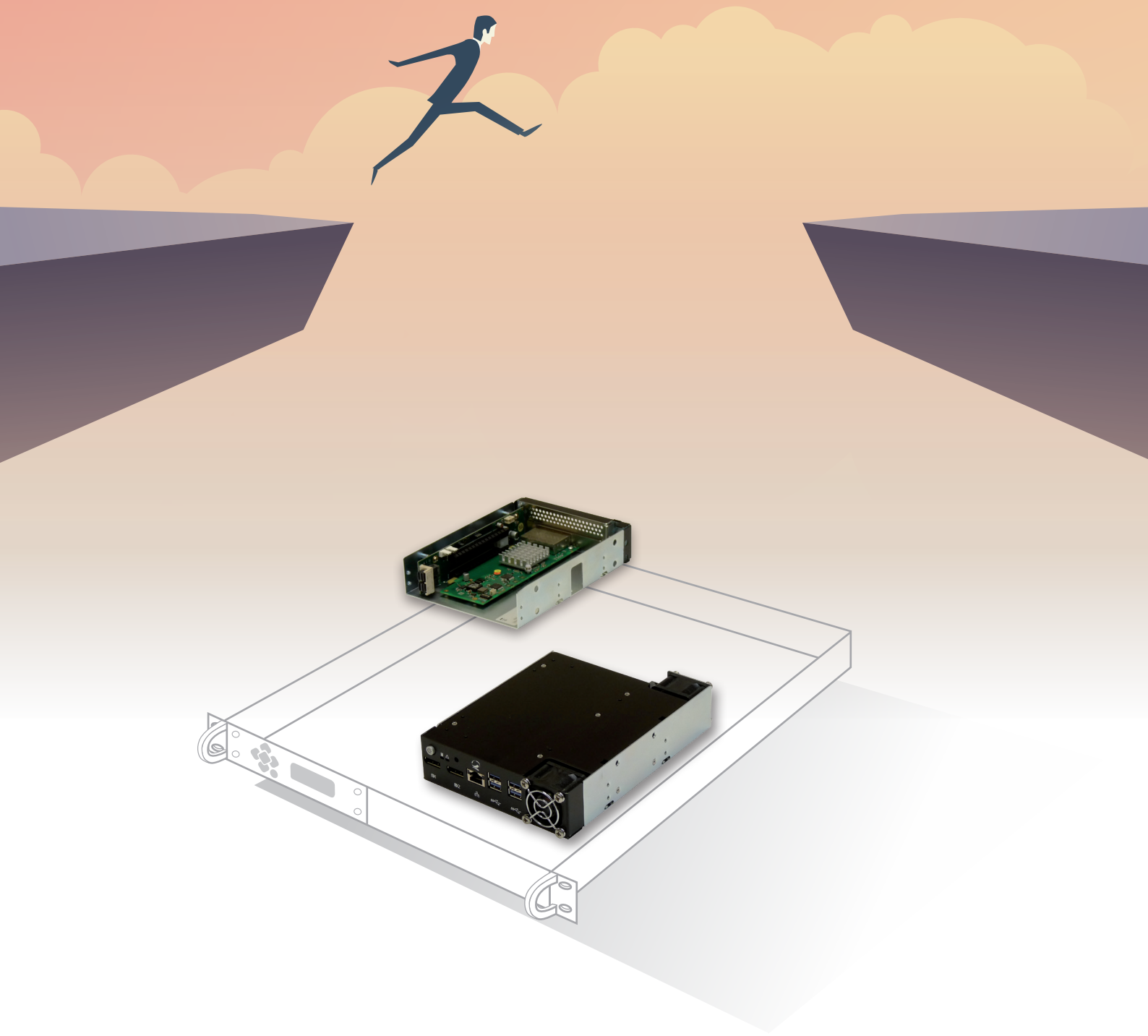
myOPALE

BEYOND THE LIMITS



ecrin SYSTEMS

myOPALE Remote Embedded Modular Computers

The new PCI Express over Cable Concept, imagined by ECRIN Systems, will multiplie the capabilities of your next Computer in smaller foot print.

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.

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

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

CUSTOMER KEY BENEFITS

HIGH FLEXIBILITY

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

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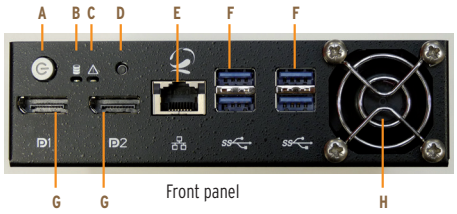
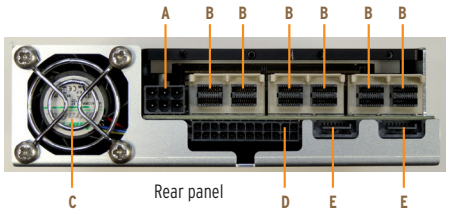
myOPALE-CPU

Module specifications



A & D: Power, Reset buttons,
B & C: SSD, Default LEDs
E: GbE

F: USB 3.0 (x4)
G: Display Port (x2)
H: Air Inlet / Outlet



A: Power Supply (12V, 5Vstb, PS-ON)
B: 24x PCIe Gen3 link(1),
mini-SAS HD (x6)
C: Air Outlet / Inlet

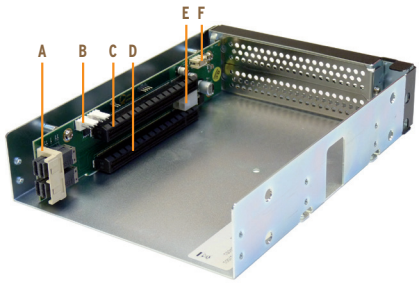
D: 3xUSB 2.0, Power, Reset, LEDs,
I2C, ext. RTC battery
E: SATA 6.0 Gb/s (x2)

(1) PCIe configuration support 8/8/4/4 or 8/4/4/4/4

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**	**Kaby lake**
COM module	COMe 3.0 Type 6	
Processor	6th Gen Intel® Core™, Intel® Xeon® E3-1500 v5 Processor	7th Gen Intel® Core™, Intel® Xeon® E3-1500 v6 Processor
Chipset	CM236 (supports ECC memory, Intel® AMT) QM170 (supports non-ECC, Intel® AMT)	CM238 (supports ECC memory, Intel AMT) QM175 (supports non-ECC, Intel AMT)
Memory	Dual channel 1867/2133 MHz DDR4 32GB max. 2xSODIMM (ECC/non-ECC support dependent on selected CPU/PCH)	Dual channel 2133/2400 MHz DDR4 32GB max. 2xSODIMM (ECC/non-ECC support dependent on selected CPU/PCH)
Video	Intel® Generation 9 LP Graphics Core, Hardware encode/transcode HD content (including HEVC) 2x DisplayPorts	
Ethernet	1 x GbE (I219LM with AMT 11.0 support)	
Disk	3x SATA 6.0 Gb/s ports	
USB	4x USB 3.0 (front panel) 3x USB 2.0 (rear panel)	
TPM	Chipset Atmel AT97SC3204 - TPM 1.2/2.0	Chipset: Infineon - TPM 2.0
Hardware Monitor	SEMA® Board Management Controller: voltage/current monitoring, power sequence debug support, AT/ATX mode control, logistics and forensic information, general purpose I2C, failsafe BIOS (dual BIOS), watchdog timer and fan control	
Environmental specifications		
Temperature	Operating : -10° ~ +55°C (*) / Storage -40° ~ +85°C *(*) extended temperature on request*	
Humidity	Operating : 5 to 90% non-condensing	
Altitude	0-3000m (0-10.000ft) operating	
Shocks (with SSD)	Operating: 25G @ 11ms / 20G @ 20ms - 6 axis (MIL STD 810 G, method. 516.6)	
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		
System Monitoring and management	Intel® AMT for remote management SEMA® Board Controller Built In Test ECRIN (Power-on BIT with Configuration checking, Continuous BIT, Maintenance BIT)	
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
	Skylake	**Kaby lake**
Xeon E5-1500 v5 / v6 **- Chipset CM236 / CM238** **- ECC memory support**	Xeon® E3-1515M v5 2.8~3.7GHz, 8MB, 45W (4C/8T, GT4e) Xeon® E3-1505M v5 2.8~3.7GHz, 8MB, 45W (4C/8T, GT2) Xeon® E3-1505L v5 2.0~2.8GHz, 8MB, 25W (4C/8T, GT2)	Xeon® E3-1505M v6 3.0/4.0GHz (Turbo), 45W (4C/8T, GT2) Xeon® E3-1505L v6 2.2/3.0GHz (Turbo), 25W (4C/8T, GT2)
Intel® Core™ Gen6 / Gen7 **- Chipset QM170 / QM175** **- non-ECC memory support**	Core™ i7-6820EQ 2.8~3.5GHz, 8MB, 45W (4C/8T, GT2) Core™ i7-6822EQ 2.0~2.8GHz, 8MB, 25W (4C/8T, GT2) Core™ i5-6440EQ 2.7~3.4GHz, 6MB, 45W (4C/4T, GT2) Core™ i5-6442EQ 1.9~2.7GHz, 6MB, 25W (4C/4T, GT2) Core™ i3-6100E 2.7GHz, 3MB, 35W (2C/4T, GT2) Core™ i3-6102E 1.9GHz, 3MB, 25W (2C/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™ i5-7442EQ 2.1~2.9GHz, 6MB, 25W (4C/4T, GT2) Core™ i3-7100E 2.9GHz, 3MB, 35W (2C/4T, GT2) Core™i3-7102E 2.1GHz, 3MB, 25W (2C/4T, GT2)

myOPALE-IO

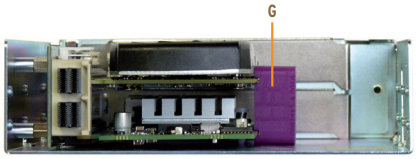
Module specifications



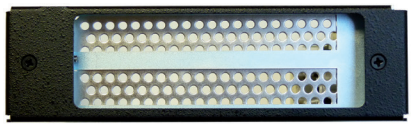
A: 8x PCIe Gen3 link(2), mini-SAS HD (x2)
B: 3x wires fan connectors (x2)
C: PCIe x4 slot (x16 mechanical) or N/A
D: PCIe x4 or PCIe x8 slot (x16 mechanical)

(2) PCIe configuration support 8/0 or 4/4

E: Power Supply (12V)
F: Remote temperature sensors



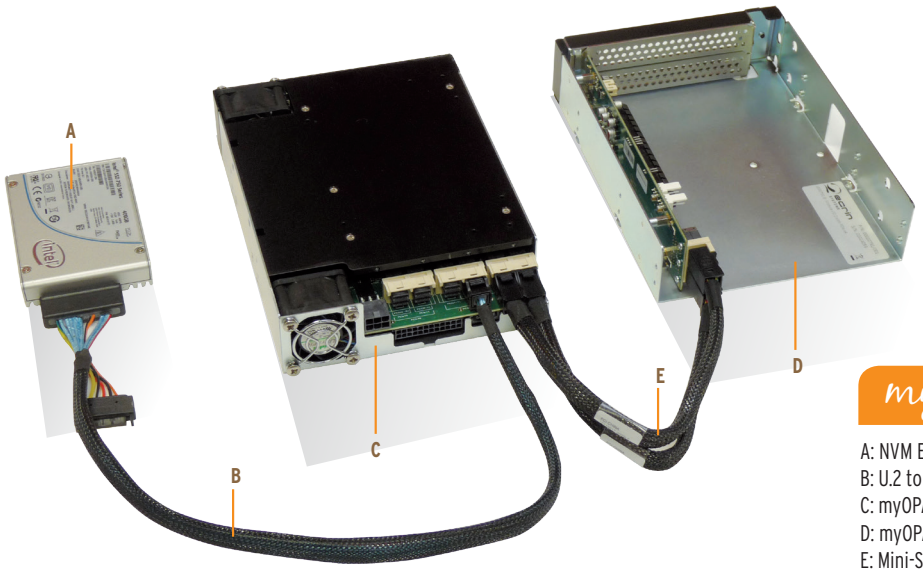
Rear panel



Front panel

G: Holding part for full height and low profile PCIe board

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	0.5 kg
Card lock	Holding part for full height and low profile PCIe board
Power Supply	+12V only
Front panel	2x full height PCIe board
Rear panel	8x PCIe Gen3 link on 2x mini-SAS HD
Carton Size (W x H x D)	220x120x270 mm
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° ~ +55°C (*) / Storage -40° ~ +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



myOPALE Concept

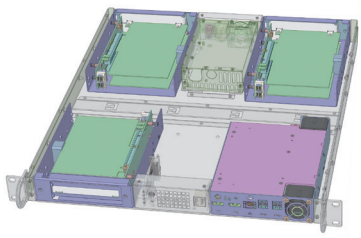
A: NVM Express SSD
B: U.2 to Mini-SAS HD cable
C: myOPALE-CPU
D: myOPALE-IO
E: Mini-SAS HD to Mini-SAS HD cable

myOPALE Use Cases

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 foot print is The Key Point: Data center, Telecom, Broadcast, Base Station Control ...



COTS solution

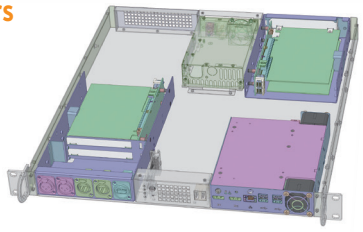
- 1U, 19'', 490mm depth
- 4x locations for 5.25'' myOPALE building blocks
- 1U power supply
- Front panel for button, LEDs, USB

› 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

Impossible with legacy Industrial PC

Customized connectors

Military, Broadcast, Telecom, Industry, Transport ...



COTS solution

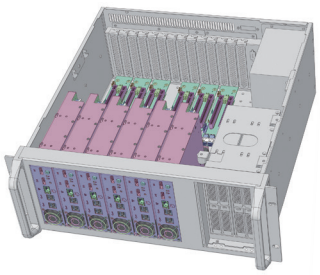
PCIe over cable mini-SAS HD connector allows to move back I/O cards in myOPALE-IO to provide custom connectors independently from myOPALE-CPU, on front or rear panel.

Will support full size and full height I/O cards on front and on rear panel.

Industrial PC full customization needed with NRC

Blade modular computer with 2 I/O slots: up to six in one 4U/19'' rackmount

Machine Learning, GPGPU's, FPGA's, Data center, Encoder/ Trancoder, NAS NVMe ...



COTS & Modified COTS solution

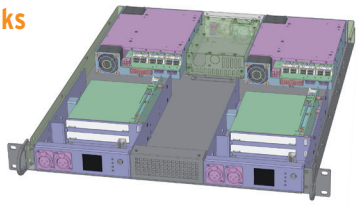
› High Density
- OPALE V2 (Modified COTS) - 4U / 19'' / 450mm depth
- Six myOPALE-CPU modules in 4U footprint
- Up to two I/O cards per Modular Computer
- Drive bay for 8x 2.5'' NVMe or SATA SSD

› 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

Impossible with legacy Industrial PC

Your Appliance based on myOPALE building blocks

Network Appliance, Telemetry, info-Com, Telecom, Broadcast...



Modified COTS solution

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

Possible with legacy Industrial PC, but higher R&D, more risky and expensive

myOPALE-IO on easier PC front access

Audio Music, NVIDIA Gamer, Broadcast, Info-Comm, Network...

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.

No equivalent on the market

PCIe x4 to mini-SAS HD converter

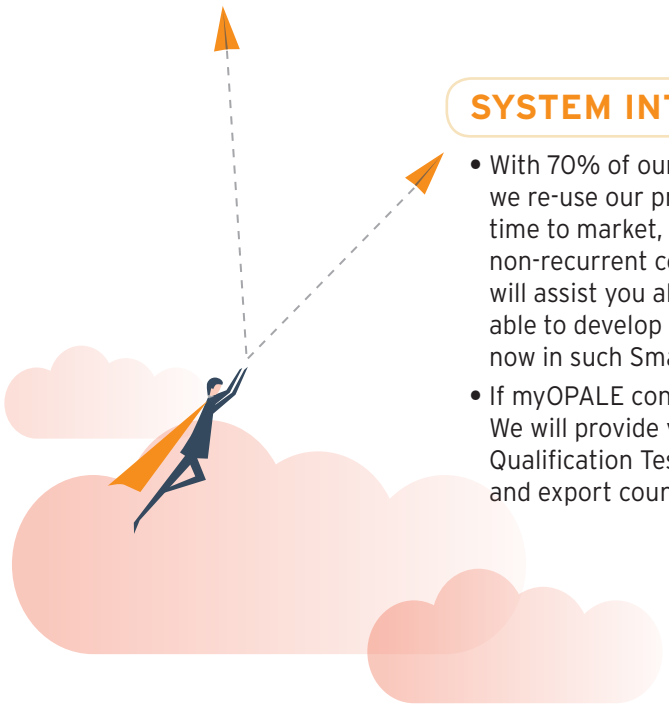
M.2 to mini-SAS HD converter

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.

PCI EXPRESS · COM Express · SNIA · nvm EXPRESS

Follow us on: YouTube · in ·

sales@ecrin.com | www.ecrin.com

Headquarters
143, rue Louis Neel
Parc Technologique du Pré Roux
38920 Crolles - France
Tel: +33 (0)4 76 92 20 01

Marketing & sales
2 - 12, rue du Chemin des Femmes
Immeuble l'Odyssée
91300 Massy - France
Tel: +33 (0)1 69 07 83 22

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