INTECH Micro 2300-NET

10/100 Ethernet to RS485 Converter

Overview
The 2300-NET is an Ethernet to serial (RS485) bridge specifically designed to connect the 2300 series I/O stations to the 10/100 Base-TX Ethernet network. This facilitates the MicroScan V5 SCADA to allow remote I/O station addressing to the 2300 series stations via the TCP network.

The 2300-NET can also be configured to operate in a number of different modes including as a gateway function of converting Modbus TCP messages to Modbus RTU messages.

Installation Guide

2300-NET Installation Guide Index.

2300-NET 10/100 Ethernet to RS485 Converter.

Converts Modbus TCP 10/100 Ethernet to Modbus RTU RS48 for communication to a field Remote I/O Station.

Features.

- Easy to Install.
- LED Status Indications.
- Compact DIN Rail Mount Enclosure.
- Modbus TCP to Modbus RTU.
- MicroScan SCADA compatible.
- Easy configuration via MicroScan V5.
- Low Cost.

2300 models include:
2300-A8I : 8 Current Inputs.
2300-A8II : 8 Isolated Current Inputs.
2300-A8VI : 8 Isolated Voltage Inputs.
2300-Tc8 : 8 Isolated Thermocouple Inputs.
2300-RTD6 : 6 RTD Inputs.
2300-MULTI : 2 RTD, 2 AI, 1 AO, 4 DI, 2 DO.
2300-D16 : 16 Digital Inputs.
2300-RO4 : 4 Relay Outputs.
2300-NET : Ethernet to RS485.

Description.

The 2300-NET is an Ethernet to serial (RS485) bridge specifically designed to connect the 2300 series I/O stations to the 10/100 Base-TX Ethernet network. This facilitates the MicroScan V5 SCADA to allow remote I/O station addressing to the 2300 series stations via the TCP network.

The 2300-NET can also be configured to operate in a number of different modes including as a gateway function of converting Modbus TCP messages to Modbus RTU messages.

The 2300-NET can be connected to a Network HUB (switch) or direct to a computer using a crossover cable.
The 2300-NET is factory assigned to a default IP address of **192.168.0.112**.
Using the MicroScan V5 SCADA software, this address will need to be changed to a static IP address to be used on your network. For the initial setup, the factory address must be valid on your network, by changing your computers IP address to 192.168.0.113 or by having IT staff add 192.168.0.112 as a valid address in your servers DHCP setup. When setting up the 2300-NET for your network, we recommend using a crossover Ethernet cable connected directly between the PC and the 2300-NET.

For other SCADA uses, to change this address, you must open 192.168.0.XXX on your network and use a web browser to change the settings of the 2300-NET to a valid address on your network.
The web server can be accessed by most web browsers.
The web page address for viewing the setup parameters is **http://192.168.0.112/index.htm**
The web page address for configuring the 2300-NET is **http://192.168.0.112/ip.htm**

For configuration please refer to MicroScan V5 Help.
Search for "2300-NET"

Quality Assurance Programme.

The modern technology and strict procedures of the ISO9001 Quality Assurance Programme applied during design, development, production and final inspection grant long term reliability of the instrument. This instrument has been designed and built to comply with EMC and Safety Standards requirements.

Specifications.

Power Supply:	Field Supply Voltage	12~24Vdc
	Field Supply Current	90mA @ 10Vdc / 40mA @ 26Vdc
	Connector	8 way screw connector for Power and Comms

Ethernet:	10/100 Mbit/s	10/100Base-TX
	Connector	RJ45

Serial:	RS485	2 Wire Multi drop twisted pair
	Baud Rate	9600
	Format	8 bit, No Parity, 1 Stop

General Specifications: (Unless otherwise stated in other input specifications).		
Operating Temperature		-10~50˚C
Storage Temperature		-40~85˚C
Operating Humidity		Up to 95% non condensing
Housing	Dimensions	L=106, W=70, H=59.5mm
	Mounting	35mm Symmetrical Mounting Rail

Note 1. Contact INTECH INSTRUMENTS for more detailed programming information.

Product Liability. This information describes our products. It does not constitute guaranteed properties and is not intended to affirm the suitability of a product for a particular application. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification. Regrettably, omissions and exceptions cannot be completely ruled out. No liability will be accepted for errors, omissions or amendments to this specification. Technical data are always specified by their average values and are based on Standard Calibration Units at 25C, unless otherwise specified. Each product is subject to the 'Conditions of Sale'.

Warning: These products are not designed for use in, and should not be used for patient connected applications. In any critical installation an independent fail-safe back-up system must always be implemented.

2300-NET Dimensions.

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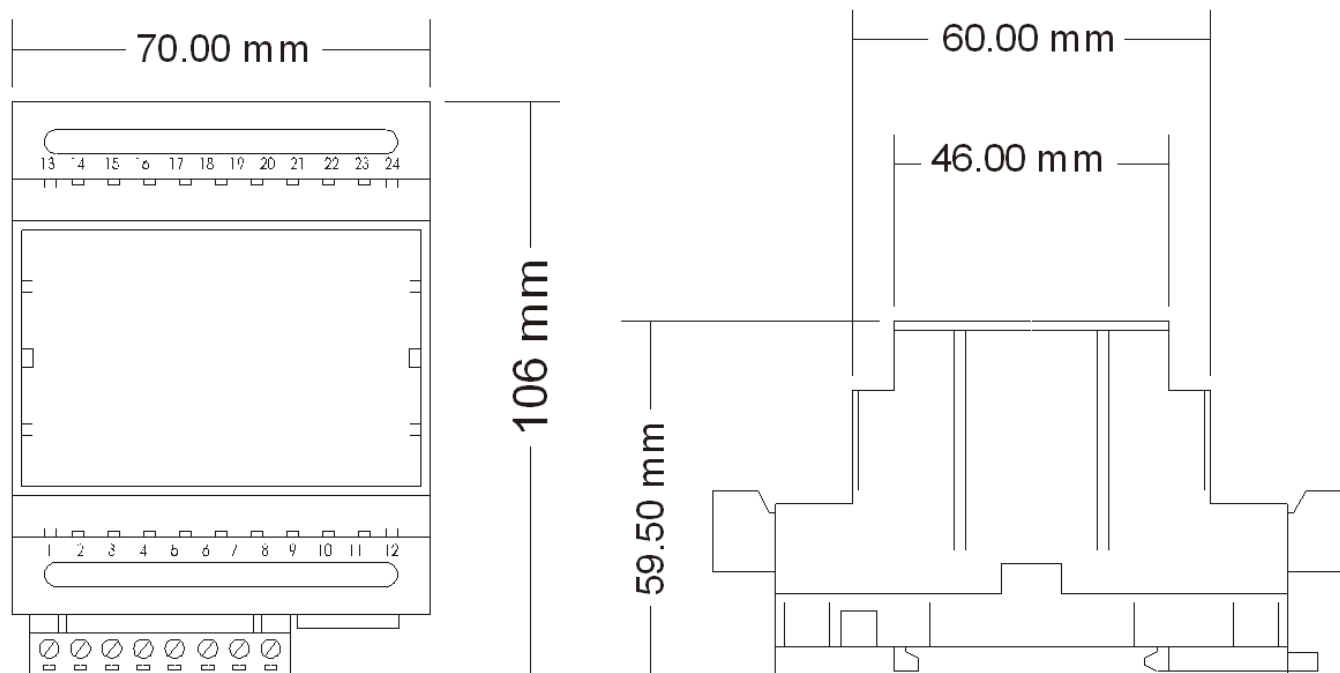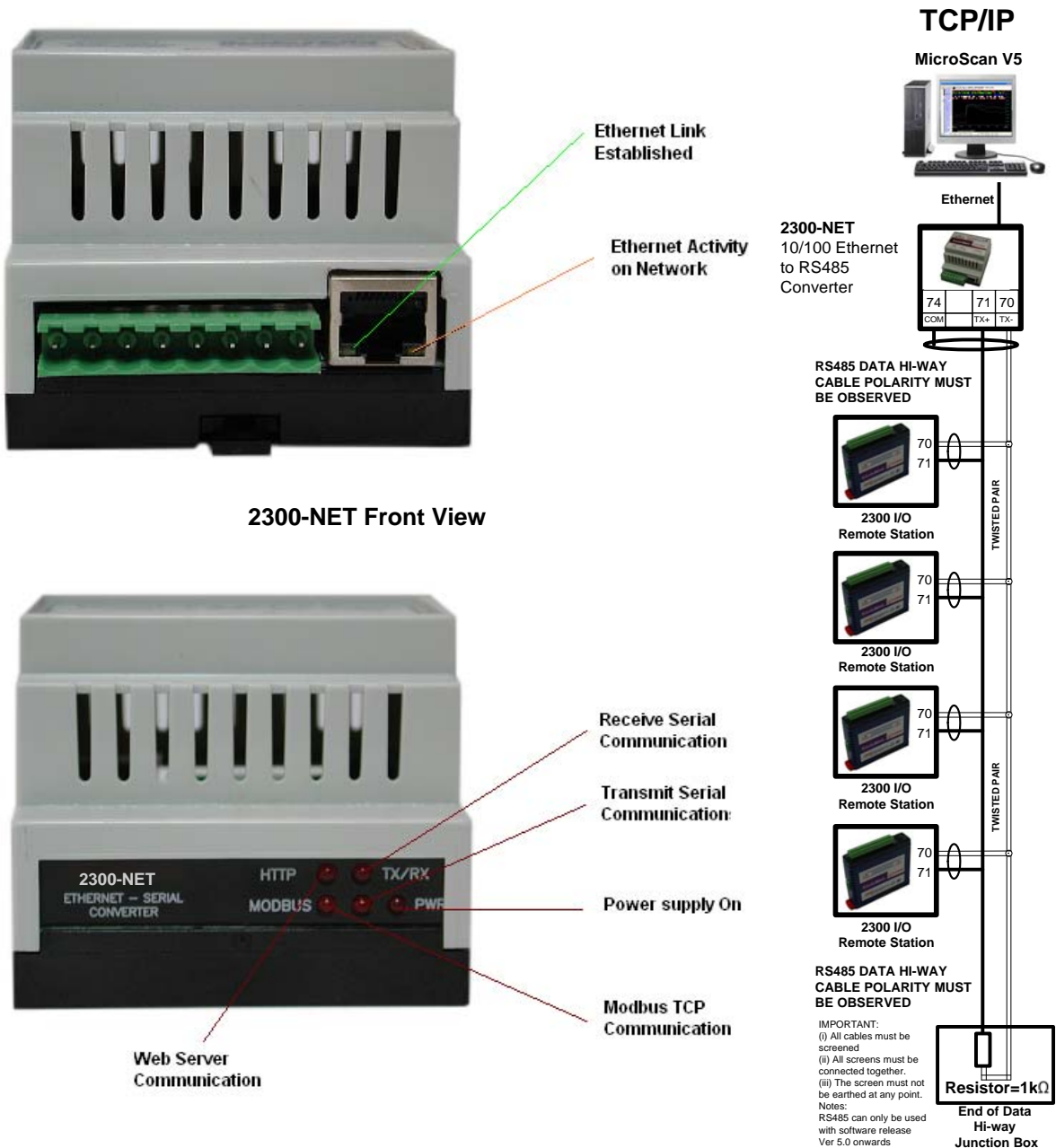
Power Connections.

The Ethernet/Serial Protocol bridge 2300-NET must be clipped onto a DIN rail. Power for the 2300-NET must be applied to terminal 82 (+ 24Vdc) and terminal 81 (- 0V). The power LED will illuminate and all LED's will be off.

Ethernet Connection:

Ethernet connection is either through a network or directly to a PC. The Ethernet interface uses a standard RJ45 connector.
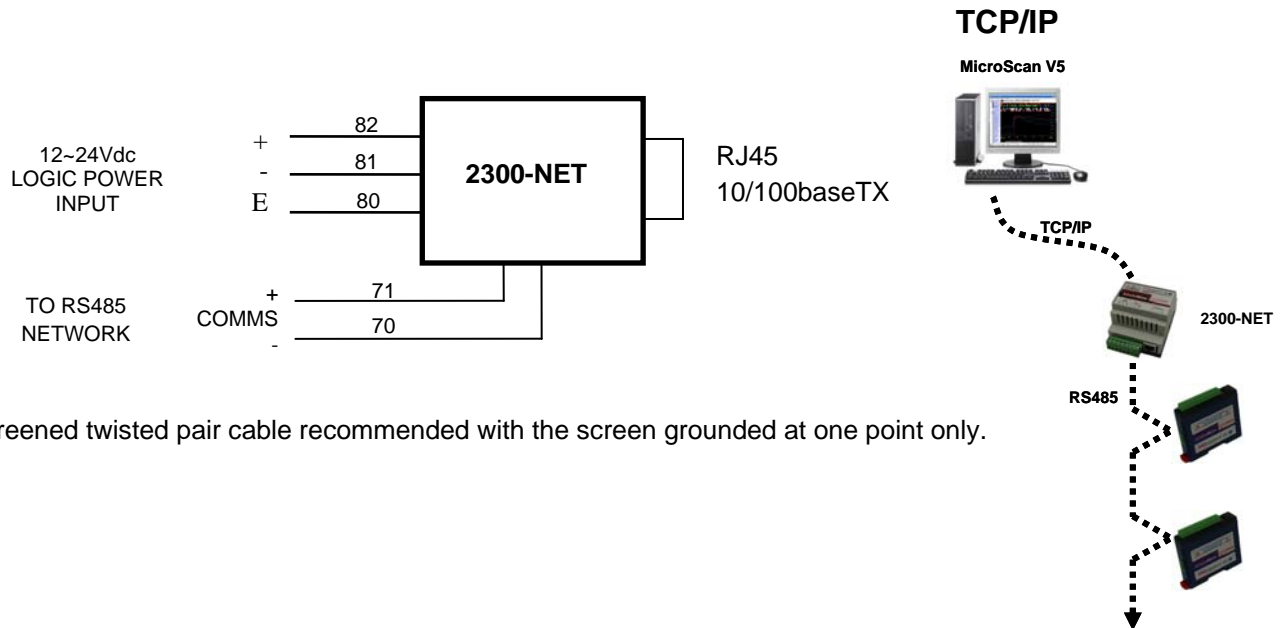
Indication LED'S.

The LED's on the 2300-NET are used to indicate the operation of the module.

TCP/IP

MicroScan V5

Ethernet Link Established

Ethernet Activity on Network

2300-NET Front View

2300-NET
10/100 Ethernet to RS485 Converter

74		71	70
COM		TX+	TX-

RS485 DATA HI-WAY CABLE POLARITY MUST BE OBSERVED

| 70 |
| 71 |

2300 I/O Remote Station

| 70 |
| 71 |

2300 I/O Remote Station

| 70 |
| 71 |

2300 I/O Remote Station

| 70 |
| 71 |

2300 I/O Remote Station

RS485 DATA HI-WAY CABLE POLARITY MUST BE OBSERVED

TWISTED PAIR

IMPORTANT:
(i) All cables must be screened
(ii) All screens must be connected together.
(iii) The screen must not be earthed at any point.
Notes:
RS485 can only be used with software release Ver 5.0 onwards

Resistor=1kΩ

End of Data Hi-way Junction Box

Receive Serial Communication

Transmit Serial Communication

Power supply On

Modbus TCP Communication

Web Server Communication

2300-NET
ETHERNET — SERIAL CONVERTER

HTTP   TX/RX
MODBUS   PWR

Procedure to reset to default IP address [192.168.0.112]

a. Remove power.

b. Remove "Default IP" jumper.

c. Plug in Ethernet cable and connect to switch.

d. Apply power.

e. After about 2 seconds the link LED should come on and must not flash. (LED closest to green connector)

f. Replace jumper. **WARNING:** The jumper must be in place for the 2300-NET to retain programmed settings!

Examples of connectivity to 2300 series I/O station

TCP/IP

MicroScan V5

```
                            82
12~24Vdc      +    ─────────────┐
LOGIC POWER   -    ──── 81    ┌──────────┐
INPUT         E    ──── 80    │ 2300-NET │──┐  RJ45
                              └──────────┘  │  10/100baseTX
                            71                │
TO RS485      +    ──────────────────────────┘
NETWORK    COMMS   ──── 70
              -
```

TCP/IP

2300-NET

RS485

Screened twisted pair cable recommended with the screen grounded at one point only.

Troubleshooting Guide.

#:	Checkpoint		Solution
1	Is the LINK LED on and is the ACTIVITY LED flashing with short pulses?	No	No network connection is detected. The Ethernet cable is either not plugged in or wrong type of cable is used. For connection to a network with a hub or switch, a straight through network cable can be used. For direct connection between PC and the 2300-NET, a cross over Ethernet cable must be used.
		Yes	A network connection is detected; the 2300-NET is connected to the network.
2	Does the 2300-NET respond to PING requests?	No	Either the PC or the 2300-NET is setup with wrong IP address. Setup the 2300-NET with default IP address. To change the IP address of a PC, use the Windows "control panel -> network -> TCP/IP properties" and setup an IP address close to the 2300-NET address. The 2300-NET is shipped with a default IP address of **192.168.0.112**, the PC can be setup with an IP address of 192.168.0.113
		Yes	The PC and 2300-NET are setup with a correct IP address and they are able to communicate with each other.
3	Can the default Web page be accessed in a Web browser?	No	This is normally caused by the setup of the Web browser. In the "options" or "preferences" menu, check that the Web browser is configured for direct network connection or local area network and **NOT** using a proxy server.
		Yes	No problems.
4	Are the LINK LED and ACTIVITY LED flashing together?	No	Switch off the power to 2300-NET. Wait for some time before switching on the power for next time.
		Yes	No problems.

2300-NET RS485 settings.

When setting up the 2300-NET IP address it is also necessary to check that the Comms is set for RS485 mode – scroll down the browser page to the area shown:

Make sure '1' is selected as shown above.

WARNING: The "Default IP" jumper must be in place for the 2300-NET to retain programmed settings! This information is also available in the MicroScan help file:

Wiring and Installation.
The Proper Installation & Wiring of the 2300-NET.

All power and signals must be de-energised before connecting any wiring, or altering any Jumpers or Dip Switches.

Mounting.
(1)   Mount in a clean environment.
(2)   Draft holes must have minimum free air space of 20mm. Foreign matter must not enter or block draft holes.
(3)   Do not subject to vibration, excess temperature or humidity variations.
(4)   Avoid mounting near power control equipment.
(5)   Allow 10mm minimum clearance between the 2300-NET terminals and ANY conductive material.
(6)   To maintain compliance with the EMC Directives the 2300-NET is to be mounted in a fully enclosed steel fire cabinet. The cabinet must be properly earthed, with appropriate input / output entry points and cabling.

Power Supply Wiring.
(1)   A readily accessible disconnect device and a 1A, 24Vdc overcurrent device, must be in the power supply wiring.

Ethernet Cabling.
Category 5 (Cat 5) or better (e.g. Cat5e or Cat6) cable is required for 100Mbps fast Ethernet transmission. The 2300-NET uses a standard RJ45 Connector.
For initial setup of the 2300-NET we recommend using a crossover Ethernet cable connected directly between the PC and the 2300-NET.

RS485 cable.
Single pair data low capacitance data cable with overall screen (cat 5 or better) terminated as shown in the wiring diagram on page 14.29-5.

2300-NET Commissioning.
(1)   The MicroScan V5 Data loop should be wired locally to the attached stations.
(2)   The Ethernet cable should be connected to the unit. For initial setup of the 2300-NET we recommend using a crossover Ethernet cable connected directly between the PC and the 2300-NET.
(3)   Check that all the above conditions have been met, and the wiring checked, before applying power to the 2300-NET.
(4)   The POWER LED should be ON.
(5)   The Ethernet port LEDS will light up.
(6)   The TX LED lights up when the 2300-NET is sending data to the attached stations.
(7)   The RX LED lights up when the 2300-NET receives data from the attached stations.
(8)   If no communication, check that the 2300-NET is set for RS485 (please see page 14.29-7 or the MicroScan help file for instructions).

Port number information.
        Port 1234   MicroScan mode
        Port 502   Modbus TCP to Serial RTU bridge mode