cti
a PARSONS Company

IronClad
UxS CONTROLLERS

IronClad: Cybersecure UxS Controllers

IronClad is a low SWaP-C, cybersecure, platform-agnostic, UxS controller that can be easily upgraded or modified to support a variety of missions. Developed in collaboration with the Department of Defense and the Department of Homeland Security, the IronClad controller is American-Made, making it an ideal solution for OEMs searching for a vetted capability applicable to multi-rotor, fixed-wing and hybrid UAS, as well as ground and maritime robots.

American-Designed, -Made, & -Vetted

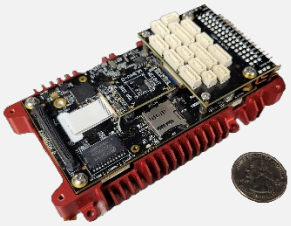
IronClad was developed in collaboration with the US Department of Defense and the US Department of Homeland Security – making it a highly-vetted capability. The IronClad UxS controller is designed and made by American engineers at CTI's facility in Dublin, Ohio.

Platform Agnostic & Modular

IronClad UxS controllers are suitable for Multi-Rotor UAS, Fixed-Wing UAS, Hybrid UAS, Ground Robots, and Maritime Robots. Its modular design allows for simple base configuration or platform-specific expansion boards.

Robust Embedded Hardware

IronClad includes robust CPUs/GPUs allowing for advanced autonomy features, video processing/conversion, and a variety of other applications requiring onboard computing modules.



SPECIFICATIONS

Origin
United States of America
NDAA 2020 Section 848 Compliant

Platforms
Multi-Rotor UAS
Fixed-Wing UAS
Hybrid UAS
Ground Robots
Maritime Robots

Software
Advanced, Open-Source + Security Enhancements

Security
High Assurance Boot
Encrypted File System
- Data at Rest

Onboard AES-256 Encryption
- C2/Telemetry Data

Auto-Wipe Encryption Keys
- Tamper Events
- Lost Vehicle
- Crashed Vehicle

Embedded Hardware
Robust CPUs/GPUs

Integrations
Android Tactical Assault Kit (ATAK)

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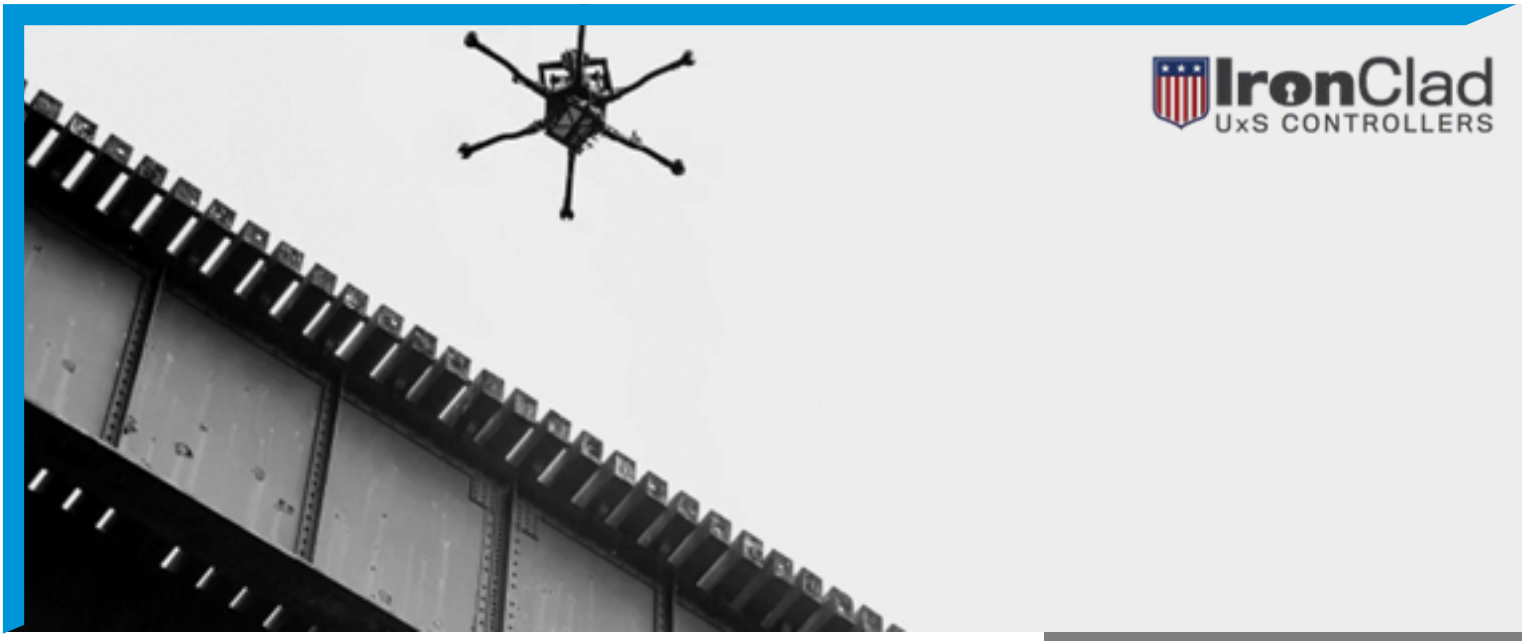

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IRONCLAD BENEFITS

Security: Embedded hardware and firmware security. “Security Umbrella” for payloads and applications. Vetted by DoD and DHS. Passed multiple DoD and 3rd-Party security assessments.

Extra Computing directly on the Board: Edge-computer capability for combined flight control, video processing, and AI/ML applications.

Service Life Extension: Extend the service life and upgrade the capabilities of older UAS through retrofitting.

Common Interface for Mixed UAS Fleets: Reduces training time and reduces the quantity and variety of ground control equipment necessary on-site.

Reduce Number of Operators Required: For complex tracking and targeting tasks.

Open-Source Autopilot Software: Autopilot software is vetted and allows for tailored packages. Software is informed by academic and industry research. Can be considered Government-Off-The-Shelf (GOTS) system.

Modular Design: Additional processor types and digital I/Os can easily be added to IronClad via expansion ports.

Integrated HWIL Simulation Capability: Hardware-In-The-Loop Simulation capability allows for risk-reduced flight control refinement and payload development testing.

WHERE CAN IRONCLAD BE USED?

Service Life Extension: Retrofit kits are available for fielded DoD sUAS.

Program of Record: Common ground control station interfaces, flight controls, mission planning, cybersecurity Authority to Operate (ATO), training, and logistics.

R&D Contracts: Fault- and Damage-tolerant flight controls, onboard collision avoidance autonomy packages, and capabilities to enable autonomous flights in urban and other severe geographic environments.

OEM Integration: Upgrade from Pixhawk hardware while using the same codebase.

IRONCLAD BASE CONFIGURATION

Size:
Dimensions – 4.4” x 2.2” x 1.0”
Weight – 75g (Enclosed Kit – 150g)

FMU Computer Specs:
Main Cores
- 4 x Arm Cortex-A53 @ 1.6Ghz
- 1 x Arm Cortex-M7 @ 800 Mhz

Neural Processing Unit
- Up to 2.3 TOPS

Graphics Processing Unit
- 16GFLOPS (high precision) OpenGL® ES 3.1/3.0, Vulkan®, OpenCL™ 1.2 FP, OpenVG™ 1.1

Video Processing Unit
- Hardware Video Encoding

Cryptographic Acceleration & Assurance
True Random # Generator
- Symmetric – AES-128/192/256
- Asymmetric – RSA (up to 4096), Elliptic Curve (up to 1023)

Onboard Sensors:
3 x IMUs, Temp-Controlled, 9DOF
2 x Barometer

Environmental:
-40°C to 85°C

Electrical:
Input Voltage – 4-40V DC

Expansion:
Gigabit Ethernet RGMII
MIPI-CSI2 4-lane (x2)
HDMI Output
USB 2.0 & USB 3.0
PCI 2.0 1-Lane

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Retrofit Kit for

AE RQ-20 A/B

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