myOPALE
BEYOND THE LIMITS
The new PCI Express over Cable Concept, imagined by ECRIN Systems, will multiply the capabilities of your next Computer in smaller footprint.

For three decades, Industrial PC’s use two key types of architecture inside: ATX/mini-ITX motherboard or PICMG® passive backplane. In both cases, the SBC and its I/O cards staid physically linked through Peripheral Component Interconnect PCB - PCI Express promoted by PCI-SIG®.

**myOPALE CONCEPT**

myOPALE concept is based on four major principles:

- Broken mechanical link between CPU and I/O cards thanks to PCI Express Over Cable interconnection;
- Building blocks in a standard 5.25’’ form factor;
- Re-Use of widely deployed interconnect standards from SNIA/SFF Technology Affiliate that encompass cables, connectors, form factor sizes and housing dimensions;
- Thermal solution at building blocks level.

**LONG LIFE MANAGEMENT**

- Embedded INTEL platforms roadmap exclusive
- 10 years certified longevity
- COM Express design for longevity and newer technology
- Revision number control

**SECURITY AND MANAGEMENT**

- SEMA Board Controller Agent
- Built in Test with configuration checking
- AMT remote management

**TIME TO MARKET**

- COTS building blocks ready for immediate system integration services by ECRIN Systems or customer
- Stock for production
- Cost effectiveness

**COMPUTE DENSITY**

- Low Power Modular Blades with I/O’s
- Up to 5 Full height I/O cards extension in 1U/19’’ chassis

**RELIABILITY**

- CPU Conduction cooled design
- Extended Temperature option available
- Shocks and vibrations proven
- Redundant system in a unique footprint

**HIGH FLEXIBILITY**

- Interchangeability for each module CPU or I/O thanks standard half-height 5.25’’
- Front or rear I/O with easy customised connectors (MIL-38999, XLR, Coax, M12)

**HIGH PERFORMANCE/WATT**

- Quad-Core i7 Gen6 (Skylake) & Gen7 (Kaby Lake)
- 24 x PCIe Gen3 lanes available for external I/O
- NVMe high throughput storage via direct PCI Express interconnect
- Low power consumption with TDP 25 to 45W

**CUSTOMER KEY BENEFITS**

- Remote Embedded Modular Computers
### Module specifications

**Construction**
- Anti-corrosion and long term heavy-duty steel, black color

**Dimensions (W x H x D)**
- 5.25'' with 7.9 inch depth (146x42x200mm)

**Weight**
- 1.45 kg

**Cooling**
- Cold plate with Push Pull forced air cooled - Two 40mm ball bearing fans with monitoring

**Power Supply**
- ATX mode : +12V and 5Vstb
- AT mode : +12V only

**Drive Bay**
- Internal drive bay for 2.5'' SATA 6.0 Gb/s SSD

**Carton Size (W x H x D)**
- 220x120x270 mm

### Processor specifications

**Skylake**
- 6th Gen Intel® Core™, Intel® Xeon® E3-1500 v5 Processor
- CM236 (supports ECC memory, Intel® AMT)
- QM170 (supports non-ECC, Intel® AMT)
- ECC memory support
- Intel® AMT for remote management
- Intel® AMT Board Controller
- Built In Test ECRW (Power-on BIT with Configuration checking, Continuous BIT, Maintenance BIT)
- Skylake: Intel® AMT
- Kaby lake: Intel® AMT

**Kaby lake**
- 7th Gen Intel® Core™, Intel® Xeon® E3-1500 v6 Processor
- CM238 (supports ECC memory, Intel AMT)
- QM175 (supports non-ECC, Intel AMT)
- non-ECC memory support
- Built In Test ECRW (Power-on BIT with Configuration checking, Continuous BIT, Maintenance BIT)
- Skylake: Intel® AMT
- Kaby lake: Intel® AMT

**System Monitoring and management**
- Windows 10/8.1 64-bit, Windows 7 32/64-bit
- Linux 64-bit
- Windows 10 64-bit, Windows 10 IoT Enterprise 64-bit
- Linux 64-bit, VxWorks

### Environmental specifications

**Temperature**
- Operating: 0°C ~ 55°C (*)
- Storage: -40°C ~ 85°C

**Humidity**
- Operating: 5 to 90% non-condensing

**Altitude**
- 0-3000m (0-10,000ft) operating

**Shock (with SSD)**
- Operating: 25G @ 1ms / 20G @ 20ms - 6 axis (MIL STD 810 G, method. 514.6)

**Vibration (with SSD)**
- Operating: 5-7Hz / 10mm, 10-2000Hz / 2G - 3 axis, 2 sweeps, 15min (MIL STD 810 G, method. 514.6)

**CE Certification**
- EMC: 2014/30 / EU
- SAFETY: 2014/35/UE

### Software

**Operating System**
- Windows 10/8.1 64-bit, Windows 7 32/64-bit
- Linux 64-bit
- Windows 10 64-bit, Windows 10 IoT Enterprise 64-bit
- Linux 64-bit, VxWorks

**Intel® Core™ Gen6 / Gen7**
- Xeon E3-1505Lv5 2.0~2.8GHz, 8MB, 45W (4C/8T, GT2)
- Core™ i5-6440EQ 2.7~3.4GHz, 6MB, 45W (4C/4T, GT2)
- Core™ i3-6102E 1.9GHz, 3MB, 25W (2C/4T, GT2)

**Intel®® Core™ Gen6 / Gen7**
- Xeon E3-1505Lv5 2.0~2.8GHz, 8MB, 45W (4C/8T, GT2)
- Core™ i7-6820EQ 2.8~3.5GHz, 8MB, 45W (4C/8T, GT2)
- Core™ i5-6442E 2.7~3.4GHz, 6MB, 45W (4C/4T, GT2)
- Core™ i3-6100E 2.9GHz, 3MB, 35W (2C/4T, GT2)

**Intel®® Core™ Gen6 / Gen7**
- Xeon E3-1505Lv6 2.0~2.8GHz, 8MB, 25W (4C/4T, GT2)
- Core™ i7-7820EQ 3.0~3.7GHz, 8MB, 45W (4C/8T, GT2)
- Core™ i5-7440EQ 2.9~3.6GHz, 6MB, 45W (4C/4T, GT2)
- Core™ i3-7100E 2.9GHz, 3MB, 35W (2C/4T, GT2)

**Intel®® Core™ Gen6 / Gen7**
- Xeon E3-1505Lv6 2.0~2.8GHz, 8MB, 25W (4C/4T, GT2)
- Core™ i7-7820EQ 3.0~3.7GHz, 8MB, 45W (4C/8T, GT2)
- Core™ i5-7440EQ 2.9~3.6GHz, 6MB, 45W (4C/4T, GT2)
- Core™ i3-7100E 2.9GHz, 3MB, 35W (2C/4T, GT2)

**Intel®® Core™ Gen6 / Gen7**
- Xeon E3-1505Lv6 2.0~2.8GHz, 8MB, 25W (4C/4T, GT2)
- Core™ i7-7820EQ 3.0~3.7GHz, 8MB, 45W (4C/8T, GT2)
- Core™ i5-7440EQ 2.9~3.6GHz, 6MB, 45W (4C/4T, GT2)
- Core™ i3-7100E 2.9GHz, 3MB, 35W (2C/4T, GT2)

**Intel®® Core™ Gen6 / Gen7**
- Xeon E3-1505Lv6 2.0~2.8GHz, 8MB, 25W (4C/4T, GT2)
- Core™ i7-7820EQ 3.0~3.7GHz, 8MB, 45W (4C/8T, GT2)
- Core™ i5-7440EQ 2.9~3.6GHz, 6MB, 45W (4C/4T, GT2)
- Core™ i3-7100E 2.9GHz, 3MB, 35W (2C/4T, GT2)
**Module specifications**

<table>
<thead>
<tr>
<th>Construction</th>
<th>Anti-corrosion and long term heavy-duty steel, black color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (W x H x D)</td>
<td>5.25&quot; x 7.9 inch depth (146x42x200mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.5 kg</td>
</tr>
<tr>
<td>Card lock</td>
<td>Holding part for full height and low profile PCIe board</td>
</tr>
<tr>
<td>Power Supply</td>
<td>+12V only</td>
</tr>
<tr>
<td>Front panel</td>
<td>2x full height PCIe board</td>
</tr>
<tr>
<td>Rear panel</td>
<td>8x PCIe Gen3 link on 2x mini-SAS HD</td>
</tr>
<tr>
<td>Carton Size (W x H x D)</td>
<td>220x120x270 mm</td>
</tr>
</tbody>
</table>

**Backplane specifications**

| I/O expansion       | Version 1: 2x PCIe x4 slots (PCIe x16 connector)           |
|                     | Version 2: 1x PCIe x8 slot (PCIe x16 connector)             |
|                     | Support half size and full length PCIe card                 |
| Power Supply        | 12V to 3.3V DC converter                                    |
|                     | Remote control from myOPALE-CPU module (through mini-SAS HD Sideband) |
| Fan control         | 3-wire fans (x2)                                           |
|                     | On board and remote temperature sensors                     |
|                     | Programmable Look Up Table for temperature / fan speed monitoring |
|                     | Remote control from myOPALE-CPU module (through mini-SAS HD Sideband) |
| Remote power        | WAKE signal to myOPALE-CPU module (through mini-SAS HD Sideband) |

**Environmental specifications**

| Temperature         | Operating: -10°C ~ +55°C (*) / Storage -40°C ~ +85°C (*) extended temperature on request |
| Humidity            | Operating: 5 to 90% non condensing                          |
| CE Certification    | EMC: 2014/30 / EU SAFETY: 2014/35/UE                        |

**System Monitoring and management**

- Remote power, temperature and fan monitoring from myOPALE-CPU module

---

**Note:** The information in this document is subject to change without notice and should not be considered as a commitment by ECRIN Systems. While reasonable precautions have been taken, ECRIN Systems assumes no responsibility for any error that may appear in this document. OPALE is a registered trademark of ECRIN Systems. All other trademarks or registered trademarks are the properties of their respective owners.
myOPALE provides a simple method for extended applications that need more I/O boards than were fitted in a standard Industrial PC based on backplane PCB. Here are some application examples where myOPALE concept is demonstrated as a major differentiator from the legacy Industrial PC’s.

High density: up to 5 I/O slots in 1U/19”/490mm

- Everywhere the footprint is The Key Point: Data center, Telecom, Broadcast, Base Station Control...

COTS solution
- 1U, 19”, 490mm depth
- 4x locations for 5.25” myOPALE building blocks
- 1U power supply
- Front panel for button, LEDs, USB
- High density: up to 5 PCIe x4 or x8 I/O cards
- Two systems in one: redundancy in a unique footprint
- Rear or Front I/O connectors from the shelf

COTS solution
- PCIe over cable mini-SAS HD connector allows to move back I/O cards in myOPALE-iO to provide custom connectors independently from myOPALE-CPU, on front or rear panel.
- Will support full size and full height I/O cards on front and rear panel.

COTS solution
- OPALE V2 (Modified COTS) - 4U / 19” / 450mm depth
- Six myOPALE-CPU modules in 4U footprint
- Up to two I/O cards per Modular Computer
- Drive bay for 8x 2.5” NVMe or SATA SSD
- COTS variant with Dual in one use case:
  - OPALE V2 (COTS) - 4U / 19” / 450mm depth
  - Two myOPALE-CPU module
  - Up to five I/O cards per system
  - Redondance N+1

Modified COTS solution
- Building-Blocks puzzle
- Optimized foot print
- High Density integration
- Time to Market
- Risk Management
- Few NRC

Impossible with legacy Industrial PC

Impossible with legacy Industrial PC

No equivalent on the market

COTS Extension
Just by adding one COTS PCIe or M.2 adaptor to mini-SAS HD card on your ATX mother board, you can add myOPALE-iO on front panel of your desktop or minitower PC.

PCIe x4 to mini-SAS HD converter
M.2 to mini-SAS HD converter

myOPALE-iO on easier PC front access

Audio Music, NVIDIA Gamer, Broadcast, Info-Comm, Network...
YOUR LEADING TRUSTED PARTNER FOR EMBEDDED

ECRIN Systems is both Manufacturer and System Integrator

MANUFACTURER, we became in 2007

• Thanks to the proximity and great commitment we develop with our leading trusted customers and huge experience acquired in embedded market since 1976, our marketing department knows what you will need in terms of systems and services for the next five years. At ECRIN Systems, we innovate and create the disruptive technology and products that will carry your project up to the success with complete satisfaction.

• Always driven by flexibility, long life and re-use principles, all our COTS System platforms are modular, based on embedded open standards driven by PICMG®, PCI-SIG® and VITA® normalization comities, to be easily configured, modified and customized according to your unique and specific requirements with SWaP constraints into industrial environments.

• myOPALE is a new demonstration of our DNA, thanks this new generation of ready to use building blocks that nobody imagined before our R&D engineers done it.

SYSTEM INTEGRATOR, we are since 40 years

• With 70% of our business driven by project to develop Computer-on-Demand, we re-use our proven COTS System building blocks and IPs to reduce your time to market, manage the risk during development phase and reduce your non-recurrent cost. Dedicated Project Manager with Project Quality Engineer will assist you all along the program. With myOPALE new infrastructure, we are able to develop and build SWaP high density systems that was not doable until now in such Small Form Factor.

• If myOPALE concept makes sense for you, do not hesitate to contact us. We will provide your complete integrated computer with Environmental Qualification Tests passed and mandatory Certification stickers for domestic and export countries.