

## EKM-iSerial - TCP/IP to Serial Converter **Spec Sheet**

### I. Introduction

The EKM-iSerial is a cost effective and highly integrated Serial-to-ethernet converter. Embedding a 8051CPU, 64KB OTP ROM, 32K bytes SRAM, 10/100 Mbps ethernet and serial port support handshake RTS, CTS. The EKM-iSerial can control RS-232/422/485 devices located virtually anywhere (via ethernet or internet). Automatically finds devices in the network. Serial Port, Telnet, Web Browser, SMTP. Automatic mode switching between Driver and RAW mode Support TCP/IP, UDP, DHCP, PPOE.

### II. Features

3-in-1 RS-232/422/485 interface. Max 230 Kbps. Serial interface and 10/100 Mbps ethernet. Supports 4-wire and 2-wire RS-485 with AUTO-SENDDTM and built-in terminator. Supports industrial 24 VDC power input. Terminal block for easy RS-422/485 serial wiring. Supports IP configuration by MAC address. Supports configuration store and copy for easy deployment. Supports Driver, TCP Server/Client, Pair Connection operation modes. Easy and powerful configuration program. Approval: CE, RoHS.

**Connect to ethernet 10/100M:** Connect to a switch or HUB using a straight-through cable.

**Power Supply:** The EKM-iSerial TCP/IP converter can use the supplied 9v power adapter, or use another DC power source. (9-24VDC, @ 500-1000mA).

**LED Indication:** LINK – green indicates ethernet link is established. ACT – Data sending/receiving between the iSerial and ethernet. PWR – Indication of power.

### III. Setup

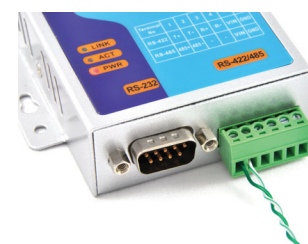
1.) Plug an ethernet cable into the iSerial and also into your router or LAN. Connect power to your iSerial. Does your LAN (local area network) already use the IP address 192.168.1.xxx? If it does, proceed to step 3. If you are unsure, perform the following to find out:

**Windows Users:** From the START menu, choose "Run...". Type "cmd" and hit ENTER. Windows 7 users can simply type "cmd" into the start menu line and press enter. In the window that opens, type "ipconfig" and hit the ENTER key. Look for "IP Address" or "IPv4 Address." The number right across from that is your local IP address.

**Mac Users:** From the apple menu at the top left of your screen, click on System Preferences, then on Network. Make sure that your local network is highlighted to the left (Airport, ethernet, etc.). Your local IP address will be noted in the sentence to the right ("Wi-Fi is connected to xxxxxx and has the IP address 192.168.1.xxx", etc.).

2.) If your LAN network already uses the IP address range 192.168.1.xxx proceed to step 3. If not, change your LAN IP address range by performing the following:

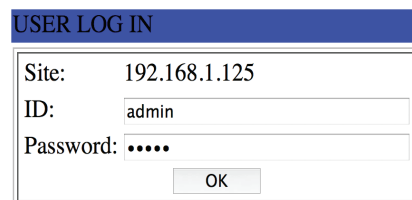
**Windows 7:** Disconnect your computer from your network/internet/LAN. Plug your iSerial into your computer using an ethernet cable. Follow the fairly straight forward tutorial here: <http://windows.microsoft.com/en-US/windows7/Change-TCP-IP-settings> Write down the IP address and Subnet mask settings before you change them. You will need these to restore your computer's original settings. Follow steps 1 to 4 in the tutorial. In step 2 right-click on Local Area Network. In step 4 click on "Use the following IP address." In the "IP address" line, enter the IP address: "192.168.1.237". In the "Subnet mask" line enter "255.255.255.0". Default Gateway: "192.168.1.1"



**Windows XP:** Disconnect your computer from your network/internet/LAN. Plug your iSerial into your computer using an ethernet cable. From the START menu, choose Settings->Control Panel->Network Connections. Double-click the "Network Connections" icon. In the "Network Connections" window, double-click "Local Area Connection." In the "Local Area Connection Status" window, click the "Properties" button. In the "Local Area Connection Properties" window, select "Internet Protocol (TCP/IP)" and click the "Properties" button. In the "Internet Protocol (TCP/IP) Properties" window, note if "Obtain IP address automatically" or "Use the following IP Address" is selected. If "Use the following IP address is selected, write down the IP address and Subnet mask settings. You will need these to restore your computer's original settings. Click the radio button for "Use the following IP Address." In the "IP address" line, enter the IP address: "192.168.1.237". In the "Subnet mask" line enter "255.255.255.0". Click "OK". Click "OK". Click "Close".

**Mac OSX:** Plug your iSerial into your computer using an ethernet cable. Click the Apple icon in the upper left of the screen. Turn off Airport (WiFi). Click on Ethernet. Where it says "Configure IPv4:" select "Manually" from the drop down menu. In the "IP address" line, enter the IP address: "192.168.1.237". In the "Subnet mask" line enter "255.255.255.0". Click on "Apply."

**3.)** Now you can access your iSerial. Type: 192.168.1.125 into the URL on your web browser (this is the default IP address of the iSerial). This will take you to a page that asks for your user ID and Password. Default User ID: **admin** Default Password: **admin**  
Note: some users experience issues with the Safari and Internet Explorer browsers - Firefox seems to work better. On the left, click on "UART."



USER LOG IN

Site:	192.168.1.125
ID:	admin
Password:	.....
<input type="button" value="OK"/>	

**Note:** Do **NOT** click on "Firmware Update" or "Bootloader Update"! This will make your iSerial unusable and we have no way to restore the iSerial for you. Only do this if you are sure you know what you are doing.

You can now change the default IP address of the iSerial to match the original range of your computer's LAN network, if you changed it previously. Click on "Administrator" in the top left. Click on "System Configuration". Enter and address in your original IP address range. You can make up the last 2 or 3 digits (they must be unique from any other device on your LAN network). After this you will revert your computer's address back to its original settings. Be sure to keep track of the new IP address of the iSerial as you will need it to read your meters with the EKM Dash software, and may need it in the future to access your EKM iSerial. If you lose it we cannot retrieve it for you. For EKM-Omnimeter v.3 and v.4 meters, make sure the settings are: RS-485, 9600 baud, 7 data bit, even parity, 1 stop bit. For all other meters (v.2) make sure the settings are: RS-485, 1200 baud, 7 data bit, even parity, 1 stop bit.

**Connecting your EKM meters to the iSerial:** Using RS-485 twisted pair, bare ended wire (there are 4 twisted pairs of wire found inside CAT5 cable), connect RS-485 A+ on all meters to T+ on the iSerial. Connect RS-485 B- on all meters to T- on the iSerial. GND is not necessary. Your meter(s) are now ready to be read over your local area network, using our EKM Dash software. Please see documentation about downloading and setting this up here:  
<http://www.ekmmetering.com/information/the-complete-guide.html>

**Firewalls and DNS:** To be able to read your meter(s) over the internet, you will need to make settings in your firewall (usually this is set internally in your router) at the site where the meters and iSerial are installed. To make it possible for requests coming from a remote computer to reach the iSerial, your router needs to be set to allow the incoming requests to pass. This is called opening ports in the firewall or port forwarding in most routers. If you do not have a static IP address (most people do not) you will have to set up with a website like DynDNS.org, No-IP.com, or others to get an address you can always connect to remotely. Here is a brief explanation from No-IP.com's website:  
[http://www.no-ip.com/support/guides/routers/router\\_port\\_fowarding.html](http://www.no-ip.com/support/guides/routers/router_port_fowarding.html)

If you are uncomfortable doing this, the aid of a computer networking professional is always recommended.

## IV. Explanation of Relevant Menu features

### Under “Administrator”:

#### Authentication Configuration:

The Users can change the username and password to prevent unauthorized access.

User Name default: “admin” Password default: “admin”

**System IP Configuration:** The EKM iSerial supports two IP connection types: Static IP and DHCP. These types are listed in the web page for the IP Configuration setting. Each setup screen and available features will differ depending on what kind of IP connection types you select. Default is Static IP. We will only guide you through the use of the Static IP and its configuration.

#### Static (or Fixed) IP:

IP Address: default 192.168.1.125

Subnet mask: default 255.255.255.0

Gateway: default 192.168.1.1

Primary DNS: default 0.0.0.0

If you need to change these settings, perform these steps:

- 1.) Enter IP address that is consistent with your LAN IP address range.
- 2.) Enter Subnet mask
- 3.) Enter Gateway (router) IP address
- 4.) Enter primary DNS IP address
- 5.) Click “Update” button

<b>Administrator</b>
<a href="#">Authentication Configuration</a>
<a href="#">System IP Configuration</a>
<a href="#">System Status</a>
<a href="#">Load default setting</a>
<a href="#">Firmware update</a>
<a href="#">Boot Loader upgrade</a>
<b>TCP Mode</b>
<b>UDP Mode</b>
<b>UART</b>
<b>SMTP</b>
<b>ADC</b>
<b>DIDO</b>
<b>Reset Device</b>

**\*DHCP:** Using DHCP will mean that the IP address of the EKM iSerial may change, making it much more difficult to maintain your connection to the iSerial. If you choose to use DHCP, it is assumed that you have your own reasons for doing so, that you know what you are doing, and that you won't need instruction or guidance.

**System Status:** This screen shows the EKM iSerial's current status. All of the information provided is read-only.

**Load Default Setting:** Allows users to reset the EKM iSerial to the default value, but the MAC address will not update.

**Operation Modes:** The EKM iSerial supports four operation modes: TCP Server, TCP Client, UDP Server, and UDP Client. These modes are listed in the web page for the Operation mode setting. Each setup screen and available features will differ depending on what kind of operation mode you select. Default is TCP Server and EKM meters utilize this mode.

**TCP Server:** Port Number: default 50000, range 0 to 65535. If you are setting the device as passive to accept commands from remote and the data must be guaranteed to be received by the peer, then you can set EKM iSerial as TCP server. Be sure the Port Number is the same as the remote control application you are using.

Client mode inactive timeout (minutes): default 20 (0=Disable) if you want to keep the connection between the EKM iSerial and your remote control application always on, set the value to 0. Otherwise the EKM iSerial will terminate this connection after inactivity for the specified time.

**\*UDP Server:** Local Port Number: default 50000, range 0 to 65535. If you are setting the device as passive to accept commands from remote and absolute integrity of the data to be received by the peer is not your concern, then you can set EKM iSerial as UDP Server. Make sure the Local Port Number is the same as in the remote control application you are using.

**\* Not Used for EKM Metering Systems.**

**\*UDP Client:** Remote Connection Port Number: default 50000, range 0 to 65535 Remote Host IP Address: default 192.168.1.2. If you are setting the device as active to report real-time status, and absolute integrity of the data to be received by the peer is not your concern, then you can set the iSerial as UDP Client. Be sure the value in Remote Connection Port Number is the same as the remote control application you are using and set the correct value of Remote Host IP Address.

**UART Control (RS-232, RS-422, RS-485):** The EKM iSerial supports three serial types: RS-232, RS-422, and RS-485, select the appropriate mode and the following default settings:  
 Baud Rate: default 9600(v.3 and v.4 meters) or 1200(v.2 meters)  
 Range: 300bps to 230.4Kbps  
 Character bits: 5, 6, 7 (default), 8  
 Parity Type: Even (default), odd, , none, space, mark  
 Stop Bits: 1 (default), 1.5 or 2  
 Hardware Flow Control: None (default), CTS/RTS (or Hardware)

**For EKM Meters:**

Baud Rate: 9600(for v.3 & v.4 meters) or 1200(for v.2 meters, iSerial can only be used with one meter type).  
 7 Bit  
 Even Parity  
 1 Stop Bit  
 No Flow Control

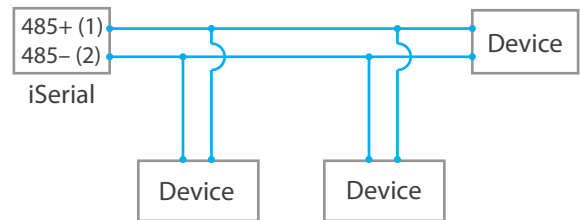
RS-433/485 Pinout: (six terminals from the left)

Terminal No.	1	2	3	4	5	6
RS-422	T+	T-	R+	R-	9-24 VDC	GND
RS-485	485+	485-	485-	485-	9-24 VDC	GND

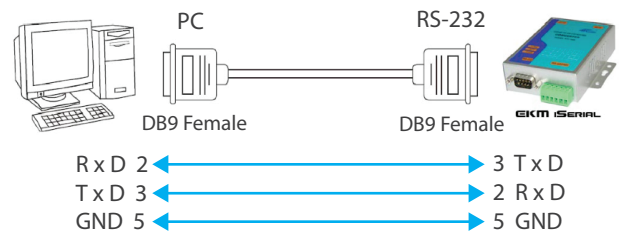
RS-232 Pinout: (DB9 Male)

(DB9 Male)	Signal	I/O
Pin 2	RXD	IN
Pin 3	TXD	OUT
Pin 4	GND	—
Pin 5	RTS	OUT
Pin 6	RTS	IN

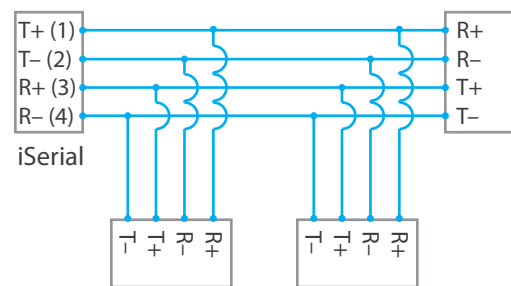
RS-485 Connection



**\*RS-232 Connection**



**\*RS-422 Connection**



\* Not Used for EKM Metering Systems.