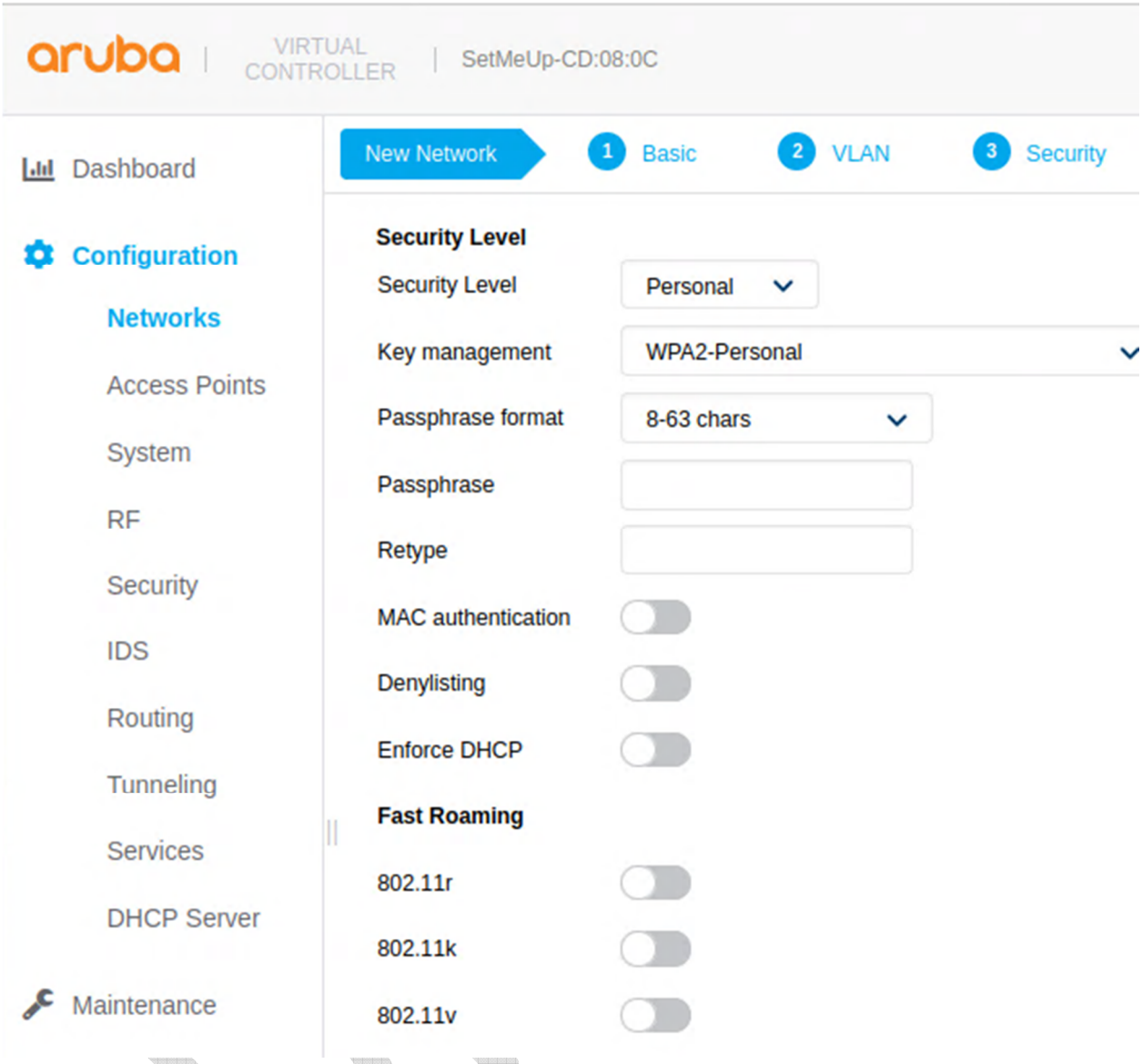

Figure 16: Personal Security level options

Finally, selecting the Enterprise level allows you to configure an external RADIUS authentication server, as shown below in Figure 17.

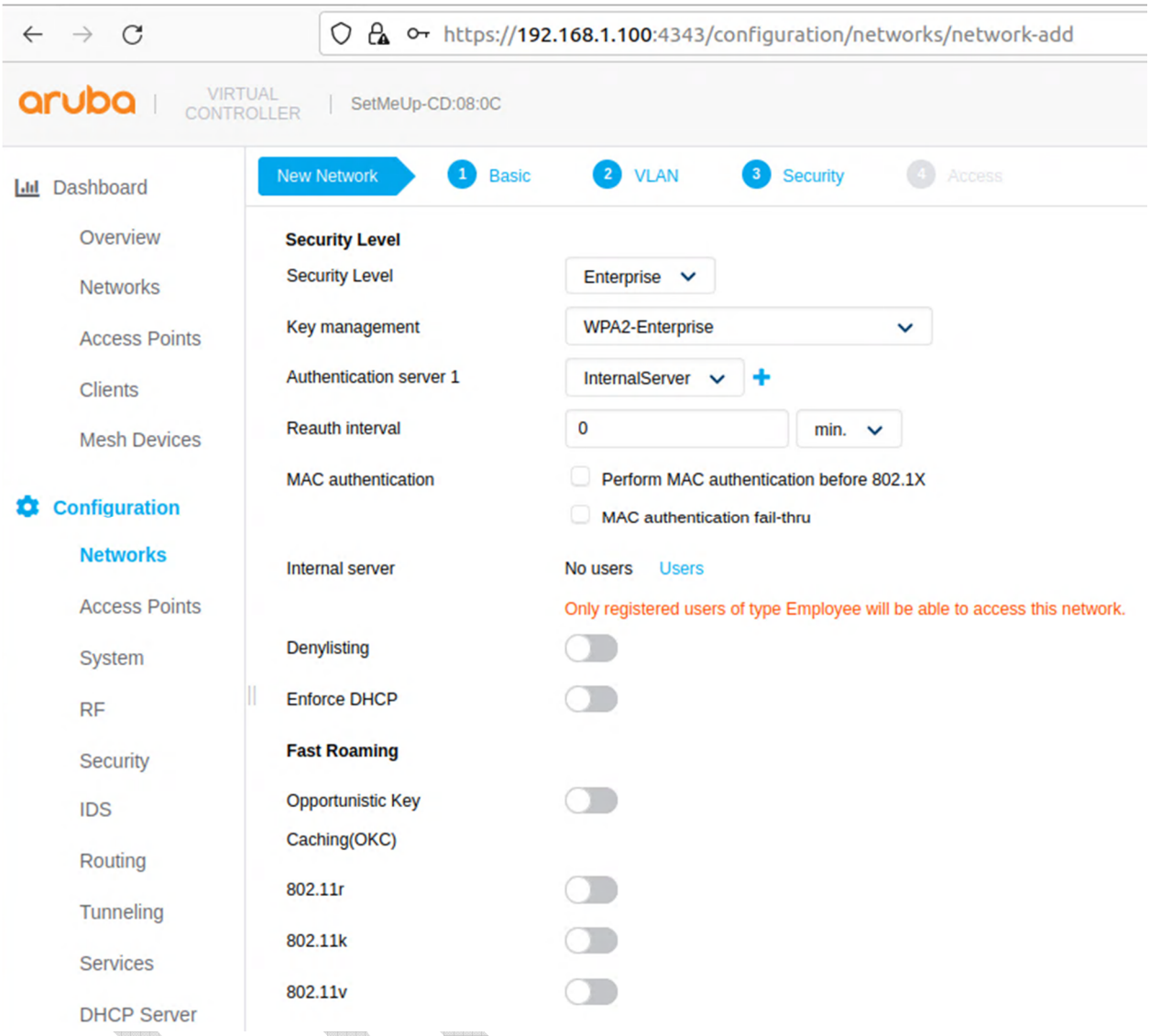

Figure 17: Enterprise Security level options

Step 4

The Access tab is where you configure the firewall rules and user rights. As shown in Figure 18, the Access tab allows you to create Network-Based rules and Role-Based rules. You also have the option to leave the SSID Unrestricted.

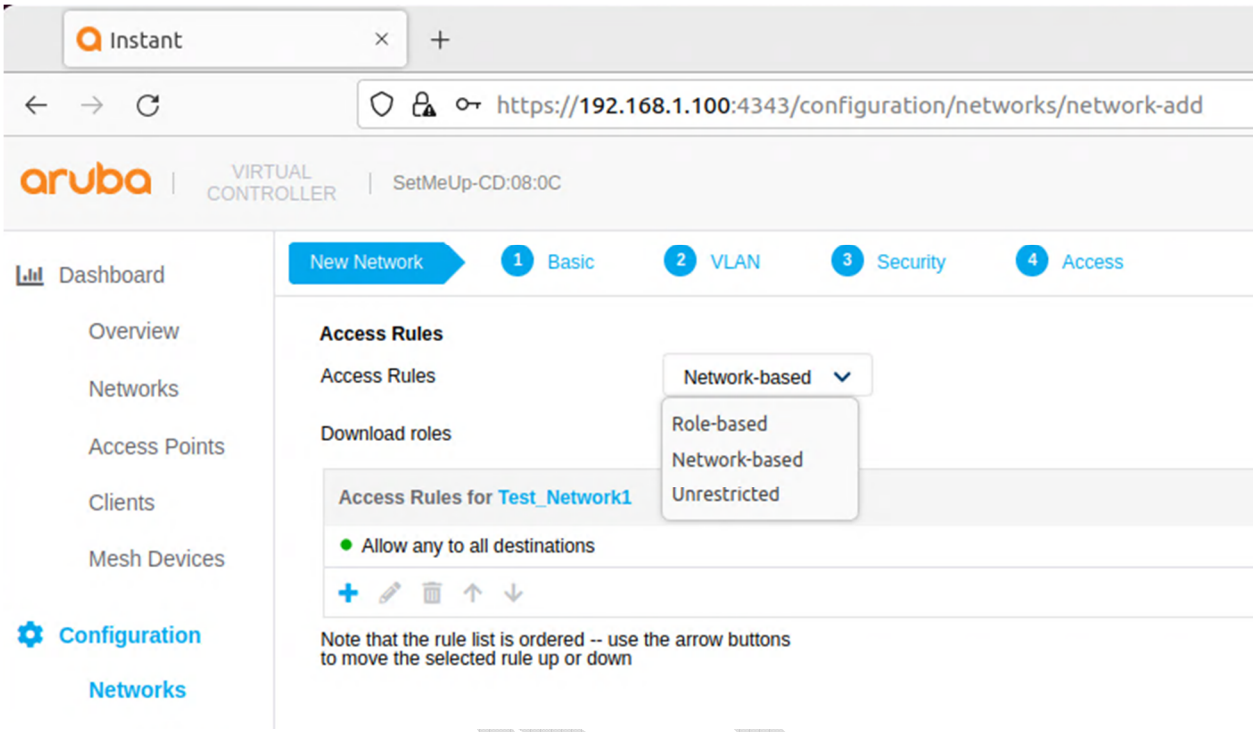

Figure 18: Access Rules options

Figure 19 shows an example of creating a rule that denies all DNS traffic except to the DNS server with the IP address of 192.168.10.1.

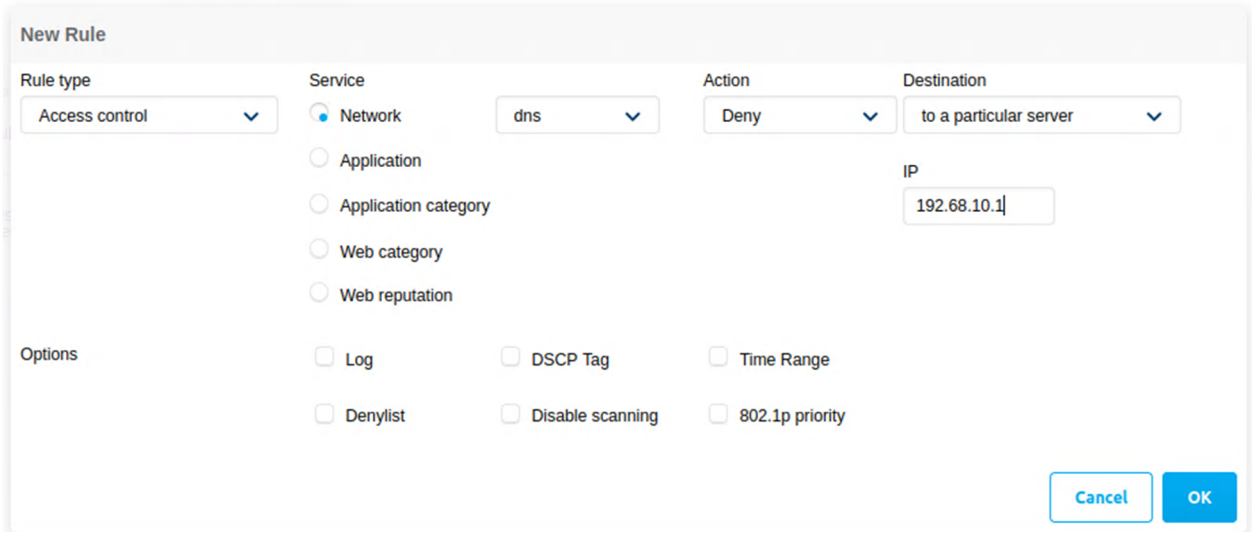

Figure 19: Configuring Firewall Rules

Refer to the *Aruba Instant Users Guide* for additional information on the Virtual Controller GUI.

5 Physical I/O

5.1 Connections and Cabling

Table 6 lists the CWAP's external connector interfaces (per ARINC 628).

Table 6: CWAP External Connector Interfaces

Ref Des.	Shell	Insert	Mating Shell	Mating Insert
J1	EN4165M01AA	EN4165A20-22-1NA	EN4165M61AA	EN4165A20-22-1NB
J2	EN4165M01AB	EN4165A20-22-1NB	EN4165M61AB	EN4165A20-22-1NA
J3	EN4165M01AC	EN4165A20-22-1NA	EN4165M61AC	EN4165A20-22-1NB

5.1.1 Connector Definition J1

The J1 connector carries the input power, connects the CWAP to the upstream server/network, and carries both the Power Enable and RF Enable discrete signals to the unit.

Figure 20 shows connector layout and pin definitions for the CWAP's J1 external aircraft connection.

Figure 20: J1 (Pins) Connector Layout and Pin Definitions

5.1.2 Connector Definition J2

The J2 connector passes power, Ethernet and both the Power Enable, and RF Enable discrete signals to the next downstream CWAP when the units are in a Daisy Chain configuration.

Figure 21 shows connector layout and pin definitions for the CWAP's J2 external aircraft connection.

Figure 21: J2 (Socket) Connector Layout and Pin Definitions

5.1.3 Connector Definition J3

The J3 carries the discrete IP strapping signals from the aircraft to the CWAP. Figure 22 shows connector layout and pin definitions for the CWAP's J3 external aircraft connection. Please see Table 5 for IP Address information.

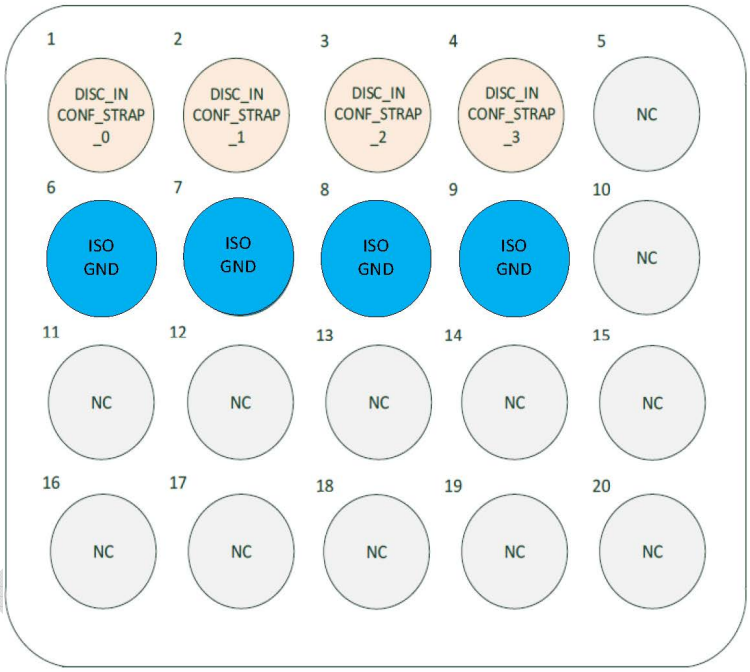

Figure 22: J3 (Socket) Connector Layout and Pin Definitions

5.2 Maintenance Connectors

Two maintenance connectors are located on the front of the unit behind the maintenance door.

- The J10 connector is a female micro USB that provides a serial interface to both the SIB and the AP.
- A four pin SIB programming header is located below the J10 connector. This programming header provides an interface for programming the SIB bootloader.

Reset button

The reset button is located behind the maintenance door. Holding the reset button for 5 seconds, until the power LED rapidly blinks, will factory reset the Aruba AP.

5.3 Status Indicators

The CWAP has four (4) AP status LEDs, and three (3) CWAP indicators that are visible on the top (radome) of the CWAP and are to be used to indicate the AP status and activity. The meanings of these indicators are defined in Table 7 below.

Table 7: AP LED Operation

Indicator	Color/State	Meaning
AP Status LED	OFF	AP Powered OFF.
	Green - Solid	AP ready, fully functional, no network restrictions.
	Green - Blinking note 1	AP booting, not ready.
	Green - Flashing Off note 2	Device ready, fully functional, either uplink negotiated in sub-optimal speed (<1Gbps).
	Green - Flashing On note 3	Device in deep-sleep mode.
	Amber - Solid	Device ready, restricted power mode, no network restrictions.
	Amber - Flashing Off	Device ready, restricted power mode, uplink negotiated in sub-optimal speed.
	Red - Solid	System error condition.
AP Radio Status (One each for 2.4GHz, 5GHz, 6GHz radios)	OFF	Device is powered OFF, or radios disabled.
	Green - Solid	Radios enabled in access mode.
	Green - Flashing Off	One radio enabled in uplink or mesh mode.
	Amber - Solid	Radios enabled in monitor mode or spectrum analysis mode.
CWAP Power	Green - Solid Red - Solid	AC is present – No fault detected. AC power present – Fault detected.
Ethernet Link (LAN 1, LAN 2)	Green - Blinking	Indicates link activity for LAN 1 (J1 connector) and LAN 2 (J2 connector).

Notes:

1. Blinking: one second on, one second off, 2-seconds cycle
2. Flashing off: mostly on, fraction of a second off, 2-second cycle
3. Flashing on: mostly off, fraction of a second on, 2-seconds cycle

6 Performance Data

6.1 Radio Characteristics

Table 8: Radio Characteristics

Feature	Description
Supported Frequency Bands country-specific restrictions apply	-2.400 to 2.4835 GHz ISM -5.150 to 5.250 GHz U-NII-1 -5.250 to 5.350 GHz U-NII-2 -5.470 to 5.725 GHz U-NII-2E -5.725 to 5.850 GHz U-NII-3/ISM * -5.850 to 5.895 GHz U-NII-4 -5.925 to 6.425 GHz U-NII-5 -6.425 to 6.525 GHz U-NII-6 -6.525 to 6.875 GHz U-NII-7 -6.875 to 7.125 GHz U-NII-8
Operating Channels	Dependent on configured regulatory domain.
Supported radio technologies	-802.11b: Direct-sequence spread-spectrum (DSSS) -802.11a/g/n/ac: Orthogonal frequency-division multiplexing (OFDM) -802.11ax: Orthogonal frequency-division multiple access (OFDMA)
Supported Modulation Types	-802.11b: BPSK, QPSK, CCK -802.11a/g/n/ac: BPSK, QPSK, 16-QAM, 64-QAM,256-QAM -802.11ax: BPSK, QPSK, 16-QAM, 64-QAM,256-QAM, 1024-QAM, 4096-QAM -802.11n high-throughput (HT) support: HT20/40 -802.11ac very high throughput (VHT) support VHT20/40/80 -802.11ax high efficiency (HE) support HE20/40/80/160
Transmit Power Adjustment	Software configurable in increments of 0.5 dBm.
Maximum Available Transmit Power**	Maximum (aggregate, conducted total) transmit power (limited by local regulatory requirements): -2.4GHz band: +21 dBm (18 dBm per chain) -5 GHz band: +21 dBm (18 dBm per chain) -6 GHz band: +21 dBm (18 dBm per chain) -Note: conducted transmit power levels exclude antenna gain. For total (EIRP) transmit power, add antenna gain + correlation gain.
Supported data rates (Mbps)	802.11b: 1, 2, 5.5, 11 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 802.11n: 6.5 to 400 802.11ac: 6.5 to 1,083 802.11ax (2.4GHz) 3.6 to 574 802.11ax (5GHz) 3.6 to 1,201 802.11ax (6GHz) 3.6 to 2,882
Wi-Fi Antennas	Integrated downtilt omni-directional antennas for 2x2 MIMO with peak antenna gain of 4.6 dBi in 2.4GHz, 7.0 dBi in 5GHz and 6.3 dBi in 6GHz. Built-in antennas are optimized for horizontal overhead orientation of the AP. The downtilt angle for maximum gain is roughly 30 to 40 degrees.

*This band disabled for use in EU and cannot be enabled by the end user or installer.
**The aggregate EIRP is limited to 20dBm (100mW)

6.2 RF Performance Table

The 2.4GHz transmitter has a maximum Radiated output power as follows:

Table 9: 2.4GHz Maximum Radiated Output Power

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2484	802.11b	20*	100
2412 - 2484	802.11g	20*	100
2412 - 2484	802.11n-HT20	20*	100
2412 - 2484	802.11n-HT40	20*	100
2412 - 2484	802.11ax-HE20	20*	100
2412 - 2484	802.11ax-HE40	20*	100

*The aggregate EIRP is limited to 20dBm (100mW)

The 5GHz transmitter has a maximum Radiated output power as follows:

Table 10: 5GHz Maximum Radiated Output Power

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5150 - 5895	802.11a	20.0*	100
5150 - 5895	802.11ac-VHT20	20.0*	100
5150 - 5895	802.11ac-VHT40	20.0*	100
5150 - 5895	802.11ac-VHT80	20.0*	100
5150 - 5895	802.11ax-HE20	20.0*	100
5150 - 5895	802.11ax-HE40	20.0*	100
5150 - 5895	802.11ax-HE80	20.0*	100

*The aggregate EIRP is limited to 20dBm (100mW)

The 6GHz transmitter has a maximum Radiated output power as follows:

Table 11: 6GHz Maximum Radiated Output Power

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5925 - 7125	802.11ax-HE20	20.0*	100
5925 - 7125	802.11ax-HE40	20.0*	100
5925 - 7125	802.11ax-HE80	20.0*	100
5925 - 7125	802.11ax-HE160	20.0*	100

*The aggregate EIRP is limited to 20dBm (100mW)

7 Technical Data

7.1 Electrical and Environmental Specifications

The CWAP meets the electrical and environmental test categories per Table 12 and Table 13.

Table 12: Qualification Test Matrix - Environment

Test Description	Test Spec	Test Section / Category
Temperature		
Ground Survival Low Temp and Short Time Operating Low Temp	DO-160G	§4.5.1, CAT A1
Operating Low Temperature	DO-160G	§4.5.2, CAT A1
Ground Survival High Temp. and Short Time Operating High Temp.	DO-160G	§4.5.3, CAT A1
Operating High Temperature	DO-160G	§4.5.4, CAT A1
Temperature Variation (2°/min)	DO-160G	§5.0 CAT C
Altitude (15,000 FT)	DO-160G	4.6.1 CAT A1
Decompression (50,000 FT)	DO-160G	4.6.2 CAT A1
Overpressure (170 kPA)	DO-160G	4.6.3 CAT A1
Humidity	DO-160G	6.3.1, CAT A
Waterproofness (140 l/m²/Hr)	DO-160G	10.3.2, CAT W
Vibration – Random	DO-160G	8.5.2, CAT S, Curve C
Operational Shock	DO-160G	7.2.1, CAT B
Crash Safety – Impulse (20g/11ms)	DO-160G	7.3.1, CAT B
Crash Safety –Sustained (12g/3s min) (1)	DO-160G	7.3.3,CAT B
Fungus Resistance (2)	DO-160G	13.0, CAT F

Notes:

(1) Crash Safety – Sustained satisfied by structural substantiation analysis and test, STP-700-00016-000 (Astronics)

(2) Fungus Resistance verified by analysis, FAS-700-00016-000 (Astronics)

Table 13: Qualification Test Matrix - EMI

Test Description	Test Spec	Test Section / Category
Magnetic Effect	DO-160G	§15CAT C
Power Input: Voltage and Frequency (ac)	DO-160G	§16.5.1.1.b CAT A(WF)X
Power Input: Voltage Modulation (ac)	DO-160G	§16.5.1.2 CAT A(WF)X
Power Input: Frequency Modulation (ac)	DO-160G	§16.5.1.3 CAT A(WF)X
Power Input: Momentary Power Interruptions (ac)	DO-160G	§16.5.1.4.b, c CAT A(WF)X
Power Input: Normal Transients, Normal Surge Voltage (ac)	DO-160G	§16.5.1.5.1.b CAT A(WF)X
Power Input: Normal Transients, Normal Frequency Transients (ac)	DO-160G	§16.5.1.5.2.b CAT A(WF)X
Power Input: Normal Frequency Variations (ac)	DO-160G	§16.5.1.6 b CAT A(WF)X
Power Input: Voltage DC Content (ac)	DO-160G	§16.5.1.7 b CAT A(WF)X
Power Input: Voltage Distortion (ac)	DO-160G	§16.5.1.8 CAT A(WF)X
Power Input: Abnormal Voltage and Frequency Limits in Steady State (ac)	DO-160G	§16.5.2.1 b CAT A(WF)X
Power Input: Momentary Undervoltage Operation (ac)	DO-160G	§16.5.2.2 b CAT A(WF)X
Power Input: Abnormal Surge Voltage (ac)	DO-160G	§16.5.2.3.1 b CAT A(WF)X
Power Input: Abnormal Frequency Transients (ac)	DO-160G	§16.5.2.3.2 b CAT A(WF)X
Power Input: Abnormal Frequency Variations (ac)	DO-160G	§16.5.2.3.3 b CAT A(WF)X
DC Current Content in Steady-State Operation (All ac Equipment)	DO-160G	§16.7.3
Inrush Current Requirements (ac and dc), Designation I	DO-160G	§16.7.5.2, CAT A(WF)I
Current Modulation in Steady-State Operation (ac), Designation L	DO-160G	§16.7.6 CAT A(WF)L
Power Factor (All ac Equipment)	DO-160G	§16.7.8 CAT A(WF)P
Voltage Spike	DO-160G	§17.4 CAT A
Audio Frequency Conducted Susceptibility – Power Inputs	DO-160G	§18 CAT R(WF)
Induced Signal Susceptibility: Magnetic Fields Induced into the Equipment	DO-160G	§19.3.1 CAT CW
Induced Signal Susceptibility: Electric Fields Induced into the Equipment	DO-160G	§19.3.2 CAT CW

Test Description	Test Spec	Test Section / Category
Induced Signal Susceptibility: Magnetic Fields Induced into Interconnecting Cables	DO-160G	§19.3.3 CAT CW
Induced Signal Susceptibility: Electric Fields Induced into Interconnecting Cables	DO-160G	§19.3.4 CAT CW
Induced Signal Susceptibility: Spikes Induced into Interconnecting Cables	DO-160G	§19.3.5 CAT CW
Radio Frequency Susceptibility: Conducted	DO-160G	§20.4 CAT T
Radio Frequency Susceptibility: Radiated	DO-160G	§20.5 CAT S
Emission of Radio Frequency Energy: Conducted RF Emissions	DO-160G	§21.4 CAT M
Emission of Radio Frequency Energy: Radiated RF Emissions	DO-160G	§21.5 CAT M
Lightning Induced Transient Susceptibility: Pin Injection Tests	DO-160G	§22.5.1 (Pin Injection - Damage Test) CAT A2
Lightning Induced Transient Susceptibility: Cable Bundle Tests	DO-160G	§22.5.2 (Cable Bundle - Multi troke/Multi Burst - Functional Upset) Ethernet Cables (shielded): CAT J2L2 AC Power, Discrete Inputs (connector J1 and J2, unshielded): CAT G2L2 Address strapping connections (on J3): CAT G2L2
Electrostatic Discharge	DO-160G	§25 CAT A

7.2 Mechanical Design and Dimensions

The CWAPs metal components include a proper finish to offer maintenance-free service over the life of the CWAP. The CWAP's internal chassis, circuit cards, wiring and cabling, and other major components are mounted and secured to provide maximum protection against imposed shock and vibration.

7.2.1 Top View

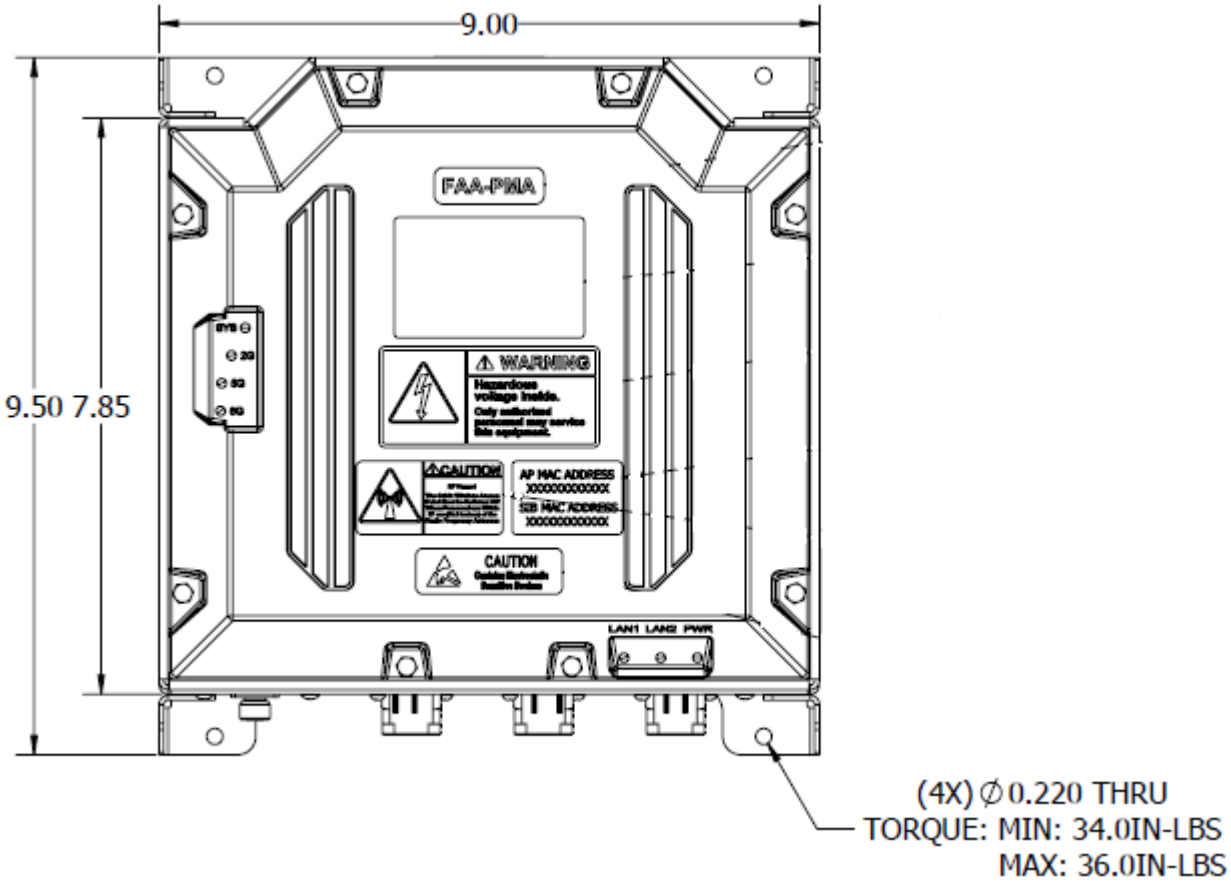

Figure 23: CWAP Top View

7.2.2 I/O Front View

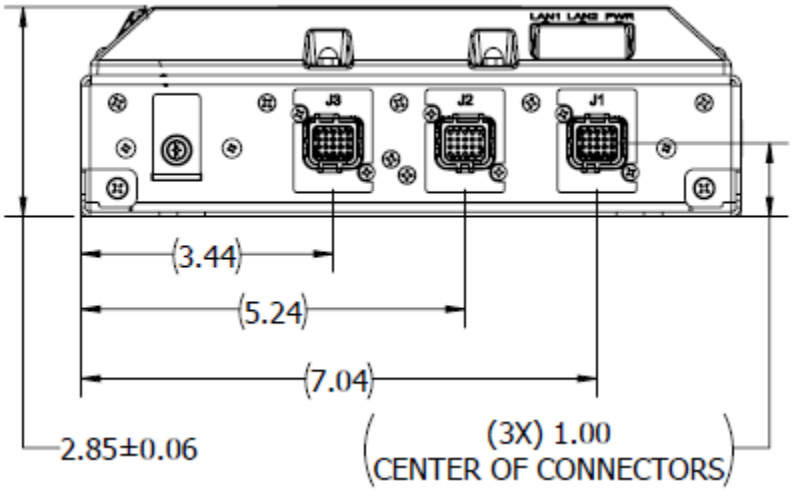

Figure 24:CWAP I/O Front View

7.2.3 Side View – Right

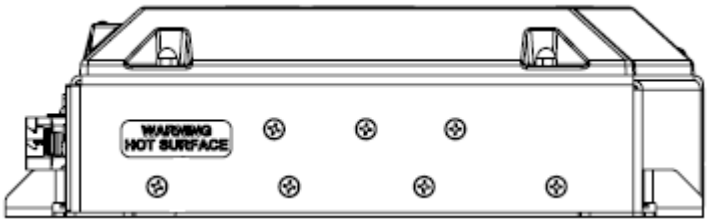

Figure 25: CWAP Side View - Right

7.2.4 Side View – Left

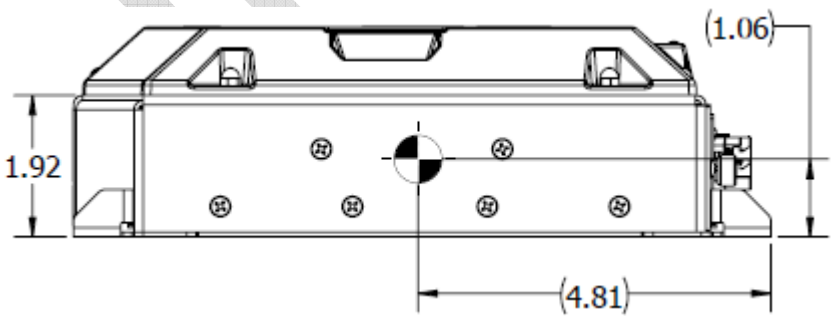

Figure 26: CWAP Side View - Left

7.2.5 Rear View

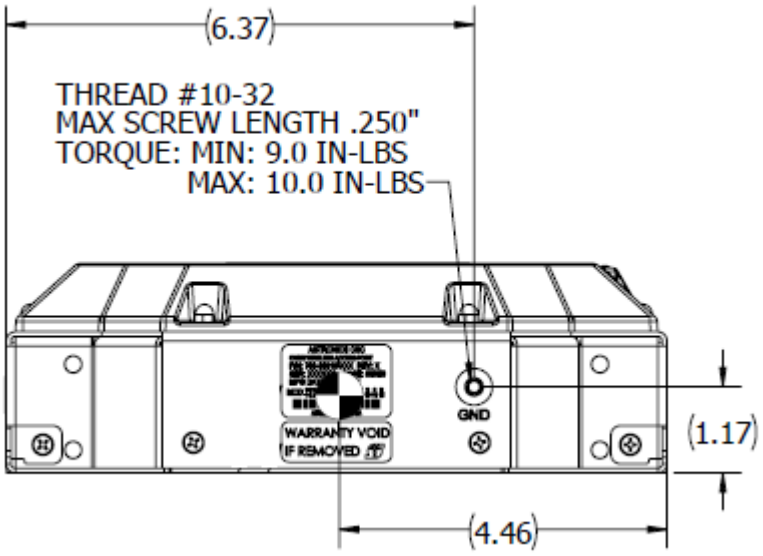

Figure 27: CWAP Rear View

7.2.6 Bottom View

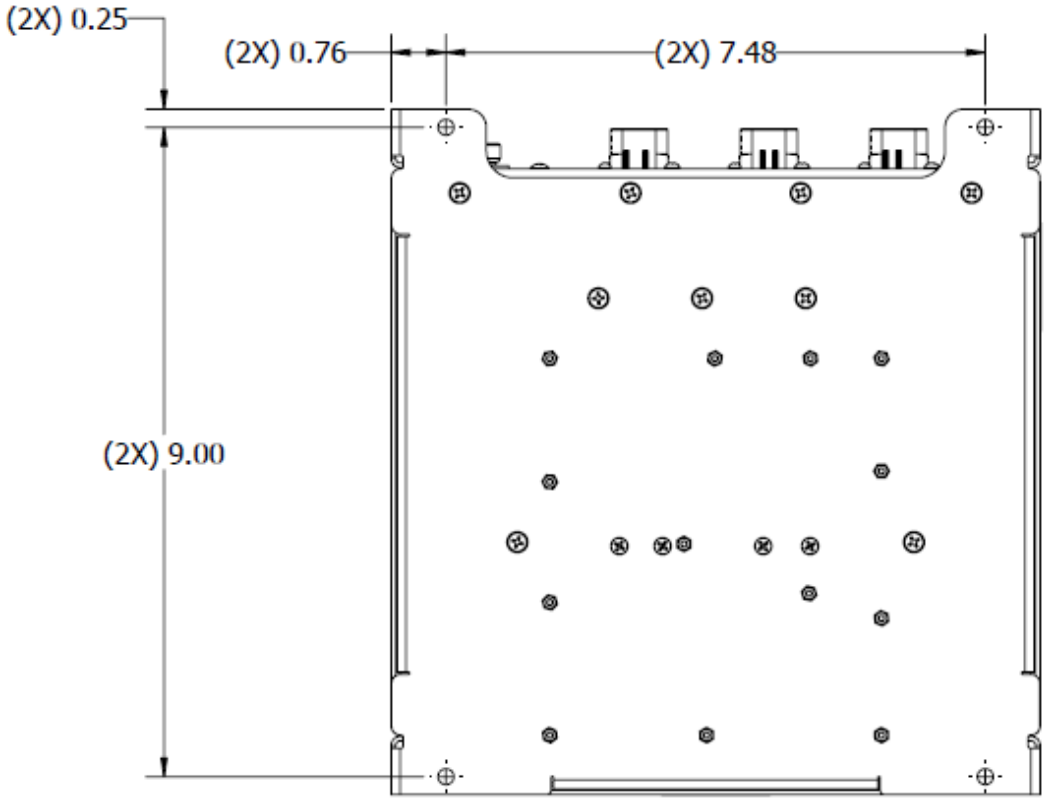

Figure 28: CWAP Bottom View

7.2.7 Product Identification

The Part Number Identification Label for each CWAP LRU is located on the rear panel and contains information as shown in Figure 27.

7.2.8 Finish and Color

The paint color of the CWAP is medium texture black. The bottom surface of the mounting plate is unpainted and contains a clear, RoHS compliant coating per MIL-DTL-5541, Type II, Class 3. The unpainted surface is provided for bonding of the CWAP enclosure to the aircraft airframe.

7.2.9 Materials

All materials used in the construction of the CWAP are inherently non-nutrient to fungus and do not support combustion. The materials are of the best commercial quality and will not blister, corrode, crack, soften, or show other immediate latent defects that affect the storage, operation, or environmental capabilities of the unit after any or all of the tests specified.

Materials used in the CWAP have been selected in accordance with the appropriate flammability requirements of Code of Federal Regulations FAR-25.853a.

7.2.10 Weight

The CWAP weighs 4.67 lbs. Nominal

7.2.11 Cooling Characteristics

The CWAP is designed with passive cooling.

- Operational Power Dissipation: 23.5 W Max
- Operational Power Dissipation: 20.2 W Nominal

7.2.12 Installation Limitations

The CWAP is intended to be installed in the crown of the cabin to provide adequate RF coverage of the Wi-Fi signal. An installation where there is a potential for falling water requires a drip shield. Installations per ARINC 628 part 7 (Stand Alone) shall always have the minimum air gap spacing as follows:

- Bottom (G1) = 0.00”
- Left (G2) = 1.00”
- Right (G3) = 1.00”
- Top (G4) = 1.00”
- Front (G5) = 3.00”
- Rear (G6) = 1.00”

Installations violating the above air gap spacing must be approved by Astronics CSC engineering.

There are no minimum installation distances between CWAPs. The maximum distance shall be determined by aircraft type and configuration and content (e.g. throughput considerations).

Radiation Hazard: Maintain a safe distance when in operation. The device should be installed to provide a minimum distance of 27cm to nearby persons while in operation. Remove power if working within these distances.

7.3 Grounding and Bonding

Electrical grounding and bonding of the CWAP unit follow standard avionics industry design practices, ensuring proper grounding for electrical safety and for Electromagnetic Interference (EMI) control and compliance.

7.4 Workmanship

Workmanship, including ANSI/IPC-A-620 soldering, is designed to meet ANSI/J-STD-002 and RTCA/DO-254.

7.5 Safety

The CWAP is designed to meet the safety requirements of RTCA/DO-254.

7.6 Protective Devices

The CWAP contains a power line fuse that provides electrical separation between the airplane AC power and the CWAP system in the event of a circuit upset per the recommendations of RTCA/DO-254. All input/output signals within the CWAP contains ESD (TVS) protective Diodes and/or isolation transformers that will provide protection from external noise/ESD/lightning. The protection devices have fail-safe features, ensuring that any failure does not create a hazardous condition to the CWAP.

The CWAP has a dual output temperature sensor to protect the internal electronics from an over-temperature or under-temperature condition. Additionally, a separate temperature sensor is in place to enable/disable the unit based on low ambient temperatures (below -20ºC).

8 Reliability and Maintainability

8.1 Reliability

The Mean Time Between Failure (MTBF) for the CWAP is a minimum of 270,000 operating hours calculated using the RIAC 217+ (AIC, +30°C, 65% duty cycle, 1428 cycles per year).

8.2 Maintainability

The CWAP is considered an LRU and is repairable only by Astronics CSC or an authorized repair facility. Periodic maintenance of the CWAP is not required.

8.3 Mean Time to Repair (MTTR)

Repair time will not exceed 30 minutes, which entails replacement of the LRU on the aircraft.

8.4 Failure Detection and Fault Isolation

LED indicators located on the system enclosure provide functional status of the CWAP.

8.5 Production Testing

Production units are subjected to Environmental Stress Screening (ESS) and a production Acceptance Test Procedure (ATP) prior to shipment. These tests are intended to ensure that all elements of the product are functional and capable of performing at both high and low temperature extremes and that they are free of manufacturing defects. The Acceptance Test Procedure is run pre- and post-ESS to test the functional characteristics of the product.

9 Support and Service

9.1 Technical Support

For technical support, please contact support@Astronics.com.

9.2 Returning Defective Equipment

All equipment returned to Astronics CSC must have a Return Material Authorization (RMA) number assigned exclusively by Astronics CSC. Astronics CSC cannot be held responsible for any loss or damage caused to the equipment received without an RMA number. The Buyer accepts responsibility for all freight charges for the return of goods to the Astronic CSC designated facility. Astronics CSC will pay return freight charges back to the Buyer's location in the event that the equipment is repaired or replaced within the warranty period stipulated herewith.

Contact and Delivery Address

Astronics CSC
804 S. Northpoint Blvd.
Waukegan, IL 60085
Attn: RMA number

Revision History				
Date	**Revision Level**	**Description of Change**	**Written By**	**Approved By**
07-26-2022	A	Initial Release per ECO-1471	Mike O'Connor	David Fay