



LAND



SEA



AIR



# F1-300

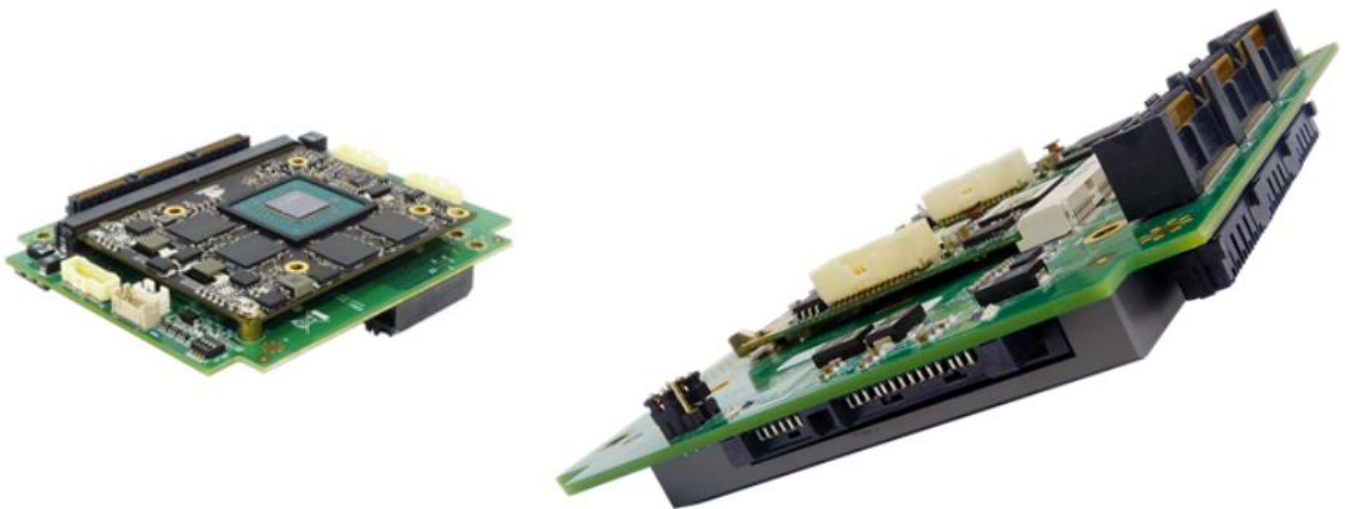
CORE I7 RUGGED MILITARY  
AIRBORNE MODULAR COMPUTER



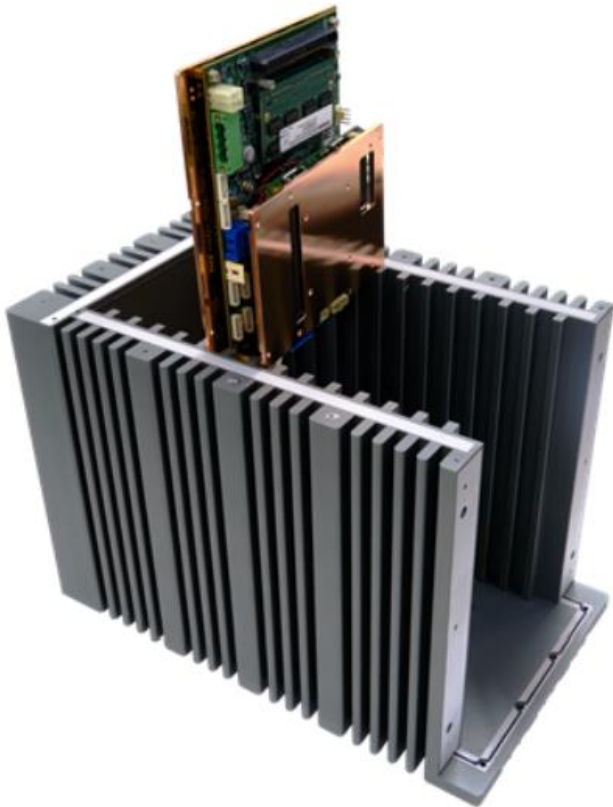
## POWER AUTOMATION COMPUTER

- Rugged COTS computer with Intel® 5th generation Core- i7 processor
- NVIDIA® GPU GT950M/GTX 1050 Ti supports CUDA 684/CUDA 768 independent displays by 4 x DP
- Modular rugged chassis with stackable PCIe/104 I/O card expansion.

**ATR (Air Transport Rack)** is a standard that specifies form fit and function of enclosures designed to protect the main internal system. This military enclosure must meet EMI / EMC requirements to prevent noise interference, provide lightning protection and be isolated from small particle contaminants. So, it can be deployed in unmanned aerial vehicles, fighters, and helicopters. To satisfy diverse conditions, ATR chassis are available in different sizes—1/2, 3/4 and Full ATR sizes. Based on 3/4 ATR size, STACKRACK launches a new Rugged Airborne Mission Computer F1-30. As a modular mission computer, F1-30 has mechanical features for mounting in horizontal orientation, offering open architecture to maximize use of interoperability. For example, together with PCIe/104 expansion connectors, F1-30 is able to build a stackable architecture, which can be integrated with PCIe/104 expansion modules depending on customers' need, hence it's highly configurable to specific requirements. Founded on such an open structure, it is an optimum choice for high performance mission computing, demanding graphics generation applications, and GPU-accelerated data processing.



**F1-30** is driven by Intel 5th generation Broadwell i7-5650U processor soldering onboard which is an extremely compact Core I-based fanless rugged airborne computer. Broadwell processor supports outstanding CPU and graphics performance, providing dual cores 3.2GHz clock speed.



- **RICH Feature Support**

F1-30 is regarded as a StackPC with a rich-featured board with a various I/O requirements applied to feature compact, rich functionality, solid performance, multi-displays, wide temperature, and low power consumption for applications which size and power efficiency are required . F1-30 can take the advantages of processors soldering onboard and extended operating temperature from -40 to 85°C to ensure ultimate durability, utmost resistance to shock & vibration. Although F1-30 features a completely sealed enclosure with M12/D38999 connectors for the I/O interfaces and it's compliant to IP65, it's able to maintain CPU and GPU full speed at extreme temperatures by the conduction cooling method developed by 7STARLAKE.

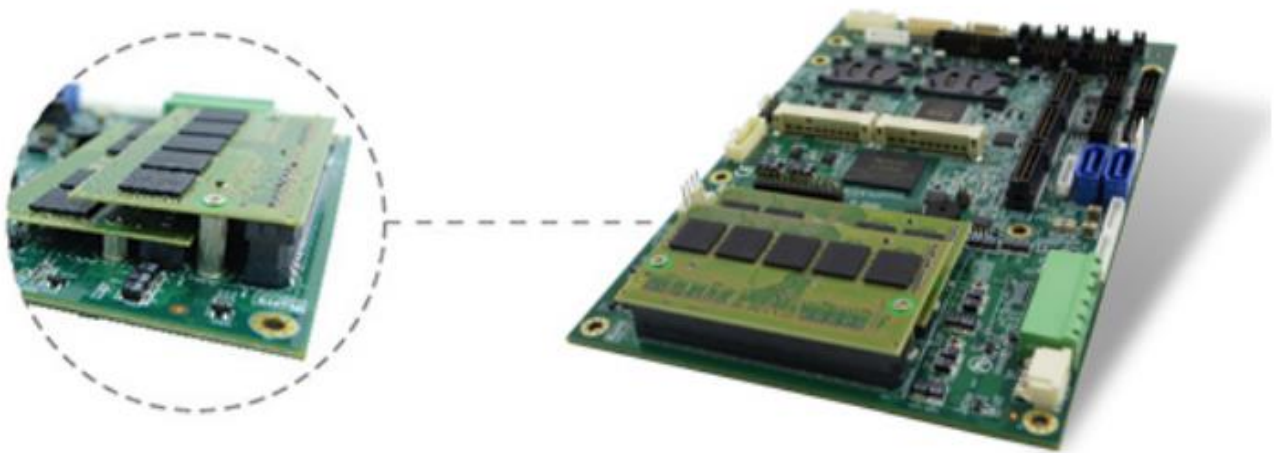
- **Expandable Multi I/O Interfaces**

F1-30's mainboard equips extensive I/O interface to fulfill different application requirements. The board supports four XR-DIMM RAM up to 16 GB, offers 2x LAN, 6x USB and

4x COM for device connects ability, The versatile expansion compatibility also includes two full-size miniPCIe that could add on additional I/O or additional functionality. And also for reserving the PIN header which can be added on extra feature to meet different embedded applications. With MXM slot can integrate with graphic card for image processing usage. The StackPC Specification defines new approach to stackable systems design and development. The specification includes all valuable heritages of PCIe/104 standards along with the new features of StackPC connector. 03 The main competitive distinction of the StackPC connector is the combination of most popular low speed interfaces such as USB, COM, CAN, SPI, LPC and high speed SATA, Gigabit Ethernet and PCI-Express x1, x4 within one stack expansion connector.

- **Rugged DIMM**

F1-30 uses the most robust rugged memory module memory XR-DIMM which has the innovative board-to-board connector design to fit tightly and securely onto the motherboard and perfect for critical-mission applications and harsh environments. Furthermore, both ECC and Wide Temperature (-40°C to 85°C) features are available to further optimize the module if needed. In addition, it adopts the highly durable 300-pin connector and mounting holes to effectively prevent memory modules from dislocating or coming away due to vibration or strong impact. This greatly improves the reliability of memory signal transmissions, serving as the strongest support for applications working under severe environments.

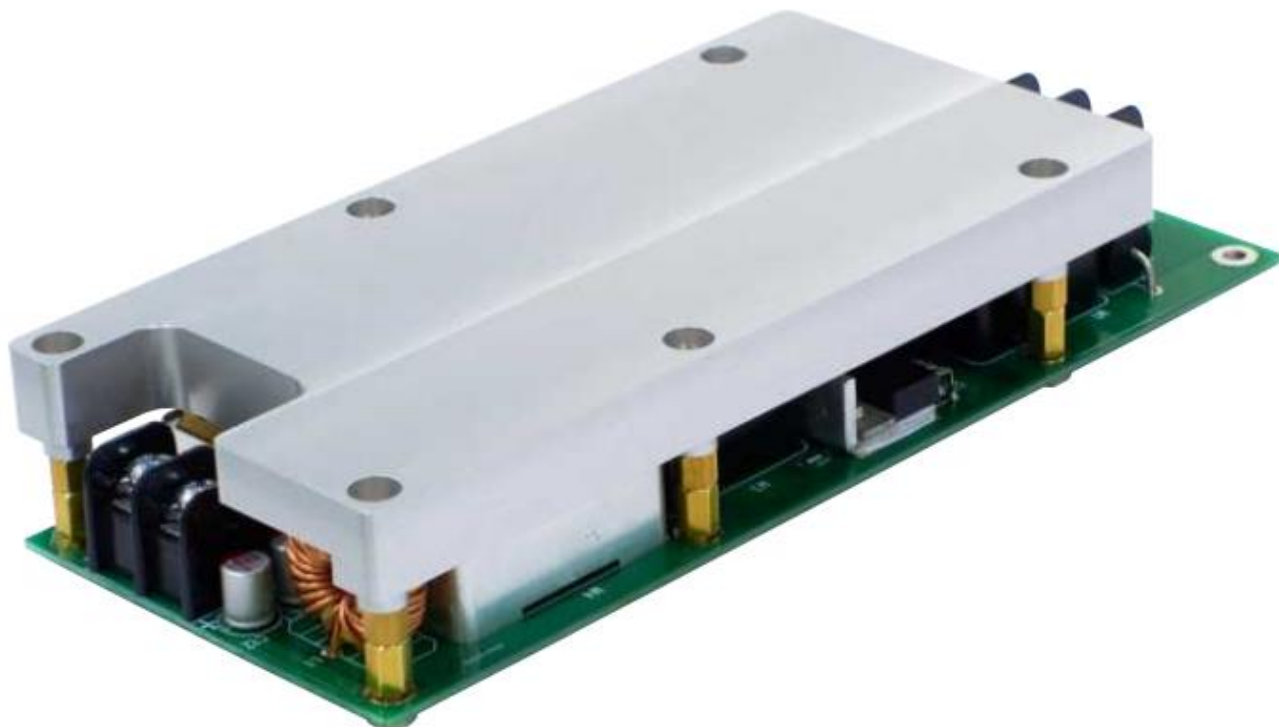


- **64GB SSD Soldered on board**

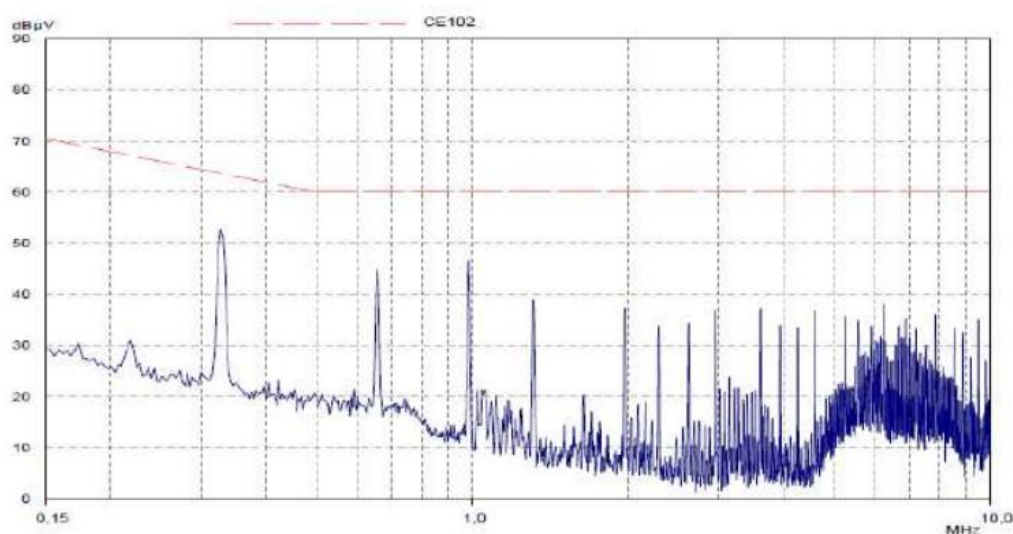
The soldering 64GB military-grade ruggedized onboard SSDs has the technologies of thermal throttling function: When continuously executing intensive reading and writing, the temperature of the SSD rises, which could lead to or increase the risk of device malfunction or damage. To prevent the system from overheating and sustaining damage, the rugged SSDs are equipped with thermal throttling technology for temperature control, reducing operating speeds during high temperature to prevent hardware damage. Moreover, the underfill strengthens the soldering points of BGA packages, enhances anti-vibration properties, and reduces damage from thermal stress. It not only effectively reinforces anti-vibration and ensuring stable operations in highly sulfuric or stringent/extreme climate conditions, but also prolongs product life.

## MIL-STD-1275/704 Power Supply

**F1-30** is designed with MIL-STD-1275/704, protecting against vehicle/aircrafts voltage surges, spikes and transients, and even electromagnetic interference. This characteristic is well suited for the strictest military requirement and deliver optimal performance in harsh conditions.



The GAIA Hi-Rel DC/DC CONVERTER also provides under voltage Lockout (UVLO), Output over Current Protection (OCP), Output Overvoltage Protection (OVP) and Over Temperature Protection (OTP) to made stability and safety.

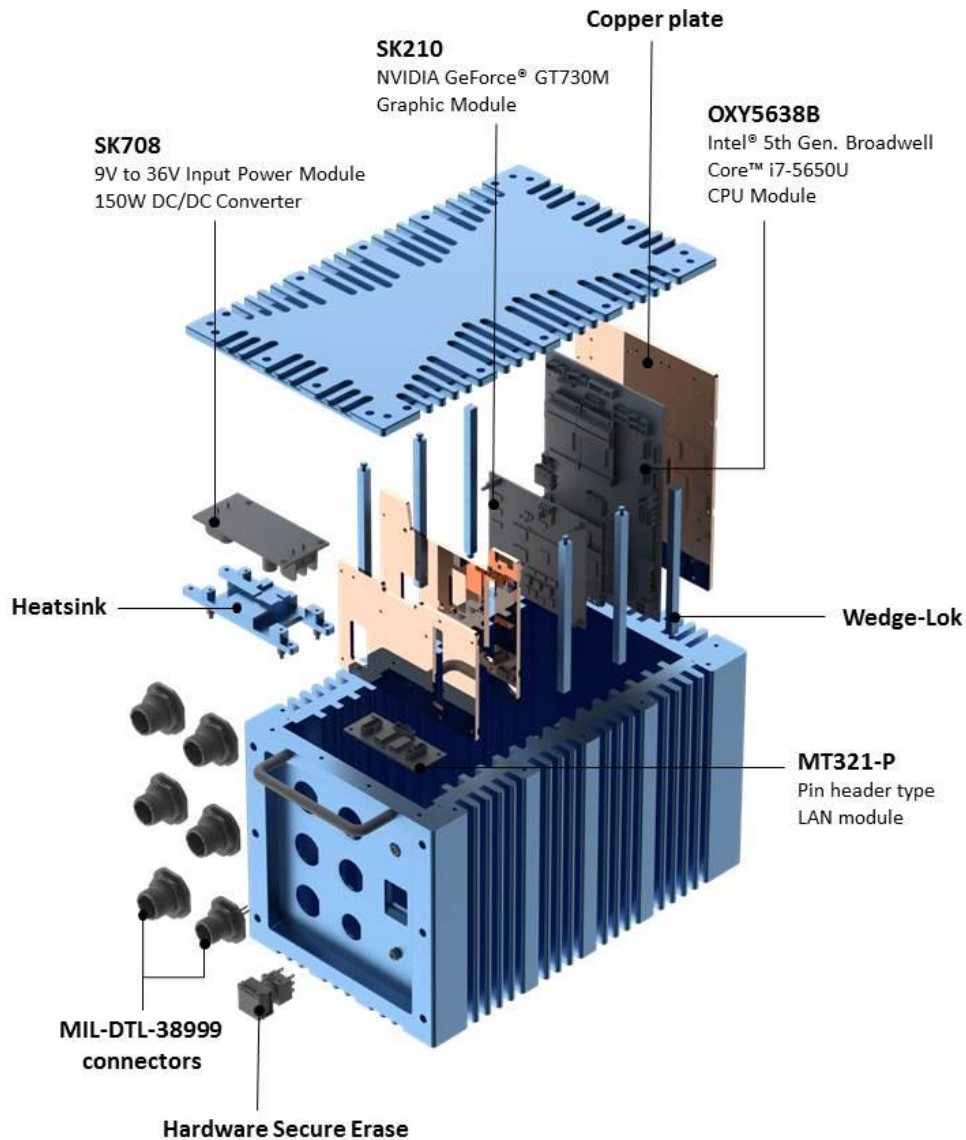


Module Compliance with MIL-STD-461C/D/E Standards

## Thermal Solution

### Conductive Cooling Modules for Extreme Power

A solid material that can effectively conduct the heat is used to move the heat to the system enclosure and dissipated to the external surroundings. The machined copper cooling plates matching the component layout are placed between each layer; heat is carried away to the edges where a Wedge-Lock mechanism secures inside the chassis, coming up with a thermal interface.



# Specifications

## SYSTEM

|             |                                                |
|-------------|------------------------------------------------|
| Model       | F1-30D1/F1-30M1                                |
| CPU Type    | Intel®Core™ i7-5650U (4M Cache, up to 3.2 GHz) |
| Memory type | 2 x DDR3 1333/1600MHz XR-DIMM Up to 16GB       |

## STORAGE

|                 |                                           |
|-----------------|-------------------------------------------|
| HDD/SDD support | 1 x 2.5" SSD 2 x mSATA SSD backup storage |
|-----------------|-------------------------------------------|

## I/O

|              |                                                                |
|--------------|----------------------------------------------------------------|
| COM          | 2                                                              |
| Ethernet     | 4                                                              |
| USB          | 4 x USB 2.0                                                    |
| VGA          | 1                                                              |
| DC-in        | 1                                                              |
| Power Button | 1 x Waterproof Button with Backlight                           |
| Connectors   | F1-30D1: Amphenol D38999 Connectors<br>F1-30M1: M12 Connectors |

## MECHANICAL

|                       |                        |
|-----------------------|------------------------|
| Housing               | Aluminum               |
| Weight                | 16 Kg (35.24 lb)       |
| Ingress Protection    | IP65                   |
| Dimension (W x H x D) | 190.5 x 230 x 320.5 mm |

## POWER REQUIREMEN

|               |                                                                                                                 |
|---------------|-----------------------------------------------------------------------------------------------------------------|
| Input Voltage | Optional 1: DC-IN 9V~36V, 150W Max Optional 2: DC-IN 10V~40V, 150W Max<br>(Compliant with MIL-STD-1275/704/461) |
|---------------|-----------------------------------------------------------------------------------------------------------------|

## ENVIRONMENTAL

|                    |                                                 |
|--------------------|-------------------------------------------------|
| Operating Temp.    | -40°C to 75°C                                   |
| Storage Temp.      | -40°C to 85°C                                   |
| Relative Humidity  | Up to 95%RH @40°C, non-condensing               |
| Ingress Protection | Designed for compliance with IP65, MIL-STD-810G |

## TEST STANDARD

|                   |                               |
|-------------------|-------------------------------|
| EMI/EMC           | Designed to meet MIL-STD-461F |
| Temperature       | Designed to meet MIL-STD-810G |
| Vibration & Shock | Designed to meet MIL-STD-810G |

## STACKABLE MODULE

|       |                                                                                                                                                                      |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SK506 | PCIe/104(StackPC FPE module) Expand 4 extra 10/100/1000 mbps Gigabit Ethernet                                                                                        |
| SK509 | PCIe/104(StackPC) I/O module                                                                                                                                         |
| SK210 | NVIDIA GeForce® GT 730M PCIe104-FPE Graphic Module, Supports Four DP outputs                                                                                         |
| SK220 | PCIe/104(StackPC FPE) MXM Graphics Card for 1VGA & 4 DisplayPort Module Support NVIDIA® GT950M/GTX1050Ti/GTX1060M Graphics Card                                      |
| SK401 | Storage carrier with one 2.5" HDD/SSD socket and two mSATA socket PCIe/104 SSD/mSATA/Mini PCIe Carrier, support 1x 2.5" SSD + 2x mini PCIe LAN module (MT321/MT321R) |
| SK708 | Wide Input Range 150W DC/DC Power Converter Module with 9V~36V OXY5638A is DC12V, need to convert with Wide Input Range Power Module                                 |
| SK710 | Optional module by request :Wide Input Range: 12V to 40V w/ EMI Filter, Compliant with MIL-STD 1275/704/461                                                          |

## Ordering Information

F1-30

Core i7 Rugged Military Airborne Modular Computer -

Small Form Factor (SFF) with PCIe/104 Architecture GPU/CPU Open , Scalable Structure

## Dimension



## APPEARANCE

