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BIG9000 Series

Intelligent Unidirectional Gateway

BlackBear
Cyber Security

Cyber Security at OSI Layer-1 for your asset

Avoid down-time and protect critical equipment by establishing unidirectional communication at OSI Layer 1.

BIG9000 is a unidirectional communication and data transfer gateway that secures your critical operation assets across the Layer-1 network. Its security design prevents data leakage and eliminates cyber threats by enforcing one-way data transfer at the physical layer. BIG9000 integrates packet inspection for both horizontal and vertical communication, and only allows valid content in Layer 3 to Layer 7 to pass through.

Decades of experience in power distribution networking, manufacturing plants, and oil & gas helped us to tailor our solutions for the strict requirements driven by power generation and distribution grids. We offer the most advanced protection to one of the most critical infrastructures for your business, for the economy, and even for social stability.

A rugged unidirectional gateway

Rugged, fanless, wide-temperature, well-protected design: BIG9000 is EN61000-6-2, EN61000-6-4, IEC/EN/UL62368-1:2014, and FCC certified. With a -40 to +70°C operating temperature, it withstands the harshest environments, as well as the most demanding EMC interferences. The high performance solution comes in a compact design that integrates seamlessly with users' operational environments.

No door, no vulnerability

A Unidirectional Gateway is a hardware device placed between two networks of different security levels, and controls the flow of information to move in one way only. Utilizing physical layer 1 isolation, it makes sending data from an unsecure site to a secure site impossible.

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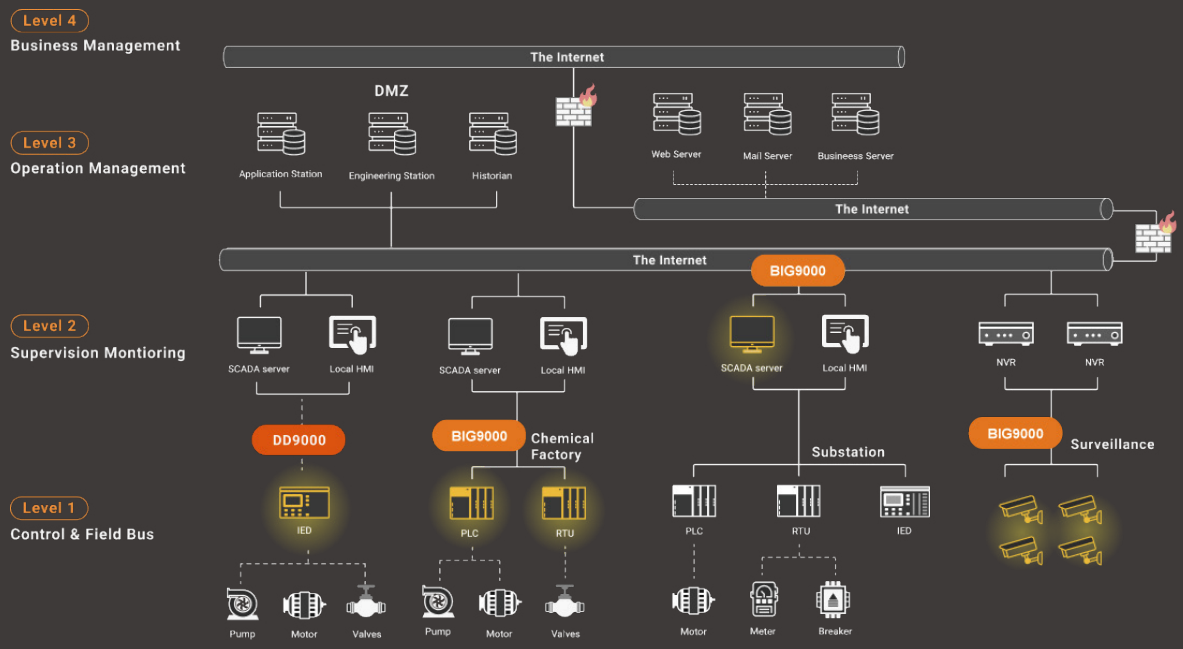
Deployment



Data Diode

BIG9000 includes server/client protocol proxies for both polling-oriented and event-oriented protocols, providing the extra intelligence needed for an effective unidirectional communication, while preserving a physical separation between the Industrial Automation Control System and the IT/Enterprise network.

No malware can be introduced to the OT side, simply because there is no return physical path and no end-to-end TCP/IP available.

Last-Mile Security

In order to prevent eavesdropping on the last-mile communication between BIG9000 and the upper layers, we enable MACsec technology to encrypt the outgoing data-flow, placing an additional layer of security.

Secure Data Transmission

A Unidirectional Gateway is a hardware device placed between two networks of different security levels, for example OT and IT, and controls the flow of information to move in one way only. Through physical layer 1 isolation, data transfer from an unsecured site to a secure site becomes impossible.

Pursuing a zero-trust approach, BlackBear solutions not only enforce unidirectional communication using an FPGA-based Data Diode, but also perform FPGA-based packet inspection, all at wire speed. Additional features like MACsec, horizontal protection and reverse channels are available for a tailored solution that meets your specific needs.

The goal: deliver pre-validated, non-corrupted information to the other side, avoid the risk of malware spreading from the IACS to upper levels, and generate alarms for ongoing threats.

Reverse Diode

As an option, and only if necessary, a reverse diode receives specific commands from the IT side, validates them, and recreates them on the other side, destroying the original. This way, basic triggers can be sent down to the Industrial Automation Control System from the SCADA or the monitoring channel, and the air-gap physical separation between the two networks are still preserved, blocking any attempt of intrusion, penetration, or malware injection.

Packet Inspection and Horizontal / Vertical Secure Communication

With FPGA-based solutions, our technology not only guarantees physical separation on the reverse channel, but also provides Layer 3 to Layer 7 packet inspection on vertical and horizontal communications in the FPGA hardware, securing it against firewall bypass attempts.

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Added value, delivered

We protect from outside dangers

We protect assets, subnets, or systems from any cyber attack or ransomware originated upstream, no matter if it's your IT, the Internet or Cloud.

We inform you when something's wrong

Our patented technology not only blocks threats through the FPGA, but also forwards complete invalid packets to your SOC (secure operation center) for analysis.

We protect from new threats

Leveraging our Zero-Trust approach, our technology protects you against all those viruses, ransomware, or threats that do not exist yet, without any need to update.

We deliver last-mile security

By supporting robust MACsec encryption, we add an additional layer of last-mile security to all communications originating from our solutions upstream.

Technical Specifications

Environment limits

Operation temperature:
-40°C to +70°C (-40°F to +158°F)
Storage temperature:
-40°C to +85°C (-40°F to +185°F)
Ambient relative humidity:
5% to 95% (non-condensing @55°C)

Power management

Input voltage: 9-57VDC
(802.3af: 45-57V, 802.3at: 51-57V)
Input current: 5.5 A max.
(802.3af: 3.5A Max., 802.3at: 5.5A Max.)
Connector: Removable 5-pin terminal block
Power redundancy: Yes
Reverse polarity protection: Yes

Physical characteristics

Housing: Metal, IP30 protection
Dimensions (W x H x D): 200*160*102 mm
Weight: 2.5kg
Installation: DIN-Rail, wall mount

Technology

Data diode: FPGA-based with packet inspection
Protocols proxy: Integrated on server/client

Ethernet port:

OT side: 8 x 1Gbps RJ45 (PoE module is available)
IT side: 1 x 1Gbps RJ45 (2x in MACsec version)

Protocols support

Substation: DNP3.0, IEC60870-5-104, IEC61850
Industrial: Modbus TCP, OPCUA, MQTT
File transfer: SFTP, FTP, TCP raw data
Management: Syslog
Reversed Command: DNP3.0, IEC60870-5-104, IEC61850, Modbus TCP
Video: RTSP, ONVIF

Approvals

Safety: UL/IEC(CB)62368-1
Security: Achilles Communication Certificated Lv2, IEC 62443-4-1
Penetration test validated by: CHTsecurity(TW), III(TW), STH(TH), Flatt(JP), NECTEC(TH)
FCC: Part 15, Subpart B, Class A
CE (EMI): EN55032, EN61000-3-2, EN61000-3-3, EN61000-6-4
CE (EMS): EN55024, EN61000-6-2, IEC61000-4-2/3/4/5/6/8/11
Shock: MIL-STD-810F Method 516.5
Drop: MIL-STD-810F Method 516.5
Vibration: MIL-STD-810F Method 514.5 C-1 & C-2
RoHS: Yes
MTBF: 415,681.88 hrs / 47.45 years (25°C)
Warranty: 5 years

Ordering Information

BIG9000I: Intelligent Unidirectional Gateway with switch function
BIG9000I-8PoE: Intelligent Unidirectional Gateway with switch function, 8 PoE ports
BIG9000I-2MAC: Intelligent Unidirectional Gateway with switch function and MACsec
BIG9000I-8PoE-2MAC: Intelligent Unidirectional Gateway with switch function and MACsec, 8 PoE ports
BIG9000I-Rev: Intelligent Reverse Diode with MACsec

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