

# BIG9000I

## BLACKBEAR INTELLIGENT GATEWAY

### Description



#### Cyber Security at OSI Layer-1 for your asset

Avoid down-time and protect critical equipment by establishing unidirectional communication at OSI Layer 1. BIG9000I 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. BIG9000I 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: BIG9000I 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.

#### Data Diode

BIG9000I 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.

PROTECTION  
FROM OUTSIDE  
DANGERS

INFORMATION  
WHEN  
SOMETHING'S  
WRONG

PROTECTION  
FROM NEW  
THREATS

DELIVERY  
LAST-MILE  
SECURITY

### 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

Pursuing a zero-trust approach, BIG9000 not only enforces unidirectional communication through its FPGA-based Data Diode, but also performs FPGA-based packet inspection, all at wire speed. 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.

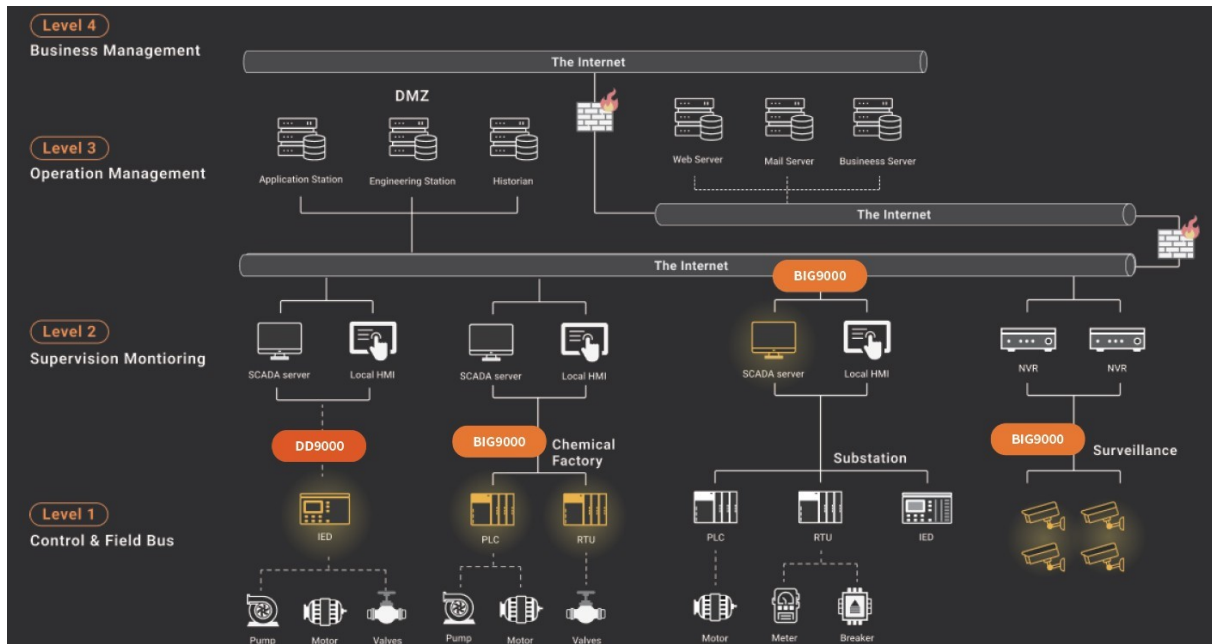
### Reverse Diode

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

## Deployment



## 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%, 55°C (non-condensing)
Power management	
Input voltage	9-57VDC(802.3af: 45-57V, 802.3at: 51-57V)
Input current	3.3A max. (802.3af: 3.5A Max., 802.3at: 5.5A Max.)
Connector	Removable 5-pin terminal block
Power redundancy	Yes
Reverse polarity protection	Present
Physical Characteristics	
Housing	IP30 Protection, Metal housing
Dimension (W x H x D)	200 x 160 x 102 mm
Weight	2.5Kg
Installation	DIN-Rail, Wall mount
Technology	
Technology	FPGA-based with packet inspection
Protocols proxy	Integrated on server/client
Ethernet ports	
OT side	8 x 1Gbps RJ45 PoE
IT side	1 x 1Gbps
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)

Protocols support	
Substation	DNP3.0, IEC60870-5-104, IEC61850
Industrial	Modbus TCP, OPCUA
File transfer	SFTP, FTP, TCP raw data
Management	Syslog
Reverse command	DNP3.0, IEC60870-5-104, IEC61850, Modbus TCP
Video	RTSP, ONVIF

## Ordering information

Model	Description
BIG-9000I	Intelligent unidirectional gateway with switch function, 8 PoE ports combining hardware data diode protection with Layer 3-7 packet inspection and traffic validation. OT side, 8x1GRJ45, IT side 1x1G RJ45, Power 9-57VDC, -40 to +70 °c, Din Rail/wall



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