

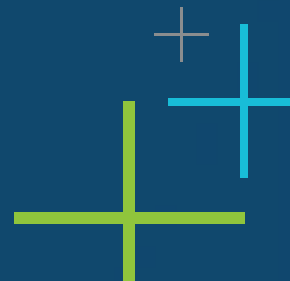


PIONEERING
NEW MOBILITY



DATA RECORDING TOOLS

Efficient Setup for your Test Carrier





+ ADAS/AD Validation Toolbox for Data Driven Development

Hardware and software tools for the ideal data set from recording to replay - all from one source!



Our AD Validation Toolbox offers a comprehensive range of tools to improve your data-driven development processes and the validation of their functions and sensors. Our powerful hardware and software components work together seamlessly, resulting in efficient and accurate data collection, distribution and processing.

Our scalable hardware solutions cover every application-from simple recording setups to multi-I/O setups to deep learning and AI platforms. With a wide range of flexible add-ons for additional interfaces and a variety of powerful storage solutions, you can configure any solution to meet your needs. Our modular measurement platforms and powerful storage solutions help you develop and validate complex systems.

With software solutions for data recording and processing, data encryption methods, time synchronization services and optimum interface know-how, we enable reliable solutions for your development. This allows us to provide customized reliable data acquisition for accurate analysis.

Our data management tools offer powerful features to gain deeper insights into the collected data. The over-the-air software updates allow the system to be flashed remotely, and the storage logistics management optimizes the use and availability of the test vehicles by preventing possible storage failures or trips with full storage.

With our AD Validation Toolbox, we offer you all measurement technology system components - from the sensor to the cloud. All components work together seamlessly and smoothly to make the path to your development as easy as possible.

+ What We Offer for Your In-Vehicle Recording Application

At the center of the development, testing and validation of automated and autonomous systems, b-plus is your expert for the development of hardware, software components and integrated complete solutions. Our approach is based on a modular, robust and reliable product range, complemented by the development of customized solutions for our customers. By intelligently combining our modules and services, we enable the quick implementation of scalable and future-proof systems.



Robustness for demanding environments

Our hardware is specially designed for use in extreme conditions, whether in the vehicle or in challenging environments. It can withstand high humidity, dust loads, shocks and vibrations as well as changing temperature conditions.

In order to put the robustness of our hardware to the test, the products are attached to shaking and vibrating plates in the laboratory and put through their paces. In addition, thanks to efficient cooling technologies, our products reliably ensure even heat distribution in the setup and prevent components from overheating.



Modularity throughout the whole system

Our hardware and software components are precisely coordinated to ensure smooth integration and maximum efficiency in your measurement technology setup. Thanks to the option of individually expanding our systems with additional add-ons and storage solutions, we guarantee perfect adaptation to your specific requirements. This ensures that your investment not only meets the latest technology standards, but also remains future-oriented.



Everything from one source

b-plus presents you with a wide range of solutions covering all aspects - from hardware and software to comprehensive system configurations. Our portfolio ranges from simple media converters to versatile multi-I/O recording systems and complex test environments. Save yourself the headache of getting different components to work - we ensure smooth integration and guarantee the optimal functioning of your overall system.

+ BRICK

Data Recorder

Powerful measurement platform for driver assistance systems and autonomous driving



The BRICK measurement platform was developed specifically for the acquisition of raw data from sensors and ECUs during test drives. BRICK is a powerful platform for very flexible adaptation and integration into the development and validation systems of sensors and ECUs. Due to its optimized architecture, the measurement technology platform opens up a wide range of validation applications.

BRICKplus

Processor and Main Memory	Intel® Core™ i7-6820EQ 32 GB RAM DDR4-2133 128 GB internal M.2 SSD
Ethernet	2x 10GBase-T Ethernet (g)PTP 5x 1000Base-T Ethernet (g)PTP 1x 1000Base-T Ethernet
USB	4x USB3.1 Gen1 Host
Operating Temp	closed finned heat sink -25 °C to +70 °C



BRICK2

Processor and Main Memory	Hexa Intel® Core™ i7-9850HE 64 GB RAM DDR4-2666 512 GB internal M.2 SSD
Ethernet	6x 10GBase-T Ethernet (g)PTP 3x 1000Base-T Ethernet (g)PTP 1x 1000Base-T Ethernet
USB	4x USB3.1 Gen1 4x USB A 2.0
Operating Temp	closed finned heat sink -20 °C to +60 °C



+ xSTORAGE

Removable Storage Unit

Powerful storage with sliding mechanism for easy data handling



The xSTORAGE is a removable logging storage system for BRICK and DATAlynx measurement and recording systems and ensures fast, efficient and secure data handling. The focus of the xSTORAGEs is on user-friendliness, emphasized by a simple sliding mechanism that makes inserting and removing the storage unit uncomplicated. The hot-plug and hot-swap capabilities enable uninterrupted data exchange.

BRICK STORAGEplus

PCI Express 3.0 x4 SATA RAID 8 x SATA SSD 8/16/32 TB 16 Gbit/s @ATX4 / @BRICK2



BRICK2 STORAGE

PCI Express 3.0 x8 SATA RAID 8 x SATA SSD 8/16/32 TB 24 Gbit/s @ATX4 / @BRICK2



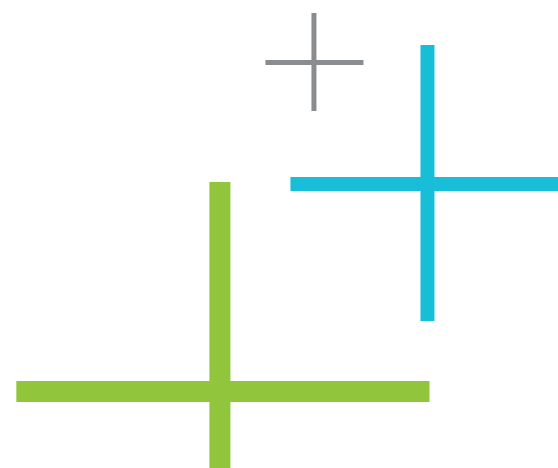
BRICK2 STORAGE NVMe

PCI Express 3.0 x8 NVMe JBoF 8 x E1.S NVMe SSD 15/30/60 TB 48 Gbit/s @ATX4 32 Gbit/s @BRICK2



x8 STORAGE Gen4 E1.S

PCIe 4.0 x8 NVMe RAID 8 x E1.S NVMe SSD 15/30/60 TB 96 Gbit/s @ATX4 PCIe4 48 Gbit/s @ATX4 PCIe3 32 Gbit/s @BRICK2



+ BRICK Add-Ons

Expansion Options

Customize your BRICK system according to your individual requirements or use case



BRICK Add-Ons elevate the BRICK measurement platform, transforming it into an even more powerful and flexible tool for data acquisition. With options for enhanced connectivity, expanded networking, increased processing capabilities or advanced graphics processing, these modules tailor the platform to fit the unique demands of your project.

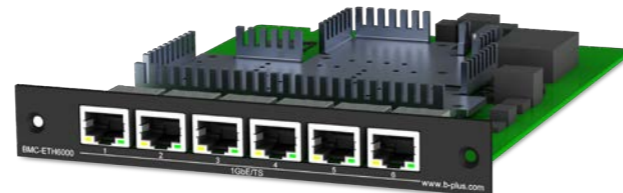
Add-On BMC VB2

Measurement Card
8x CAN-FD or
4x CAN-FD and 2x FR



Add-On BMC ETH6000

Measurement Card
6x 1000Base-T Ethernet (g)PTP, PoE



Add-On SPC

2 x8-PCIe 3.0 Slot Cards
60 W max



Add-On PCIe GPU

NVIDIA® RTX3060 GPU
3584 CUDA core
12 GB GDDR6
12,9 TFLOPs (FP32)

2 x4 PCIe 3.0 Slot Cards
60 W max



How Cutting-Edge Measurement Technology Platforms are Transforming Raw Data Recording

The measurement platform BRICK was specially developed for the recording of raw data with high bandwidth from sensors and ECUs during test drives. It is particularly convincing due to its high interface diversity, high data throughput and a consistently open system concept. From high-performance hardware to the appropriate software – we offer the right, coordinated components for your individual recording application – all from one source from b-plus.

The BRICK product line, including models such as BRICKplus, BRICK2, and BRICK25, is built on a flexible modular foundation. This structure supports a wide range of enhancements and storage solutions, allowing users to customize their setups based on distinct needs and operational scenarios. This modularity ensures that clients receive not just a product but a tailored solution offering additional adaptability through various add-ons. For instance, the SPC add-on accommodates PCIe cards, while the BMC add-on introduces compatibility with advanced communication protocols like CAN-FD or FlexRay. The compatibility across the BRICK system's modules secures a future-proof investment for users, ensuring that the technology will remain relevant and adaptable to evolving requirements. The platform's open architecture facilitates seamless integration with other AVETO components, proprietary software, and even solutions from third parties.

The compact rack design of the BRICK system is a significant advantage, particularly for the installation of complete ADAS (Advanced Driver-Assistance Systems) solutions within vehicles. This design minimizes the need for excessive installation space and extensive cabling, making it an ideal choice for environments where space is at a premium. Furthermore, its robust construction is specifically tailored to withstand the rigors of harsh environmental conditions, ensuring reliability and durability even under challenging circumstances.

Especially in the ADAS/AD area, an exactly time-synchronous recording of data is necessary. All BRICKs support completely synchronous recording of raw and bus data thanks to the Time Synchronization Software XTSS from b-plus. The BRICK is synchronized both internally via the hardware and externally via Ethernet interfaces. With XTSS you get a precise time correlation of the data packets of your connected sensors. This level of precision is crucial for the accurate analysis and interpretation of sensor information, which, in turn, is essential for the development and refinement of ADAS/AD technologies.



BRICKplus

BRICK2

BRICK25



+ DATAlynx

19" Vehicle Server

Powerful high performance computer for use in the automotive area



The DATAlynx ATX series is a high-performance computing solution that achieves the next level for in-vehicle applications. With a completely new designed power supply and an extremely powerful and fully integrated liquid cooling setup the device enables maximum CPU and GPU performance. Thanks to its high-quality components and robust construction, it is ideally suited for use in demanding vehicle environments.

Generation EP3

Processor and Main Memory
AMD EPYC™ 7003
Supermicro H12SSL-i
8x 8-64GB DDR4-3200

Interfaces
2x 1000Base-T Ethernet
5x PCIe 4.0 x16
2x PCIe 4.0 x8

USB
6x USB 3.0

Operating Temp
liquid cooled
(DC) -10 °C to +60 °C
(AC) 0 °C to +40 °C



Generation SX2

Processor and Main Memory
2nd Gen Intel® Xeon® Scalable
Supermicro X11DPH-T
12x 8-64GB DDR4-2933

Interfaces
2x 10GBase-T Ethernet
3x PCIe 3.0 x16
4x PCIe 3.0 x8

USB
6x USB 3.0

Operating Temp
liquid cooled
(DC) -10 °C to +60 °C
(AC) 0 °C to +40 °C



+ xSTORAGE

Removable Storage Unit

Powerful storage with sliding mechanism for easy data handling



The xSTORAGE is a removable logging storage system for BRICK and DATAlynx measurement and recording systems and ensures fast, efficient and secure data handling. The focus of the xSTORAGEs is on user-friendliness, emphasized by a simple sliding mechanism that makes inserting and removing the storage unit uncomplicated. The hot-plug and hot-swap capabilities enable uninterrupted data exchange.

BRICK STORAGEplus

PCI Express 3.0 x4 SATA RAID
8 x SATA SSD

8/16/32 TB
16 Gbit/s @ATX4 / @BRICK2



BRICK2 STORAGE

PCI Express 3.0 x8 SATA RAID
8 x SATA SSD

8/16/32 TB
24 Gbit/s @ATX4 / @BRICK2



BRICK2 STORAGE NVMe

PCI Express 3.0 x8 NVMe JBof
8 x E1.S NVMe SSD

15/30/60 TB
48 Gbit/s @ATX4 | 32 Gbit/s @BRICK2



x8 STORAGE Gen4 E1.S

PCIe 4.0 x8 NVMe RAID
8 x E1.S NVMe SSD

15/30/60 TB
96 Gbit/s @ATX4 PCIe4 | 48 Gbit/s @ATX4 PCIe3
32 Gbit/s @BRICK2



+ DATAlynx Add-Ons

Expansion Options

Customize your DATAlynx system according to your individual requirements or use case



BRICK Add-Ons elevate the BRICK measurement platform, transforming it into an even more powerful and flexible tool for data acquisition. With options for enhanced connectivity, expanded networking, increased processing capabilities or advanced graphics processing, these modules tailor the platform to fit the unique demands of your project.

Add-On GPU

Add-On (top)

PCIe 5.0 x16 interface
for high power graphics >300W

integrated liquid cooling
850W extra DC Power Supply



Add-On B2S

Add-On (bottom) for two xSTORAGE slots

actively cooled
includes a PCIe 3.0/4.0 switch
µC based FAN control and power management

Supports:
xSTORAGE Hot-Swap and Hot-Plug



Add-On PCIe

Add-On (bottom) for PCIe extension cards

actively cooled
µC based FAN control

Possible slot configurations:
Without PCIe Switch: 4x4 / 2x8 / 4x8 / 2x16

Optional:
With PCIe Switch: 4x8 / 2x16
Extra 500W DC or 750W AC Power Supply
802.1AS Extension



Using High-Performance Computers to Optimize ADAS Data Acquisition for Efficient Validation

In the ever-evolving field of advanced driver assistance systems (ADAS) and autonomous vehicles, efficient data acquisition is the key to success. With this issue of b-plus news, you will experience how our High-Performance Computers (HPC) are revolutionizing raw data acquisition and setting the stage for unprecedented validation.

Powerful Hardware

HPCs are equipped with particularly powerful hardware that enables high computing performance. This includes fast processors, large amounts of RAM and powerful graphics cards. They enable the system to deliver massive AI computing power for intelligent measurement and recording applications.

Efficient Data Storage

HPCs have fast and efficient data storage solutions that enable fast access to large amounts of data. Suitable storage solutions, which are optimally matched to the hardware, are an absolute must for successful data handling. Our recording platforms are all designed for modularity and expandability, so that all components can work hand in hand across different systems.

Scalability

To handle even more demanding tasks, HPCs can be expanded by adding further resources, such as additional PCIe slots, measurement cards, various storage solutions or other add-ons. This not only increases the performance of the systems, but also makes them a future-proof investment because of the flexibility. Scale your setup from entry-level to advanced multi-I/O recording or a Deep Learning and AI platform.

High Power Efficiency

Since HPCs can consume a lot of energy, they are often combined with efficient cooling systems to ensure that the heat from components with a high power consumption, e.g. the CPU, is dissipated quickly enough so that they do not overheat. This is especially important when used in vehicles. Our high-performance solutions are based on both air cooling and liquid cooling.

Ruggedized Hardware

In-vehicle setups are often exposed to harsh environmental conditions. One of them being extreme temperature variations, from freezing cold to scorching heat. Ruggedized hardware is equipped with thermal management systems to maintain consistent performance across all extended temperature ranges. Furthermore, measurement setups can experience significant vibrations and shocks while in operation. Our hardware is built with sturdy components and vibration-absorbing mechanisms to prevent damage and always ensure data accuracy.

Specialized Software

The software is responsible for the control, analysis, and management of the collected data. It provides the ability to visualize, process and evaluate the collected measurement data in real time. With software that does not work seamlessly with the hardware components, it can be difficult to take full advantage of the collected data and gain the desired insights. HPCs therefore often use specially developed software that is optimized for parallel processing and hardware utilization.

+ COPYLynx

Data Copy Station

For data ingestion into the data center or the cloud



To facilitate the handling of very large storage data, b-plus offers a data copy station, which was specially designed for the b-plus STORAGE units. This copy station is used for the transfer of multi-sensor data to data centers or the cloud. To ensure utmost data integrity, sophisticated hash algorithms as well as a powerful CPU have been integrated.

COPYLynx ATX4 Gen3

CPU Platform	AMD Epyc™ 7003, 24 Core CPU 64GB DDR4 memory, Linux OS
xSTORAGE Support	4x STORAGE slot, PCIe 3.0 x8
PCIe x8 STORAGE	BRICK2 STORAGE / BRICK2 STORAGE NVMe
PCIe x4 STORAGE	BRICK STORAGE / BRICK STORAGEplus
LAN Source/Target	2x 1GbE 4x 10GbE 2x 100G QSFP56
USB Source/Target	6x USB 3.0



COPYLynx ATX4 Gen4

CPU Platform	AMD Epyc™ 7003, 64 Core CPU 128GB DDR4 memory, Linux OS
xSTORAGE Support	6x STORAGE slot, PCIe 4.0 x8
PCIe x8 STORAGE	x8 STORAGE - Gen4 E1.S BRICK2 STORAGE / BRICK2 STORAGE NVMe
PCIe x4 STORAGE	BRICK STORAGE / BRICK STORAGEplus
LAN Source/Target	2x 1GbE 4x 10GbE, 4x 10G SFP+ 4x 100G QSFP56
USB Source/Target	6x USB 3.0



+ NETLion

Automotive Ethernet Tool

Development tool with speeds of 100BASE to 10GBASE



Whether for software and hardware development at the ECU, measuring data in the vehicle, analyzing data streams in the lab or flashing ECUs – the Automotive Ethernet TAP and media converter NETLion offers the optimal solution for each of your requirements. It connects the world of automotive Ethernet with that of standard Ethernet, making it an indispensable tool in development.

NETLion 1000

Automotive Ethernet	2x 100BASE-T1/1000BASE-T1 IEEE 802.3bw / 802.3bp
Standard Ethernet	2x 100BASE-TX/1000BASE-T IEEE 802.3 Clause 40
Hardware Technology	Ethernet Layer 1
Operating Modes	Network TAP (Test Access Point) Dual Media Converter Cable Tester
Operating Temp	-40 °C to +75 °C
Supply Voltage	9 - 48 V



NETLion 10G

Automotive Ethernet	2x 2.5/5/10GBASE-T1 IEEE 802.3ch
Standard Ethernet	2x 2.5/5/10GBASE-T1 IEEE 802.3an / 802.3bz
Hardware Technology	Ethernet Layer 1
Operating Modes	Network TAP (Test Access Point) Dual Media Converter
Operating Temp	-25 °C to +75 °C
Supply Voltage	9 - 32 V



+ MDILink

Measurement Data Interface

SerDes measurement data converter for decoupling of raw sensor data



In the ADAS/AD area, measurement data converters are used when you want to decouple raw data from sensors, such as cameras, radars or lidars. With the MDILink you get a SerDes measurement data converter, enabling a smooth transition from the development stage to series production. The sensor data can be analyzed in measurement platforms and integrated into other modules of the b-plus Automotive Toolbox.

MDILink GMSL2 TAP

2x GMSL2 Input (RX) MAX96716 Deserializer
2x GMSL2 Output (TX) MAX96717 Serializer
2x 10 GbE Dataport | 1x 1 GbE Mgmt Port
Timesync IEEE 1588-2008
Protocol ASAM CMP
Power Supply 8 - 32 V



MDILink GMSL2 4EP

4x GMSL2 Input (RX) MAX96716 Deserializer
2x 10 GbE Dataport | 1x 1 GbE Mgmt Port
Timesync IEEE 1588-2008
Protocol ASAM CMP
Power Supply 8 - 32 V



MDILink FPD-Link III

2x FPD III Input (RX) DS90UB954-Q1 Deserializer
2x FPD III Output (TX) DS90UB953-Q1 Serializer
2x 10 GbE Dataport | 1x 1 GbE Mgmt Port
Timesync IEEE 1588-2008
Protocol ASAM CMP
Power Supply 8 - 32 V



MDILink CSI-2

2x CSI-2 Input (Rx) Deserializer
2x CSI-2 Output (Tx) Serializer
2x 10 GbE Dataport | 1x 1 GbE Mgmt Port
Timesync IEEE 1588-2008
Protocol ASAM CMP
Power Supply 8 - 32 V



Custom-Fit Precision with MDILink: „Out of the Box“ Is Not Always the Right Solution.

With our MDI (Measurement data interface) technology we specialize in decentralized measurement data acquisition from sensors, the conversion and exact time stamping of data from synchronized clocks, and the subsequent transfer via Ethernet to the recorder. Our technology is used in the development process of ECUs, for automated and autonomous driving, in prototypes and tests for data acquisition.

Broad-based

Out-of-the-box, MDILink is equipped with industry-standard interfaces such as GMSL2, FPD-Link III, and CSI-2 to cater to a broad spectrum of applications. However, the true value of MDILink lies in its outstanding customization options. Depending on the specific use case, MDILink can be tailored to meet unique requirements, ensuring seamless integration with any ECU and sensor setup.

Efficient

At the heart of the MDILink's customization capabilities is its use of advanced FPGA technology, which facilitates highly efficient and parallel processing of various interfaces at highest data rates.

Adaptable

Integration with existing tool chains is smooth thanks to well-defined software interfaces, making MDILink a versatile and open solution that can adapt to a wide array of software frameworks. This interoperability is key for developers looking to incorporate the MDILink into their existing systems without the need for extensive modifications.

Customizable

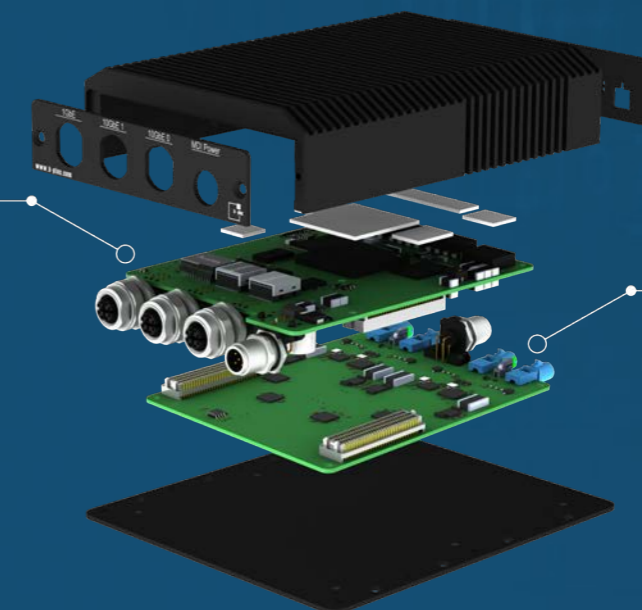
Furthermore, our MDILink can be customized to support unique interfaces, accommodate various data formats for input and output, and apply specific data compression, conversion, and encryption techniques. This high degree of adaptability ensures that MDILink can be fine-tuned to align with the precise demands of any project, offering a personalized solution that off-the-shelf products simply cannot match.

Integer

Whether it is for handling complex sensor arrays or ensuring data integrity in the most challenging of automotive applications, MDILink proves our commitment to flexible, tailored solutions in state-of-the-art technology.

Base Board

SoC
Time Sync
FPGA IP Blocks
Data Processing



IO Board

ECU Integration
Sensor Frontend Interface
I²C backchannel communication

+ xDSwitch SN2000

Managed Ethernet Switch

Switch suitable for use in mobile applications or data centers



With our xDSwitches of the SN2000 line we offer highest Ethernet switching capacity and transmission bandwidths for use in high-end ADAS/AD validation setups, as well as in classic data center IT applications. Regardless of your specific setup, our xDSwitches SN2000 ensure seamless and reliable communication between the various components in your respective application area.

MDSwitch SN2010

Suitable for	test carrier operation
SFP28	18x 25 Gbit/s
QSFP28	4x 100 Gbit/s
USB	1x USB 2.0
Max Throughput	1,7 Tb/s 1,26 Billion packets per second



MDSwitch SN2100

Suitable for	test carrier operation
SFP28	-
QSFP28	16x 100 Gbit/s
USB	1x Mini USB 2.0
Max Throughput	3,2 Tb/s 2,38 Billion packets per second



EDSwitch SN2010

Suitable for	data center operation
SFP28	18x 25 Gbit/s
QSFP28	4x 100 Gbit/s
USB	1x USB 2.0
Max Throughput	1,7 Tb/s 1,26 Billion packets per second



EDSwitch SN2100

Suitable for	data center operation
SFP28	-
QSFP28	16x 100 Gbit/s
USB	1x Mini USB 2.0
Max Throughput	3,2 Tb/s 2,38 Billion packets per second



+ EDSwitch 10G

Managed Ethernet Switch

Switch suitable for use in mobile applications with or without PoE support



The high flexible EDSwitch 10G series offers different versions with or without PoE support to match your specific needs. The 12 or 20 port versions of the device provide 4x 1/10 Gigabit Ethernet SFP+ uplinks and result in a cost-effective and reliable industrial solution where high-throughput and high-reliability is fundamental.

EDSwitch 10G 12-Port

Switching Fabric	128 Gbit/s non blocking
RJ45	8x 1 Gbit/s
SFP	-
SFP+	4x 10 Gbit/s
Operating Temp	-40 °C to +70 °C
PoE Support	optional



EDSwitch 10G 20-Port

Switching Fabric	128 Gbit/s non blocking
RJ45	16x 1 Gbit/s
SFP	-
SFP+	4x 10 Gbit/s
Operating Temp	-40 °C to +70 °C
PoE Support	optional



EDSwitch 10G 20-Port

Switching Fabric	128 Gbit/s non blocking
RJ45	12x 1 Gbit/s
SFP	4x 1 Gbit/s
SFP+	4x 10 Gbit/s
Operating Temp	-40 °C to +70 °C
PoE Support	optional



+ (g)PTP Solution QX550

PCIe-based Retrofit Solution

For high-precision time synchronization



The QX550 is a network card for PCIe slots with four 10GBASE-T interfaces. The Platform Sync Board (PSB) is used to synchronize the computer's clock with other devices. It also includes a GPS module and interfaces for synchronization with external devices. The PSB does not require a dedicated PCIe slot and is powered by the QX550 Master via a cable connection.

Network Card QX550 Master/Slave

PC Interface	PCIe 3.0 x8
Ethernet Interfaces	4x 10GBase-T
PPS Distribution	QX550 Master: 3x internal QX550 Slave: none
Power Consumption	25 W
Operating Temp	-10°C ~ +60°C
Cooling	Active, with FAN control



Platform Sync Board PSB

PC Interface	OCuLink x4 cable to QX550 Master
Ethernet Interfaces	1x 1000BASE-T Master/Slave
PPS Distribution	1x external (PPS-out)
Power Consumption	5 W
Operating Temp	-10°C ~ +60°C
Cooling	Passive



With our **passion** for innovative and technological solutions, we are shaping the **safe automation** of the **mobile future**.



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