MGate 5114 Series

1-port Modbus RTU/ASCII/TCP/IEC 101-to-IEC 104 gateways

Features and Benefits

- Protocol conversion between Modbus RTU/ASCII/TCP, IEC 60870-5-101, and IEC 60870-5-104
- Supports IEC 60870-5-101 master/slave (balanced/unbalanced)
- Supports IEC 60870-5-104 client/server
- Supports Modbus RTU/ASCII/TCP master/client and slave/server
- Effortless configuration via web-based wizard
- Status monitoring and fault protection for easy maintenance
- Embedded traffic monitoring/diagnostic information for easy troubleshooting
- microSD card for configuration backup/duplication and event logs
- Built-in Ethernet cascading for easy wiring
- Redundant dual DC power inputs and relay output
- -40 to 75°C wide operating temperature models available
- Serial port with 2 kV isolation protection
- Security features based on IEC 62443

Certifications

Introduction

The MGate 5114 is an industrial Ethernet gateway with 2 Ethernet ports and 1 RS-232/422/485 serial port for Modbus RTU/ASCII/TCP, IEC 60870-5-101, and IEC 60870-5-104 network communications. By integrating commonly used power protocols, the MGate 5114 provides the flexibility needed to fulfill the various conditions that arise with field devices that use different communications protocols to connect to a power SCADA system. To integrate Modbus or IEC 60870-5-101 devices onto an IEC 60870-5-104 network, use the MGate 5114 as a Modbus master/client or IEC 60870-5-101 master to collect data and exchange data with IEC 60870-5-104 systems.

Easy Configuration via Web Console

The MGate 5114 Series comes with an illustrated Quick Setup guide designed to make configuration easy. With Quick Setup, you can easily access protocol conversion modes and finish the configuration in a few steps.

Modbus RTU/ASCII/TCP Protocol Traffic Monitor

MGate 5114 Series gateways support Modbus RTU/ASCII/TCP, IEC 60870-5-101, and IEC 60870-5-104 Protocol Traffic Monitor for easy troubleshooting, especially during the installation stage. It is worth mentioning that traffic logs can be viewed in the popular troubleshooting tool, Wireshark. With this feature, you can easily analyze traffic to determine the root cause of a problem.

Maintenance Functions

MGate 5114 gateways support a system log function that records events in the MGate; users can easily review log data remotely through the web console. The gateways also support status monitoring and fault protection functions. The status monitoring function notifies a PSCADA system when a device gets disconnected or does not respond, in which case the PSCADA system gets the status of each end device and then issues alarms to notify operators.

Specifications

Ethernet Interface

10/100BaseT(X) Ports (RJ45 connector)	2 Auto MDI/MDI-X connection
Magnetic Isolation Protection	1.5 kV (built-in)

Ethernet Software Features

Industrial Protocols	Modbus TCP Client (Master), Modbus TCP Server (Slave), IEC 60870-5-104 Client, IEC 60870-5-104 Server
Configuration Options	Web Console (HTTP/HTTPS), Device Search Utility (DSU), Telnet Console
Management	ARP, DHCP Client, DNS, HTTP, HTTPS, SMTP, SNMP Trap, SNMPv1/v2c/v3, TCP/IP, Telnet, SSH, UDP, NTP Client
MIB	RFC1213, RFC1317
Time Management	NTP Client

Security Functions

Authentication	Local database
Encryption	HTTPS, AES-128, AES-256, SHA-256
Security Protocols	SNMPv3 SNMPv2c Trap HTTPS (TLS 1.3)

Serial Interface

Console Port	RS-232 (TxD, RxD, GND), 8-pin RJ45 (115200, n, 8, 1)
No. of Ports	1
Connector	DB9 male
Serial Standards	RS-232/422/485
Baudrate	50 bps to 921.6 kbps
Data Bits	7, 8
Parity	Even, Mark, None, Odd, Space
Stop Bits	1, 2
Flow Control	RTS Toggle (RS-232 only), RTS/CTS
RS-485 Data Direction Control	ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485	1 kilo-ohm, 150 kilo-ohms
Terminator for RS-485	120 ohms
Isolation	2 kV (built-in)

Serial Signals

RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422	Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w	Data+, Data-, GND
RS-485-4w	Tx+, Tx-, Rx+, Rx-, GND

Serial Software Features

Industrial Protocols	Modbus RTU/ASCII Master, Modbus RTU/ASCII Slave, IEC 60870-5-101 Master (Balanced/Unbalanced), IEC 60870-5-101 Slave (Balanced/Unbalanced)
Configuration Options	Serial Console

Modbus RTU/ASCII

Mode	Master, Slave
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Commands	128

Modbus TCP

Mode	Client (Master), Server (Slave)
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Client Connections	32
Max. No. of Server Connections	32
Max. No. of Commands	128

IEC 60870-5-104

Mode	Client Server
Max. No. of Client Connections	32
Max. No. of Server Connections	32
Max. No. of Information Objects	2000 points

IEC 60870-5-101

Mode	Master (Balanced/Unbalanced) Slave (Balanced/Unbalanced)
Max. No. of Master Connections	1
Max. No. of Slave Connections	1 (Balanced), 31 (Unbalanced)
Max. No. of Information Objects	2000 points

Memory

microSD Slot	Up to 32 GB (SD 2.0 compatible)

Power Parameters

Input Voltage	12 to 48 VDC
Input Current	455 mA @ 12 VDC
Power Connector	Screw-fastened Euroblock terminal

Relays

Contact Current Rating	Resistive load: 2 A @ 30 VDC

Physical Characteristics

Housing	Metal
IP Rating	IP30
Dimensions	36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)
Weight	507 g (1.12 lb)

Environmental Limits

Operating Temperature	MGate 5114: 0 to 60°C (32 to 140°F) MGate 5114-T: -40 to 75°C (-40 to 167°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)

Standards and Certifications

Safety	EN 60950-1, UL 508
EMC	EN 55032/24
EMI	CISPR 32, FCC Part 15B Class B
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m IEC 61000-4-8 PFMF
Hazardous Locations	ATEX, Class I Division 2, IECEx
Freefall	IEC 60068-2-32
Shock	IEC 60068-2-27
Vibration	IEC 60068-2-6, IEC 60068-2-64

MTBF

Time	1,140,815 hrs
Standards	Telcordia SR332

Warranty

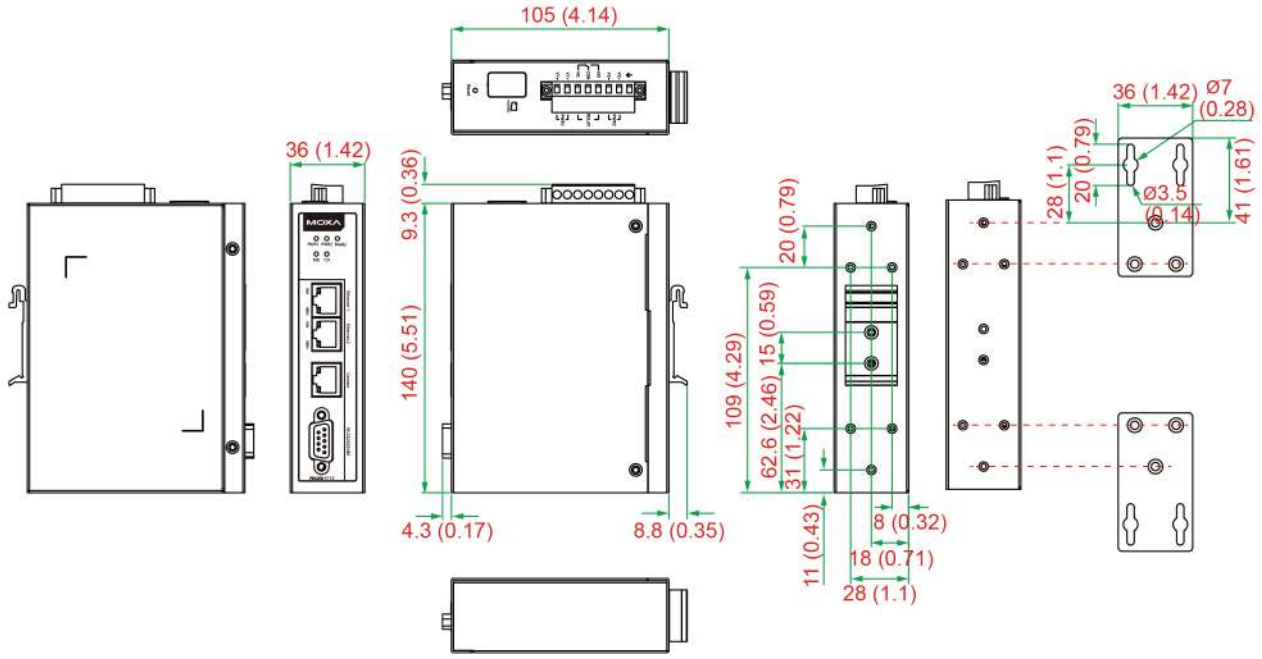
Warranty Period	5 years
Details	See www.moxa.com/warranty

Package Contents

Device	1 x MGate 5114 Series gateway
Cable	1 x RJ45-to-DB9 console cable
Installation Kit	1 x DIN-rail kit
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	Operating Temp.
MGate 5114	0 to 60°C
MGate 5114-T	-40 to 75°C

Accessories (sold separately)

Cables

CBL-F9M9-150	DB9 female to DB9 male serial cable, 1.5 m
CBL-F9M9-20	DB9 female to DB9 male serial cable, 20 cm
CBL-RJ45F9-150	8-pin RJ45 to DB9 female serial cable, 1.5m
CBL-RJ45SF9-150	8-pin RJ45 to DB9 female serial cable with shielding, 1.5m

Connectors

Mini DB9F-to-TB	DB9 female to terminal block connector

Power Cords

CBL-PJTB-10	Non-locking barrel plug to bare-wire cable

Mounting Kits

DK-25-01	DIN-rail mounting kit, 2 screws
WK-36-02	DIN-rail/wall-mounting kit, 2 plates, 6 screws