100-pin)  
J1 (Power): D38999 (4-pin)

## Expansion

The NG3 Series includes expansion capability for SSD and I/O beneath a maintenance-removable top cover.

- 2 mSATA slots; SSD options: 64GB, 256GB, 1TB MLC\*\*\*
- 1 mPCIe slot

## Software

Universal BTIDriver API compatible  
Optional Software:
 

- Rocky 9 Linux®, 64-bit
- Microsoft® Windows® 10, 64-bit

## NG3 Series Models

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



Horizontal Chassis

Vertical Chassis

\* Maximum I/O values shown per type, values are reduced when ordering more than one type.

\*\* Write protect not available when using Windows OS.

\*\*\* Formatted drive size is less than physical drive size, consult the user manual for more information.

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