



MIDAM CETH48501

Ethernet – RS485, Modbus RTU/IP router



10/100 Mbit Ethernet to RS485 converter with Modbus RTU/IP routing (terminal server) capability. It offers transparent data transfer between Modbus devices and controllers on different physical layers. The converter features integrated web server for simple, browser-based configuration and provides the simplest solution to connect serial and Ethernet Modbus devices in industrial automation applications.



CONVERTERS

Application

- Modbus RTU Master to Modbus TCP/IP Client mode
- Modbus RTU Slaves to Modbus TCP/IP Client mode
- Modbus TCP/IP Servers to Modbus RTU Master mode
- Remote Modbus RTU/RS485 device to SCADA Modbus TCP connection via an Ethernet network
- Connection of third party I/O modules for data transmission and signal readouts
- Applications where the Ethernet side delays may not meet the timing requirements of the serial protocol driver

Function

The CETH48501 converter is able to connect any RS485 device to a PLC/PC over an Ethernet network. Either protocol is able to read or write values to and from the shared block of data or Modbus RTU slaves are presented as Modbus TCP/IP servers. Requests sent to a Modbus TCP/IP node ID will be routed to the matching slave ID on the Modbus RTU network. The third option is that Modbus TCP/IP servers are presented as Modbus RTU slaves. Define the IP address and unit ID's of your Modbus server devices in the router.

Then define what slave ID they will be mapped to. The Digi RealPort Software creates a virtual COM port on the host PC. This virtual port enables any software to communicate with a remote RS485 device. The COM port redirector runs under Microsoft Windows, UNIX and Linux. Maximum communication speed is 115200 bps. The communication circuits are protected against overvoltage and galvanically isolated from other parts of the converter.

The module parameters and functions are configured over SNMP or secured web communication (HTTP / HTTPS protocols). The converter status is indicated by a green LED (Power) positioned close to the serial connector. The RS485 data communication is indicated by two LEDs: green (TxD) and red (RxD). The Ethernet connector (RJ45) provides two LEDs: Link and Network activity. The RS485 bus may be terminated using the BUS END DIP switch. Communication speed and number of data bits are set by dedicated DIP switches as well.

Industrial Automation Profile

The Industrial Automation (IA) Profile allows you to connect IA devices and PLCs to the serial port in order to network-enable the devices. Use this profile if you need to communicate over the network with an IA device or PLC that only uses serial protocols. This profile may also be used to add routing capabilities to IA devices or PLCs that act as serial masters and send packets to various systems or devices on the network. Industrial Automation profile enhances the IA device or PLC connected to the serial port.



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Technical data

Power supply	24 V AC/DC \pm 10 %
Consumption	max. 2 W
Communication	<p>Ethernet "based on DIGI Connect ME solution" 1x Ethernet 10/100BaseT; galvanically insulated, insulating voltage 1 kV RJ45, 2x LED (link, data) integrated in the connector</p> <p>RS485, Modbus RTU (K+, K-) baud rates 300 ... 115 200 bit/s, parity and bits are set over Modbus RTU, default 9600/8/N/1 maximal bus length 1200 m, maximum number of modules depends on requested response time 255 addresses are supported, galvanic isolation 1 kV</p>
Protocol	Modbus RTU, 256 node (RS485)
Indication	3 x LED - PWR (green, power supply), TxD (green, RS485 communication), RxD (red, RS485 receiving data)
SW	Digi RealPort (creates a virtual COM port on the host PC) configuration via web interface
Mechanical and dimensions	98.7 x 36.2 x 64 mm (l x w x h) Polycarbonate enclosure (UL94V0), IP20 3x DIP switch blocks - BUS END, SW1...SW4 (RS485 communication speed), INIT (default configuration)
Terminals	4x M3 screw terminals (PWR, K+, K-) Recommended wire diameter 0.5 to 1.5 mm ²
Ambient conditions	+5 to +40 °C, 5 % to 85 % rH (EN 60721-3-3. Class 3K3)



CONVERTERS

Terminals and connection

K-	Serial line RS485 -
K+	Serial line RS485 +
G	Power supply
G0	Power supply
Ethernet	Network interface (RJ45)



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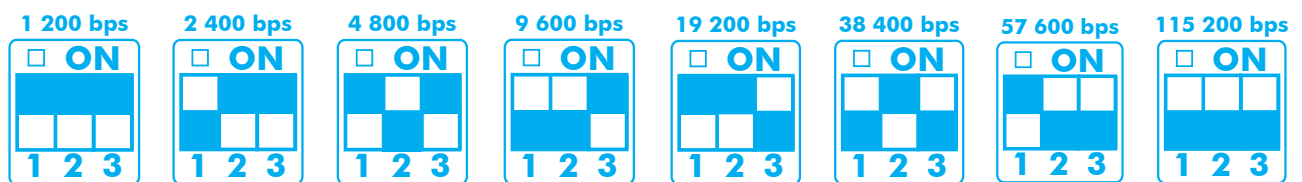
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LED indication and DIP switches

BUS END	Bus end RS485, the first and last devices on the bus should have bus end in ON position.
TxD	Green LED - RS485 transmitting data (flashing: transmitting data; OFF: no data traffic).
RxD	Red LED - RS485 receiving data (flashing: transmitting data; OFF: no data traffic).
PWR	Green LED - power (ON: power OK; OFF: no power applied, weak or damaged power supply).
SW1	RS485 communication speed switch (for combination and values see scheme below).
SW2	RS485 communication speed switch (for combination and values see scheme below).
SW3	RS485 communication speed switch (for combination and values see scheme below).
SW4	Number of bits (OFF: 8bits; On: 9 bits) If parity (Even/Odd) is used, switch must be ON (9 bits).
INIT	In ON position (connected with clamp) at power-up - configuration parameters are brought to factory defaults.

RS485 communication speed setup



Communication settings

Default network settings

- IP address:** 192.168.1.37
- Subnet mask:** 255.255.255.0
- Default gateway:** 0.0.0.0
- User:** root
- Password:** unique code printed on product label

Note the changed network settings for future reference!

All parameters including network configuration are available through an integrated web interface on TCP port 80. Comprehensive help for each settings option is displayed after click on the „? Help“ button in the upper right corner. For detailed description of all settings in the Digi Connect tools refer to the most up to date version of user guide available at <http://www.digi.com>. Communication speed and number of data bits are set by DIP switches. See Scheme RS485 communication speed setup above.

Connection to web interface and IP settings

1. Use a RJ45 cable to connect converter to web network. Connect converter to power supply (24 V DC/AC, terminals G and G0, any polarity). Wait approximately 30 seconds for the converter to start.
2. Fill converter IP address in web browser. Connect to the web interface.
3. In case of unknown IP address of the converter, choose your operating system and download program Device Discovery Utility available at <http://www.digi.com>.
4. Start the Device Discovery Utility. In case of successful detection, you can see the converter IP address in the program window. If there are some problem with detection switch off the PC firewall. The network card must be able to receive the broadcast answers.
5. In the Device Tasks dialogue set the new IP address (Configure network settings) or go directly to the web pages of the CETH48501 web interface.
6. If you can not log in, bring the converter to factory defaults.





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Modbus router and virtual port settings

Virtual COM port on PC

1. Download and install the latest available version of the Digi RealPort software.
2. Download the actual drivers from <http://www.digi.com>. In the Operating System Specific Drivers menu, choose your operating system and download appropriate drivers.
3. If the converter is in the same network, the program detects the device after installation. Otherwise, the IP settings must be configured accordingly.
4. Connect to the converter through web interface.
5. In section "Configuration" select "Serial Ports" and "Port1". Set the profile "RealPort" and confirm the configuration with "Apply" button.

Do not change the advanced settings in the web interface. Inappropriate settings may result in communication problems, timeouts etc.

Modbus router settings

1. Connect to the converter through web interface.
2. In section "Configuration" select "Serial Ports" and click on "Port 1". Set serial port to profile "Industrial Automation" and "Apply" the changes.
3. The Modbus router listens at the default Modbus TCP port 502.

Do not change the advanced settings in the web interface unless you know what you are doing. Inappropriate settings may result in communication troubles, timeouts etc.

Factory settings

If the connection and reset option through the web interface is not possible, bring the converter into Factory Default Settings as indicated below.

1. Disconnect power terminal and plug in a jumper on the pins between power terminal and the outside part of the box.
2. Connect converter and PC by a serial (nullmodem) cable. If the PC does not have a RS485 port, use a USB/RS485 converter.
3. Start a serial terminal software on the PC and select the COM port which connects to the converter. Communication parameters are 9600, 8 bits, N (none) parity, 1 stop bit. Data flow control None.
4. When the connection has been established, bring the converter

to power supply again.

5. There is the CETH48501 menu in the window. Press 2 (Erase the BOOTPARAM from flash) and wait for the "Finished" message. Then press 1 (Erase the NVRAM from flash) and wait for the "Finished" message.
6. Terminate the connection, switch-off power and disconnect the INIT clamp on the device.
7. Connect the power supply. In a couple of minutes the converter will available for search/connect again. All the settings are default. The IP setting has DHCP set to ON. The converter will prompt for a new IP address from a DHCP server. If there is no DHCP server in the network, the device address will start from 169.254.xxx.xxx. (Switch off the Windows firewall and detect device by the Device Discovery Utility).

Changes in versions

08/2019	New datasheet version (v19/08).
01/2021	Communication password updated, Industrial Automation Profile capability described (v21/01).

