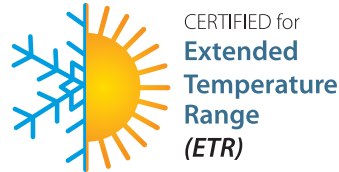


SOLUTION BRIEF

At Home in the Range

Ekinops360 Extended Temperature Range Operation

It's Nasty Out There

Severe weather is becoming a more common fact of life. Hundred-year storms and extreme temperatures are having greater effect on everything from agriculture to air travel and impacting daily life with increasing frequency.

Facts & Figures:

- The 10 warmest years on record have all occurred since 2010 with the last nine years (2014-2022) among the 10-warmest years.^[1]
- The rate of global warming since 1981 has been more than twice as fast per decade.^[2]
- Europe saw its hottest summer ever in 2022 topping the previous record set in 2021 while autumn was the third warmest on record.^[3]
- Minus 80.3°F / -62.4°C was recorded in Tongulakh, Siberia in January 2023, the all-time station record.^[4]
- In February 2023, the summit of Mount Washington in New Hampshire reported a wind-chill low of minus 108 °F/ -78 °C — the coldest temperature ever recorded in the United States.^[5]

The Challenge

Why is the temperature important for your optical network? Whether you are a service provider delivering rural broadband connectivity across kilometers of open country or densifying an urban business district with 5G radio towers and edge computing nodes, the portion of your optical transport network that lives in cabinets, huts and other unconditioned spaces is under increasing stress.

With more nodes being deployed at the edge further from the main PoP or data center and requiring more and more capacity, there is a greater need for—and dependence on—in-line equipment to connect to every endpoint and achieve the increasing span lengths. For this equipment that operates in the outside plant (OSP), the consequences of greater temperature extremes mean that it has to be equipped to function across an extended range

[1] <https://www.ncei.noaa.gov/news/global-climate-202212>

[2] Ibid

[3] <https://climate.copernicus.eu/2022-saw-record-temperatures-europe-and-across-world>

[4] <https://www.yahoo.com/news/world-coldest-air-2023-just-100003107.html>

[5] <https://www.usatoday.com/story/news/weather/2023/02/04/mount-washington-wind-chill-new-hampshire-summit-minus-108-f/11185558002/>



of conditions. This is true for both active devices like transponders and amplifiers that generate and extend the reach of optical channels as well as passive devices like filters that split and combine those channels.

Backhaul networks in particular, both for mobile and rural broadband traffic, depend heavily on equipment not located in the data center, PoP or CO. Often these unconditioned spaces are in remote areas that are difficult to access so reliability along with remote management capability are of utmost importance to avoid maintenance visits.

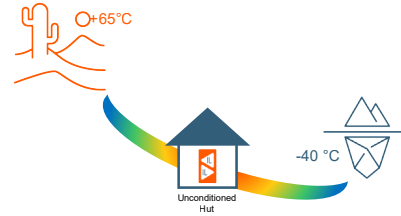


Figure 1 - Extended reach in extreme conditions

With that in mind, there are a few questions for you to consider:

- How can I scale my OSP equipment while preserving space in my outdoor cabinets?
- What type of equipment do I need—active, passive or both—and where do I place it?
- Will I be able to manage it from the NOC?
- What equipment vendors actually have what I need?
- Who can I talk to that understands what it takes to operate in extreme conditions?

At Ekinops, we have the answers.

Ekinops360 Extended Temperature Range (ETR) Solution

The Ekinops360 Extended Temperature Range (ETR) Solution provides a complete, compact solution set consisting of a shelf, commons, transponder, amplifier and a complete range of fixed filters.

All ETR components all are designed specifically for harsh environments using hardened components with an operating temperature range of -40°C to +65°C (-40°F to +149°F). They can be located at any site lacking environmental controls including cell towers, street cabinets, remote PoPs and unmanned huts.

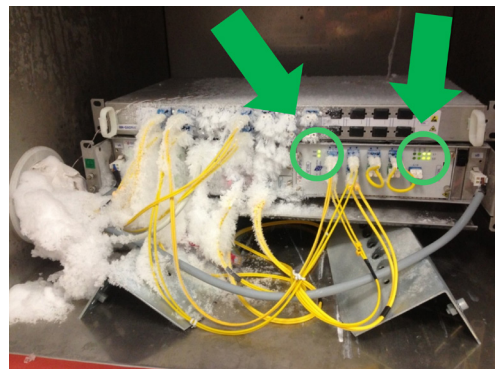


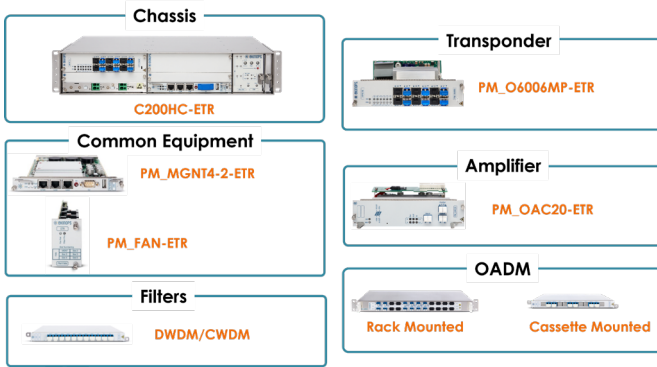
Figure 2 - Ekinops C200HC-ETR operating at -40°C (green lights indicate normal operation)

Cost & Revenue Advantages

- CapEx Savings
 - No HVAC equipment needed
 - Reduce size and requirements of cabinet
 - Reduce transponder costs by eliminating regens at intermediate locations
- OpEx Savings
 - Fewer transponders results in lower power usage
 - No HVAC power or maintenance needed
- Increased Revenue Opportunity
 - Reach remote locations to extend service areas
 - 20G backhaul capacity per 2RU shelf supports thousands of services



The Portfolio



Unit Type	Unit Name	Description
Chassis	C200HC-ETR	2RU shelf; includes hardened fan unit and management card
Transponder	PM_O6006MP-ETR	3x10G multiprotocol OTN transponder
Amplifier	PM_OAC20-ETR	Dynamic gain range; variable output power; supports 64, and 80- channel designs
Filters	<ul style="list-style-type: none"> MUX/DEMUX: CM_OM-ETR OADM: CM_OADM-ETR 	Full C-band; DWDM or CWDM; dual sided or single-sided; dual fiber or single fiber

Figure 3 - Ekinops ETR hardware

Conclusion

The need for highly reliable and fully functional transport equipment that can operate in harsh environments is growing as distribution networks expand in size and scope and the climate continues to change around us. Ekinops provides a full ETR-certified solution consisting of both active and passive networking components capable of normal operation even in temperature extremes stretching from -40°C to +65°C.

Ekinops has deployed its hardened solutions in hundreds of networks around the world so if you are looking for an experienced partner that can take the heat—and the cold—we are here for you.

About Ekinops

Ekinops is a leading provider of open, trusted and innovative network connectivity solutions to service providers around the world. Our programmable and highly scalable solutions enable the fast, flexible, and cost-effective deployment of new services for both high-speed, high-capacity optical transport as well as virtualization-enabled managed enterprise services.

Our product portfolio consists of three highly complementary product and service sets: Ekinops360, OneAccess and Compose.

Ekinops360 *Dynamic Optical Transport*

- Ekinops360 provides optical transport solutions for metro, regional and long-distance networks with WDM for high-capacity point-to-point, ring, and optical mesh architectures, and OTN for improved bandwidth utilization and efficient multi-service aggregation.

ONEACCESS *Fast Network Virtualization*

- OneAccess offers a wide choice of physical and virtualized deployment options for Layer 2 and Layer 3 access network functions.

COMPOSE

- Compose supports service providers in making their networks software-defined with a variety of software management tools and services, including the scalable SD-WAN Xpress and SixSq Edge-to-Cloud solutions.

As service providers embrace SDN and NFV deployment models, Ekinops enables future-proofed deployment today, enabling operators to seamlessly migrate to an open, virtualized delivery model at a time of their choosing.

A global organization, Ekinops (EKI) - a public company traded on the Euronext Paris exchange operates on four continents.

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