MGate™ 5114 Series

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

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

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 widely power common use protocols, MGate 5114 provides the flexibility to fulfill various conditions when facing the difference of protocols used between the field devices and the power SCADA. To integrate Modbus or IEC 60870-5-101 devices onto a 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 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 to mention that the traffic logs also can be shown in a popular troubleshooting tool, Wireshark. With that feature, you can easily analyze the the traffic to find out the root cause quickly.

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 when a device gets disconnected or does not respond, in which case the PSCADA gets the status of each end device and then issues alarms to notify operators.

Specifications

Ethernet Interface

Protocols: Modbus TCP client/server, IEC 60870-5-104 client/server
Number of Ports: 2 (1 IP; used for Ethernet cascading)
Speed: 10/100 Mbps, Auto MDI/MDIX
Connector: 8-pin RJ45
Magnetic Isolation Protection: 1.5 kV (built-in)
IEC 60870-5-104:
- Mode: Client/Server
- Max. Number of Connections:
  MGate as IEC 104 server: 32 client connections
  MGate as IEC 104 client: 32 server connections
- The maximum number of information objects: 2000 points

Modbus TCP:
- Mode: Client/Server
- Functions Supported: 1, 2, 3, 4, 5, 6, 15, 16, 23
- Max. Number of Commands: 128
- Max. Number of Connections:
  MGate as Modbus TCP Client: 32 server connections
  MGate as Modbus TCP Server: 32 client connections

Serial Interface

Protocol: Modbus RTU/ASCII master/slave, IEC60870-5-101 master/slave (Balanced/Unbalanced)
Number of Ports: 1
Serial Standards: RS-232/422/485, software selectable
Connectors: DB9 male
RS-485 Data Direction Control: ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485: 1 kΩ, 150 kΩ
Terminator for RS-485: 120 Ω
Isolation: 2 kV (built-in)
Modbus RTU/ASCII:
- Mode: Master/Slave
- Functions Supported: 1, 2, 3, 4, 5, 6, 15, 16, 23
- Max. Number of Commands: 128

IEC 60870-5-101:
- Mode: Master/Slave(balanced/unbalanced)
- MGate as IEC 101 master: 31 slave connections
  MGate as IEC 101 slave: 1 master connection
- The maximum number of information objects: 2000 points

Serial Communication Parameters

Data Bits: 7, 8
Stop Bits: 1, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, RTS Toggle (RS-232 only)
Baudrate: 50 bps to 921.6 kbps

Serial Signals

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

Software

Configuration Options: Web Console, Serial Console
Utility: Device Search Utility(DSU) for Windows 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1/10 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2
Support: MXconfig, MXview, SNMP (v1, v2, v3), Private MIB
Time Synchronization: Support NTP

Physical Characteristics

Housing: Metal, IP30
Weight: 507 g (1.12 lb)
Dimensions: 36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)
Storage Card Slot: 1 microSD (SDHC) card slot supports up to 32 GB
Relay Alarm Circuit: 3-pin circuit with current carrying capacity of 2 A @ 30 VDC

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Vibration: IEC 60068-2-6, IEC 60068-2-64
Shock: IEC 60068-2-27
Drop: IEC 60068-2-32

Power Requirements

Input Voltage: 12 to 48 VDC
Input Current: 455 mA max.
Power Connector: Terminal block

Standards and Certifications

Safety: UL 508, EN 60950-1
Hazardous Location: Class 1 Division 2, ATEX, IECEx*
*Certification is underway. Please contact a Moxa sales representative for details.
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
IEC 61000-4-8 PFMF

MTBF (mean time between failures)

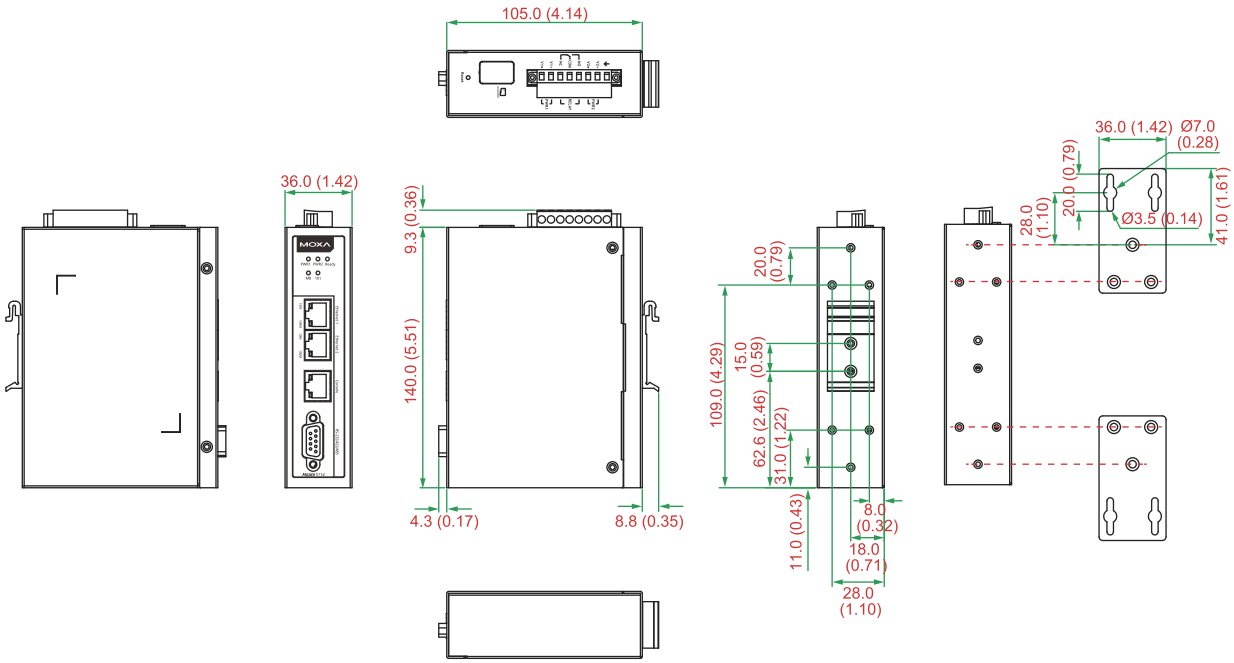
Time: 1,140,815 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

Available Models

MGate 5114: 1-port Modbus/IEC101 to IEC104 gateway, 0 to 60°C operating temperature
MGate 5114-T: 1-port Modbus/IEC101 to IEC104 gateway, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

CBL-F9M9-150: DB9 female to DB9 male serial cable, 150 cm
CBL-F9M9-20: DB9 female to DB9 male serial cable, 20 cm
CBL-RJ45F9-150: RJ45 to DB9 female serial cable, 150 cm
CBL-RJ45SF9-150: RJ45 to DB9 female serial shielded cable, 150 cm
Mini DB9F-to-TB DB9: Female to terminal block connector
DK-25-01: 1 DIN-rail kit with 2 screws
WK-36-02: DIN-rail/wall-mounting kit: 2 plates with 6 screws
CBL-PJTB-10: Non-locking barrel plug to bare-wire cable

Package Checklist

- 1 MGate 5114 gateway
- 1 serial cable: DBL-RJ45F9-150
- Quick installation guide (printed)
- Warranty card