



# TDS-5041-I-M12

## EN50155 Industrial Device Server

### User's Manual

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[www.oring-networking.com](http://www.oring-networking.com)



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# Getting to Know Your Device Server

## 1.1 About the TDS-5041-I-M12 Serial Device Server



TDS-5041-I-M12 is an innovative 4 ports RS-422 /485 with isolation to 1 ports LAN device server. Users are able to configure TDS-5041-I-M12 by DS-Tool via LAN port. TDS-5041-I-M12

The TDS-5041-I-M12 can simultaneously transfer data into 5 host PCs. This feature can assure all critical data that saved in different host PCs to avoid Ethernet break or host PCs failure.

TDS-5041-I-M12 also provides NAT pass through function so that users are able to manage

TDS-5041-I-M12 inside or outside the NAT router. It is easy for different IP domain users to use TDS-5041-I-M12. Therefore, TDS-5041-I-M12 is the best communication redundant solution for current application of serial devices.

## 1.2 Software Features

- NAT-pass through: User can manage TDS-5041-I-M12 through NAT router.
- Operating Modes: Virtual Com, Serial Tunnel, TCP Server, TCP Client, UDP
- Redundant multiple host devices:
- 5 host devices: Virtual COM, TCP Server, TCP Client mode;
- 4 IP ranges: UDP
- NAT-pass through: user can manage TDS-5041-I-M12 through NAT router
- Security: SSL data encryption; secured management by HTTPS and SSH: IP Access: IP



#### White List

- Internet Communication: PPPoE
- Update DNS Hostname: DDNS
- Event Warning by Syslog, Email, SNMP trap, Relay and Beeper
- Configurable by Web-based and Windows utility (DS-Tool)
- Various Windows O.S. supported: Windows NT/2000/ XP/ 2003/VISTA(32/64bit)/  
Windows 7(32/64bit) /Windows 8 (32/64bit)

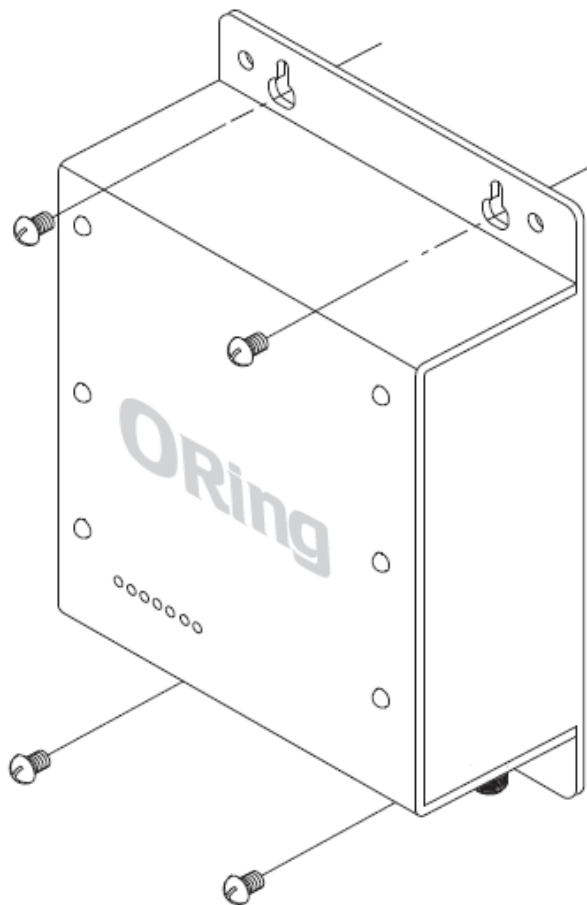
### 1.3 Hardware Features

- Redundant Power Inputs: 12~48 VDC on terminal block and power jack
- Operating Temperature: -40 to 70°C
- Storage Temperature: -40 to 85°C
- Operating Humidity: 5% to 95%, non-condensing
- Casing: IP-40
- 1 10/100Base-T(X) Ethernet port
- 4 isolated serial port
- Dimensions(W x D x H) : 170(W) x 65 (D) x 195(H) mm (6.69 x2.55x7.7.67 inch.)

# Hardware Installation

## 2.1 Wall Mounting Installation

Each TDS-5041-I-M12 has another installation method for you. A wall mount panel can be found in the package. The following steps show how to mount the TDS-5041-I-M12 on the wall:





# Hardware Overview

## 3.1 Front Panel

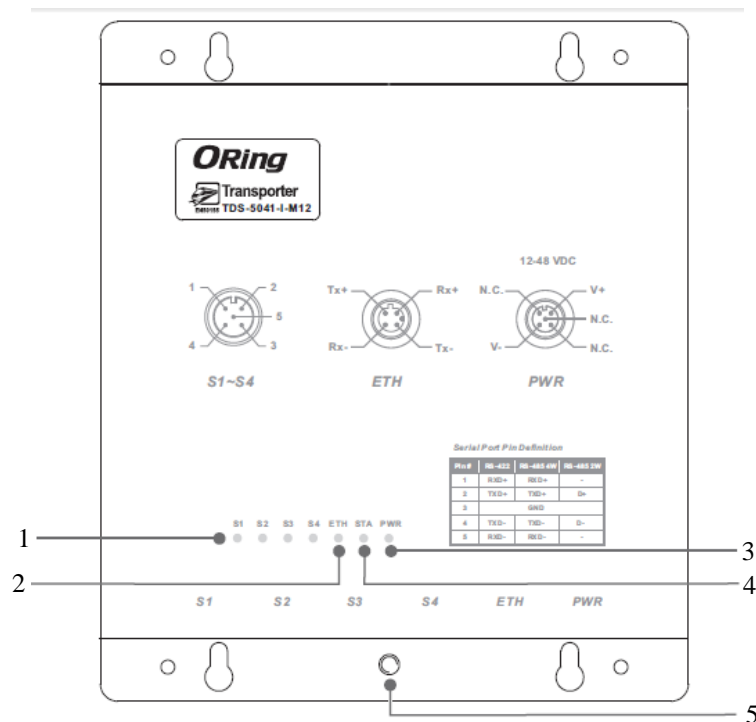


Figure 3-1

1. Serial port LED
2. 10/100M LAN port Indicator
3. Power Indicator.
4. Status LED
5. Ground

## 3.2 Front Panel LEDs

The following table describes the labels that stick on the TDS-5041-I-M12.

LED	Color	Status	Description
PWR	Green/Red	On	DC power activated.
S1 ~ S4	Green	Blinking	Serial port is transmitting data
	Red	Blinking	Serial port is receiving data
ETH	Green/Amber	Green On/Blinking	100Mbps LNK/ACT
		Amber On/Blinking	10Mbps LNK/ACT

Table 3-1 Front panel LEDs

## 3.3 Serial Ports

There 4 serial ports on the front panel of TDS-5041-I-M12 showed as below:



Pin #	RS 422	RS 485 ( 4 wire )	RS 485 ( 2 wire )
1	RXD +	RXD +	-
2	TXD +	TXD +	D+
3	GND		
4	TXD -	TXD -	D -
5	RXD -	RXD -	-

Table 3-2 Pin assignment





### 3.4 Bottom Panel

The bottom panel components of TDS-5041-I-M12/42+/42-I+ are shown as below:

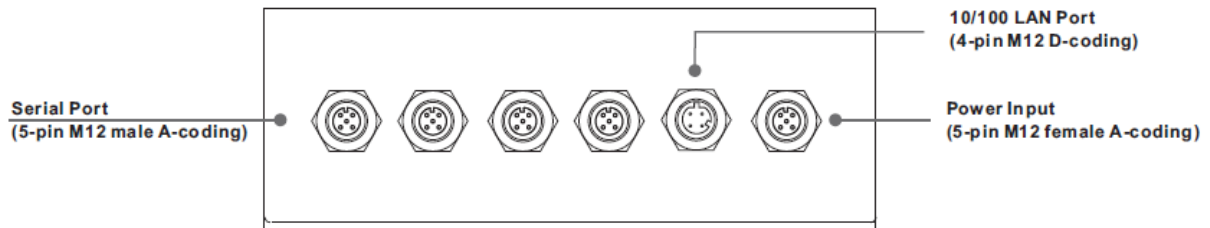


Figure 3-2 Bottom Panel

# Cables

## 4.1 Ethernet Cables

The TDS-5041-I-M12 has standard Ethernet ports. According to the link type, the TDS-5041-I-M12 use CAT 3, 4, 5,5e UTP cables to connect to any other network device (PCs, servers, switches, routers, or hubs). Please refer to the following table for cable specifications.

Cable	Type	Max. Length	Connector
10BASE-T	Cat. 3, 4, 5 100-ohm	UTP 100 m (328 ft)	M12 (D-Coding)
100BASE-TX	Cat. 5 100-ohm UTP	UTP 100 m (328 ft)	M12 (D-Coding)

Table 4-1 Cable Types and Specifications

### 100BASE-TX/10BASE-T Pin Assignments

With 100BASE-TX/10BASE-T cable, pins 1 and 2 are used for transmitting data, and pins 3 and 6 are used for receiving data.



Pin Number	Assignment
1	TX +
2	RX +
3	RX -



4	TX -
---	------

*Table 4-2 ETH Pin Assignments*

The TDS-5041-I-M12 supports auto MDI/MDI-X operation. You can use a straight-through cable to connect PC to TDS-5041-I-M12. The following table below shows the 10BASE-T/100BASE-TX MDI and MDI-X port pin outs.

Pin Number	MDI port	MDI-X port
1	TD+(transmit)	RD+(receive)
2	RD+(receive)	TD+(transmit)
3	RD-(receive)	TD-(transmit)
4	TD-(transmit)	RD-(receive)

*Table 4-2 MDI / MDI-X pins assignment*

**Note:** "+" and "-" signs represent the polarity of the wires that make up each wire pair.

# Management Interface

## 5.1 DS-Tool

DS-Tool is a powerful Windows utility for DS series. It supports device discovery, device configuration, group setup, group firmware update, monitoring functions...etc. It is easy for you to install and configure devices over the network.

### 5.1.1 Install IDS-Tool

Step 1: Execute the Setup program, click “**start**” after selecting the folder for DS-Tool.

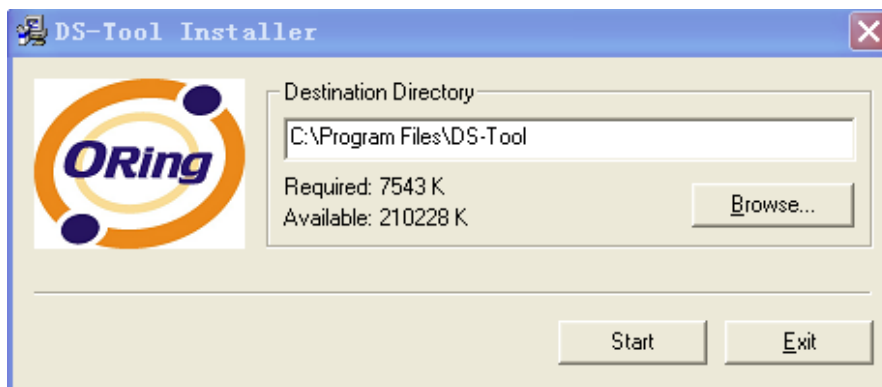


Figure 5-1



Step 2: When installation complete successfully, then click "OK".

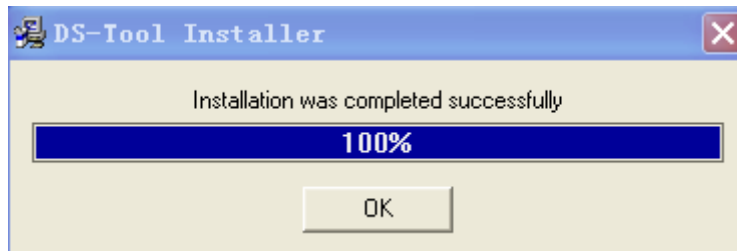


Figure 5-2

Step 3: Check for your selection.



Figure 5-3

## 5.1.2 Using DS-Tool

### 5.1.2.1 Explore device servers

DS-Tool will broadcast to the network and search all available DS devices in the network. The default IP address of device is “**192.168.10.2**”, and selects the searching device you wish to use and press “**Add**” button.

You can set static IP address or in DHCP client mode to get IP address automatically. Finally, click “**OK**” button to add the device.

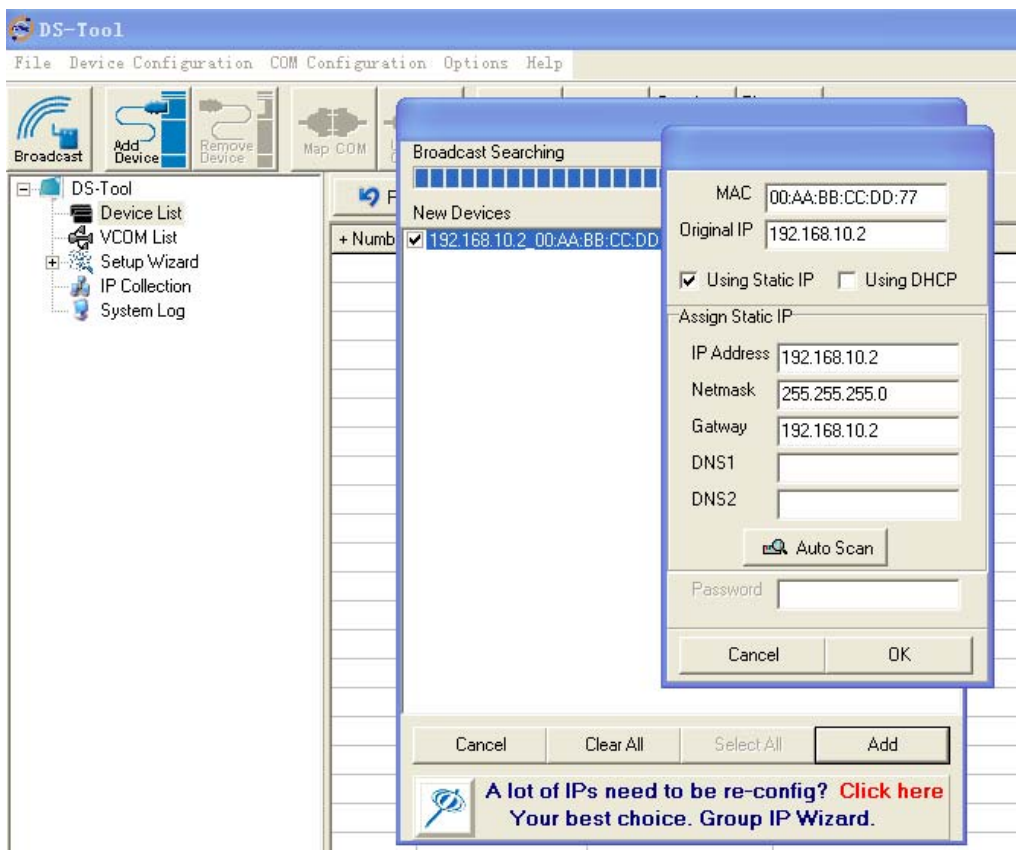


Figure 5-4



## 5.1.2.2 Configure device servers

### General settings

This page includes the setting of device name, SNTP server and Auto IP Report.

Figure 5-5 General settings

The following table describes the labels in this screen.

Label	Description
Device Name/location	You can set the device name or related information. By clicking “Locate On” button you can locate the serial server’s position.
Set SNTP	Input the SNTP server domain name or IP address, port and select the Time zone.



Set Auto IP Report	By Clicking the <b>“Get current Host”</b> button you will get your local IP, and then set the Report interval time. The device server will report its status periodically.
--------------------	--

Table 5-1 General settings

At IP collection option show the device server status. The report interval is 0 indicate disable this setting (default). But you can set the other IP or Port.

### Security

Figure 5-6 Security

The following table describes the labels in this screen.

Label	Description
Accessible IP Setting	To prevent unauthorized access by setting host IP addresses and network masks.





Password setting	You can set the password to prevent unauthorized access from your server. Factory default is no password.
------------------	---

Table 5-2 Security

## Network Setting

Device can connect the Network by wire. You must assign a valid IP address for DS before attached in your network environment. Your network administrator should provide you the IP address and related settings. The IP address must be unique within the network (otherwise, DS will not have a valid connection to the network). You can choose from three possible “**IP configuration**” modes: Static, DHCP/BOOTP. The Factory Default IP address is “**192.168.10.2**”

Figure 5-7 Network Setting



The following table describes the labels in this screen.

Label	Description
Using DHCP/BOOTP	IP Address automatically assigned by a DHCP server in your network.
Static IP Address	Manually assigning an IP address.
Subnet Mask	All devices on the network must have the same subnet mask to communicate on the network.
Gateway	Enter the IP address of the router in you network.
DNS Server	Enter the IP address of the DNS server, The DNS server translates domain names into IP address.

*Table 5-3 Network setting*

## PPPoE

PPPoE (Point-to-Point Protocol over Ethernet), Device can use PPPoE mode to connect the Network. Input the “**username**” and “**Password**”, then click “**Connect**” button. If the device has been connected, the “**Link Status**” will become the “Link up” and device will get an IP address from PPPoE server. Click “**Disconnect**” button to disconnect the PPPoE connection.

A screenshot of a web-based configuration interface for PPPoE settings. The interface has a light beige background. At the top, there are two tabs: "Wire" and "PPPoE", with "PPPoE" being the active tab. Below the tabs is a large rectangular area titled "PPPoE Setting". Inside this area, there are three input fields: "User Name" with an empty text box, "Password" with an empty text box, and "Link Status" with a dropdown menu currently showing "Link down". Below these fields are two buttons: "Connect" and "Disconnect". At the bottom of the interface, there is a horizontal bar containing three buttons: "Refresh" (with a circular arrow icon), "Apply Only" (with a green checkmark icon), and "Apply and Save" (with a green checkmark and a floppy disk icon).

Figure 5-8 PPPoE Setting

## DDNS

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname, allowing your computer to be more easily accessed from various locations on the Internet.

General | Security | Networking | **DDNS** | Notification | Management | Upgrade Firmware | Save/Load

DDNS Enable

DDNS Setting

Service Provider:

Hostname:

Account:

Password:

Check WAN IP Schedule:  Start at  (Hour) :  (Minute)

Figure 5-9 DDNS Setting

The following table describes the labels in this screen.

Label	Description
Service Provider	Choose the DDNS service Provider
Hostname	You must first apply an account from the DDNS service Provider such as www.dyndns.org, then register with the dynamic DNS service. Input the fixed hostname you got from the DDNS service.
Account and Password	Input the Account and Password you have registered from the DDNS service Provider.
Check WAN IP Schedule	Device will check the IP address Status at interval time you set.

Table 5-4 DDNS setting



### Notification

Specify the events that should be notified to the administrator. The events can be alarmed by E-mail, SNMP trap, or system log.

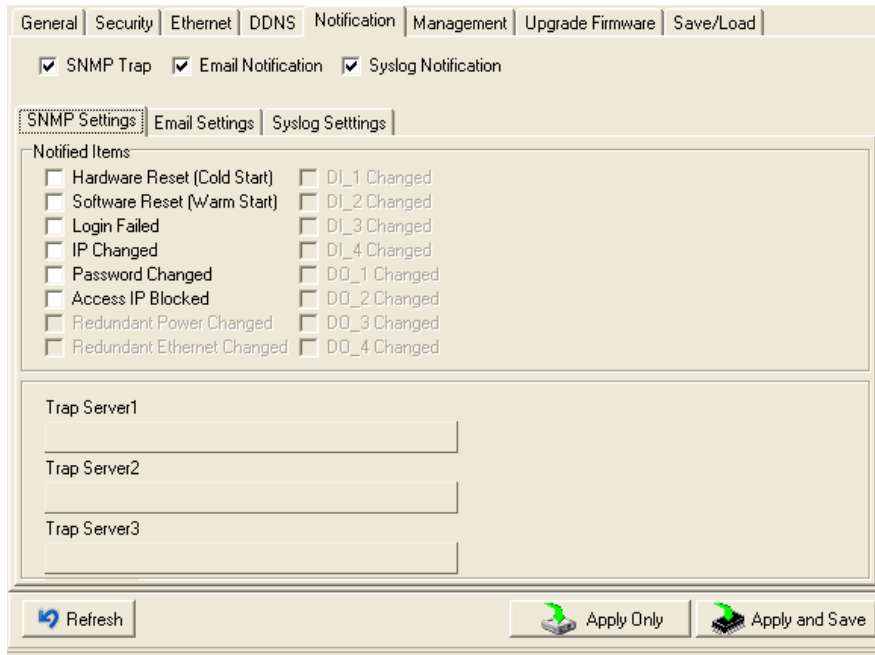


Figure 5-10 Notification

The following table describes the labels in this screen.

Label	Description
SNMP Trap	To notify events by SNMP trap.
Email Notification	To notify events by Email.
Syslog Notification	To notify events by Syslog.
Notify items	Events to be notified.
Apply	Apply current setting.
Apply and Save	Apply and save current setting.

Table 5-5 Notification

## Management

General | Security | Networking | DDNS | Notification | Management | Upgrade Firmware | Save/Load

Web Management Enable Goto Web Management  
 Telnet Management Enable Goto Telnet Management  
 SNMP Management Enable

SNMP Management Settings

Community

Location

Contact

Trap Server1

Trap Server2

Trap Server3

Trap Server4

Refresh
 Apply Only
 Apply and Save

Figure 5-11 Management

The following table describes the labels in this screen.

Label	Description
Web Management Enable	To enable management from Web. Click " <b>Goto Web Management</b> " button to access web.
Telnet Management Enable	To enable management by Telnet. Click " <b>Goto Telnet Management</b> " button to execute Telnet command.
SNMP Management Enable	To enable management by SNMP.
SNMP Management Settings	To configure SNMP related settings.



Table 5-6 Management

### Upgrade Firmware

Figure 5-12 Upgrade Firmware

The following table describes the labels in this screen.

Label	Description
Browsing	Browse the file and upgrade
Upgrade	Enable the firmware upgrade.

Table 5-7 Upgrade Firmware

## Save/Load

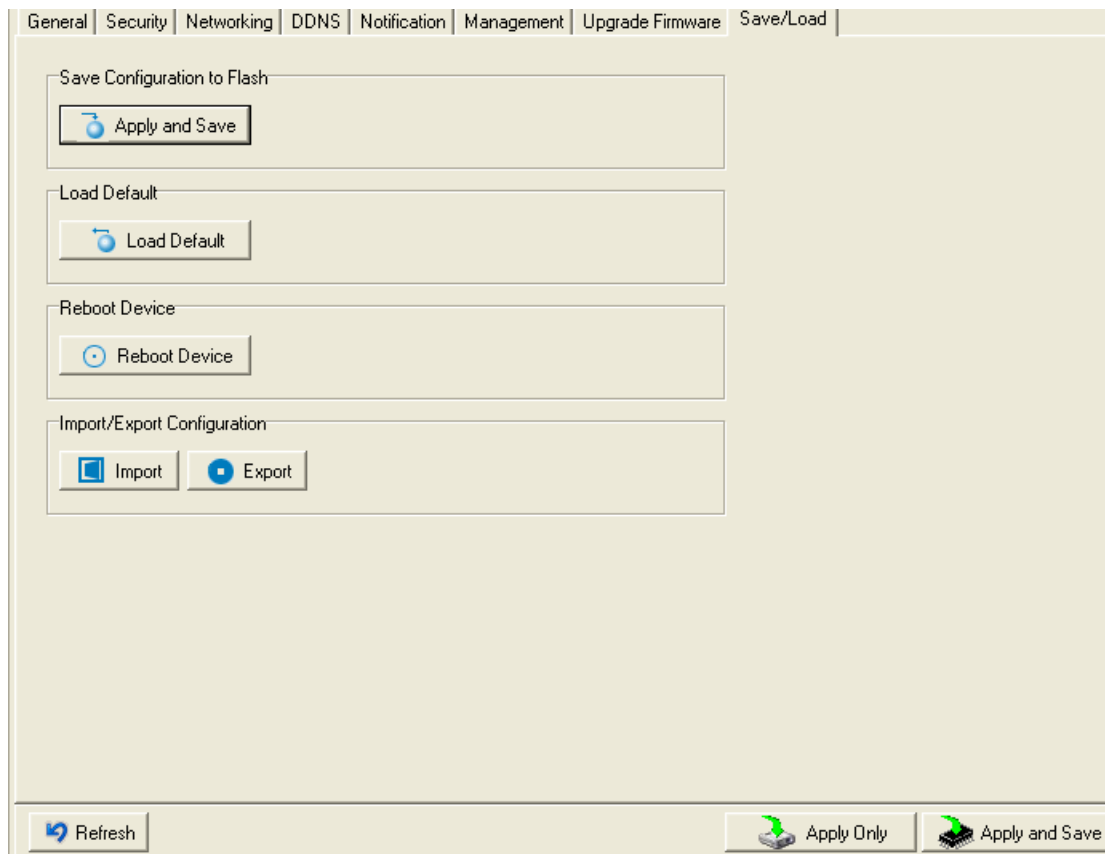


Figure 5-13 Save / Load

The following table describes the labels in this screen.

Label	Description
Save Configuration to Flash	Save current configuration into flash memory.
Load Default	Load default configuration except the network settings. If you want to load all factory default, you need to press " <b>Reset</b> " button on the device (Hardware restore).
Reboot Device	Reboot the device server (warm start).
Import Configuration	Restore the previous exported configuration.





Export Configuration	Exported current configuration to a file to backup the configuration.
----------------------	---

Table 5-8 Save / Load

### 5.1.2.3 Configure serial port

#### Serial Settings

Serial Settings
Service Mode
Notification

port1

Port Alias

Baudrate  Stop Bits  Performance

Parity  Flow Control

Data Bits  Interface

Delimiter Settings

Serial to Ethernet  Ethernet to Serial

Delimiter 1

 (HEX)  
 Enabled

Delimiter 2

 (HEX)  
 Enabled

Delimiter 3

 (HEX)  
 Enabled

Delimiter 4

 (HEX)  
 Enabled

Flush Ethernet to Serial Data Buffer After

 (0-65535) ms
 

The received data will be queuing in the buffer until all the delimiters are matched. When the buffer is full (4K Bytes) or after "flush E2S data buffer" timeout, the data will also be sent.

Refresh
 Apply Only
 Apply and Save

Figure 5-14 Serial Settings



The following table describes the labels in this screen.

Label	Description
Port Alias	Remark the port to hint the connected device.
Interface	RS422 / RS485(2-wires) / RS485(4-wires)
Baud rate	110bps/300bps/1200bps/2400bps/4800bps/9600bps/19200bps/ 38400bps/57600bps/115200bps/230400bps/460800bps
Data Bits	5, 6, 7, 8
Stop Bits	1, 2 (1.5)
Parity	No, Even, Odd, Mark, Space
Flow Control	No, XON/XOFF, RTS/CTS, DTR/DSR
Performance	Throughput: This mode optimized for highest transmission speed. Latency: This mode optimized for shortest response time.
Serial to Ethernet	<p><b>Delimiter:</b> You can define max. 4 delimiters (00~FF, Hex) for each way. The data will be hold until the delimiters are received or the option-"<b>Flush Serial to Ethernet data buffer</b>" times out. 0 means disable. Factory default is 0.</p> <p><b>Flush Data Buffer After:</b> The received data will be queuing in the buffer until all the delimiters are matched. When the buffer is full (4K Bytes) or after "<b>flush S2E data buffer</b>" timeout the data will also be sent. You can set the time from 0 to 65535 seconds.</p>
Ethernet to Serial	<p><b>Delimiter:</b> You can define max. 4 delimiters (00~FF, Hex) for each way. The data will be hold until the delimiters are received or the option "<b>Flush Ethernet to Serial data buffer</b>" times out. 0 means disable. Factory default is 0.</p> <p><b>Flush Data Buffer After:</b> The received data will be queuing in the buffer until all the delimiters are matched. When the buffer is full (4K Bytes) or after "<b>flushE2S data buffer</b>" timeout the data will also be sent. You can set the time from 0 to 65535 seconds.</p>



Force TX Interval Time	<p>Force TX interval time is to specify the timeout when no data has been transmitted.</p> <p>When the timeout is reached or TX buffer is full (4K Bytes), the queued data will be sent.</p> <p>0 means disable. Factory default value is 0.</p>
------------------------	--

Table 5-9 Serial settings

### Service Mode – Virtual COM Mode

In Virtual COM Mode, The driver establishes a transparent connection between host and serial device by mapping the Port of the serial server serial port to local COM port on the host computer. Virtual COM Mode also supports up to 5 simultaneous connections, so that multiple hosts can send or receive data by the same serial device at the same time.

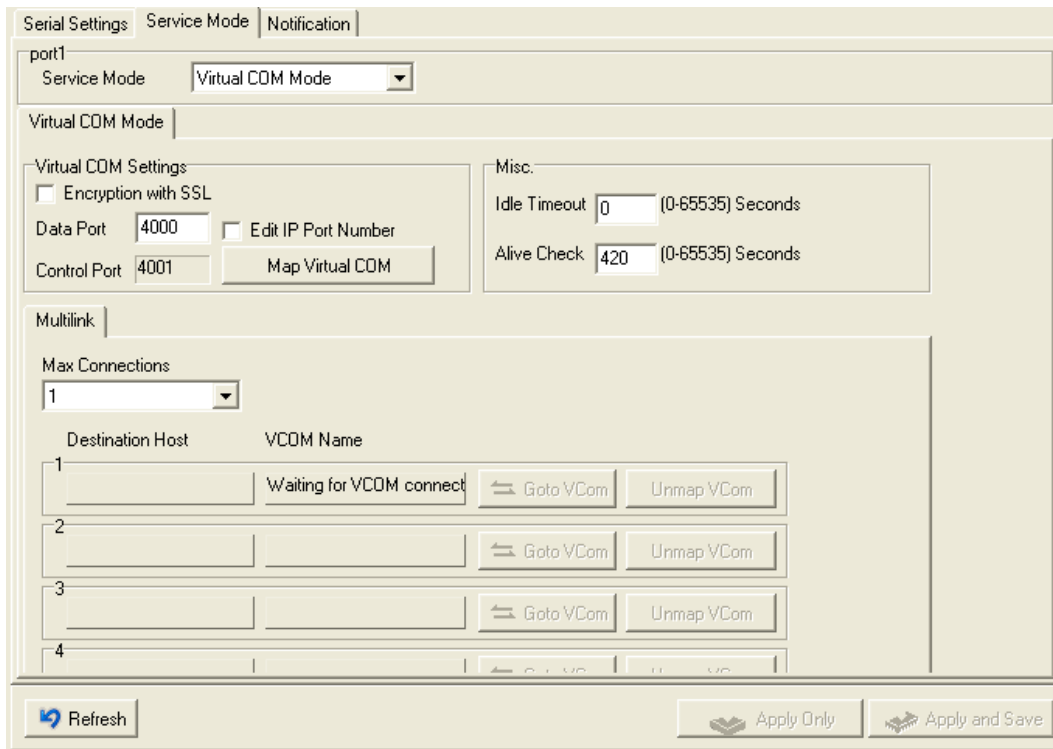


Figure 5-15 Virtual COM



The following table describes the labels in this screen.

Label	Description
Encryption with SSL	Use SSL to encrypt data.
Map Virtual COM	Select a Virtual COM Name to map on.
Max Connection	The number of Max connection can support simultaneous connections are 5, default values is 1.
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.
Alive Check	The serial device will send TCP alive-check package in each defined time interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.

Table 5-10 Virtual COM

*\*Not allowed to mapping Virtual COM from web*

## Service Mode – TCP Server Mode

In TCP Server Mode, DS is configured with a unique Port combination on a TCP/IP network. In this case, DS waits passively to be contacted by the device. After a connection is established, it can then proceed with data transmission. TCP Server mode also supports up to 5 simultaneous connections, so that multiple device can receive data from the same serial device at the same time.



Serial Settings | Service Mode | Notification

port1  
Service Mode: TCP Server Mode

TCP Server Mode

TCP Server Settings

Encryption with SSL     Telnet Negotiation

Data Port: 4000   

Control Port: 4001

Misc.

Idle Timeout: 0 (0-65535) Seconds

Alive Check: 420 (0-65535) Seconds

Multilink

Max Connections: 1   

Destination Host

1:

2:

Figure 5-16 TCP Server mode

The following table describes the labels in this screen.

Label	Description
Encryption with SSL	Use SSL to encrypt data.
Data Port	Set the port number for data transmission.
Telnet Negotiation	Full Telnet command / symbol compatible
Auto Scan	Scan the data port automatically.
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.
Alive Check	The serial device will send TCP alive-check package in each defined time interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.
Max Connection	The number of Max connection can support simultaneous connections are 5, default

	values is 1.
--	--------------

Table 5-11 TCP Server mode

## Service Mode – TCP Client Mode

In TCP Client Mode, device can establish a TCP connection with server by the method you have settled (Startup or any character). After the data has been transferred, device can disconnect automatically from the server by using the TCP alive check time or Idle time settings.

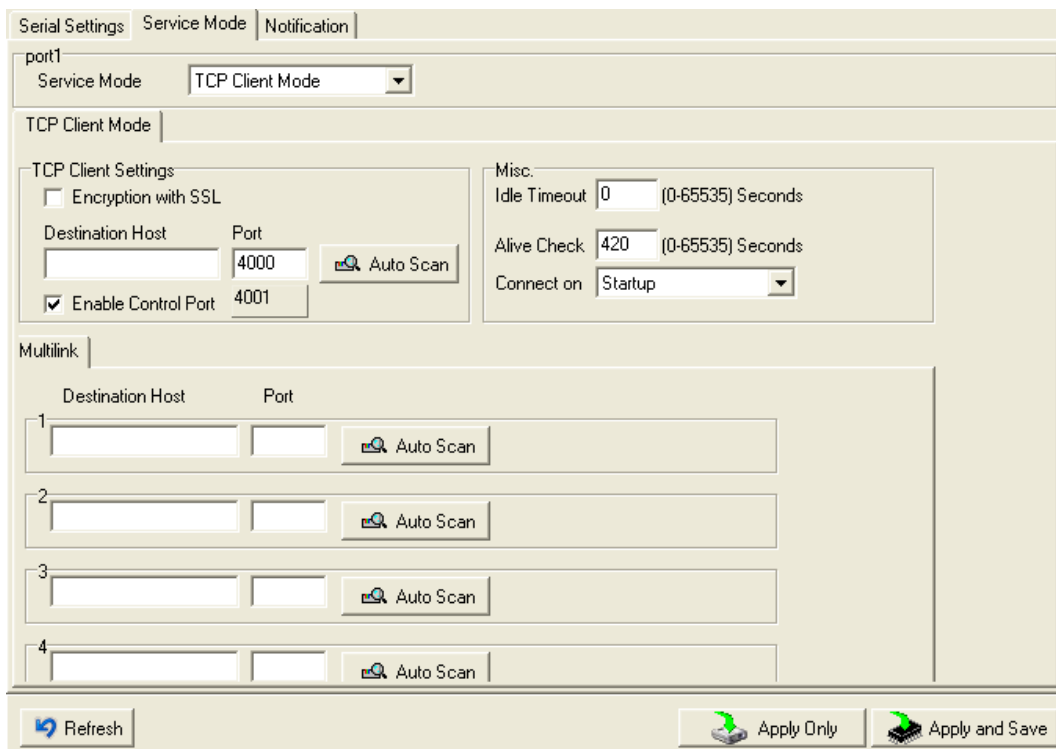


Figure 5-17 TCP Client Mode

The following table describes the labels in this screen.

Label	Description
Encryption with SSL	Use SSL to encrypt data.
Destination Host	Set the IP address of host.

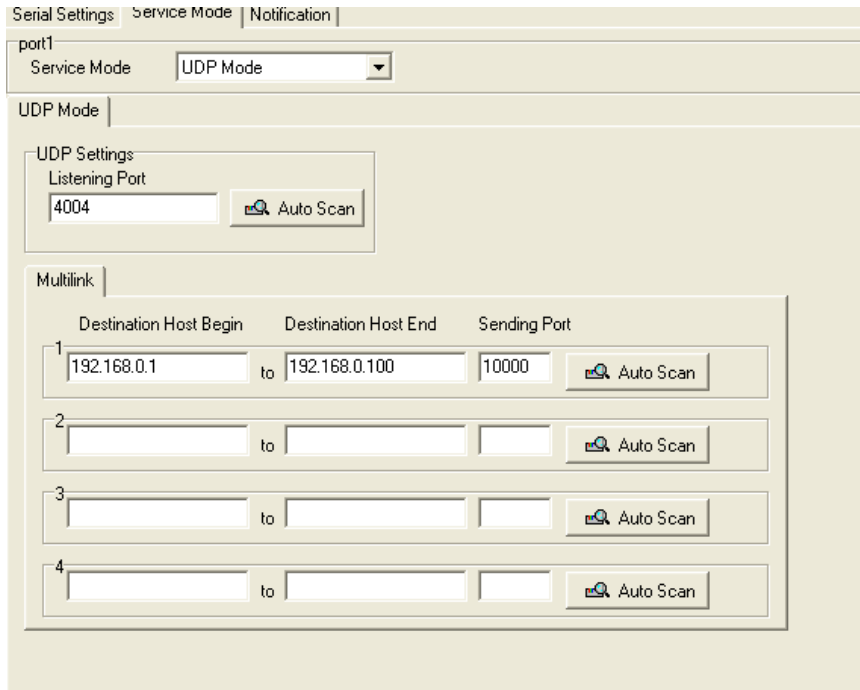


Port	Set the port number of data port.
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.
Alive Check	The serial device will send TCP alive-check package in each defined time interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.
Connect on Startup	The TCP Client will build TCP connection once the connected serial device is started.
Connect on Any Character	The TCP Client will build TCP connection once the connected serial device starts to send data.

*Table 5-12 TCP Client mode*

### **Service Mode – UDP Mode**

Compared to TCP communication, UDP is faster and more efficient. In UDP mode, you can Uni-cast or Multi-cast data from the serial device server to host computers, and the serial device can also receive data from one or multiple host



	Destination Host Begin	Destination Host End	Sending Port	
1	192.168.0.1	to 192.168.0.100	10000	Auto Scan
2		to		Auto Scan
3		to		Auto Scan
4		to		Auto Scan

Figure 5-18 UDP mode

## Notification

Specify the events that should be noticed. The events can be noticed by E-mail, SNMP trap or system log.





Serial Settings | Service Mode | Notification

SNMP Trap     Email Notification     Syslog Notification

SNMP Settings | Email Settings | Syslog Settings

Notified Items

DCD Changed     CTS Changed  
 DSR Changed     Port Connected  
 RI Changed     Port Disconnected

Trap Server1  
 Trap Server2  
 Trap Server3  
 Trap Server4

Refresh    Apply Only    Apply and Save

Figure 5-19 Notification

The following table describes the labels in this screen.

Label	Description
Port connected	In TCP Server Mode, when the device accepts an incoming TCP connection, this event will be trigger. In TCP Client Mode, when the device has connected to the remote host, this event will be trigger. In Virtual COM Mode, Virtual COM is ready to use. A notification will be sent.
Port disconnected	In TCP Server/Client Mode, when the device lost the TCP link, this event will be trigger. In Virtual COM Mode, When Virtual COM is not available, this event will be trigger. A notification will be sent.

Table 5-13 Notification

## 5.2 Configuration by Web Browser

### 5.2.1 CONNECT TO THE WEB PAGE

Step 1: Input the IP address of DS with “<https://192.168.10.2>” in the Address input box of

IE.

Step 2: Click “Yes” button on the dialog box.



*Figure 5-20 Certificate*



Step 3: Input the name and password, then click "OK".

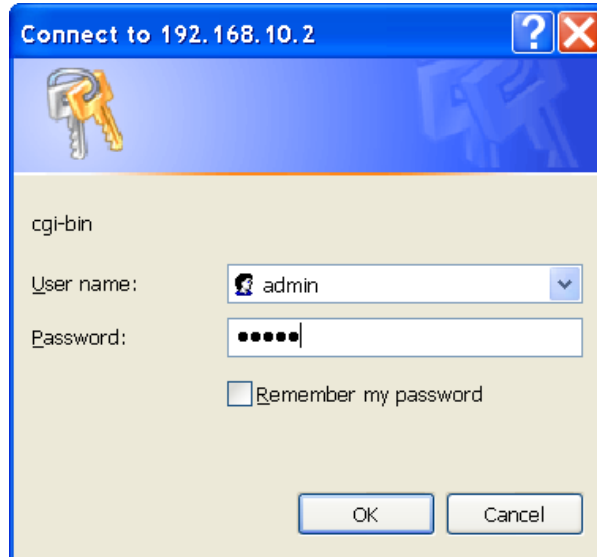


Figure 5-21 Certificate

*\*Only if password is set.*

Step 4: The system information will be shown as below.



Figure 5-21 System information

## 5.2.1.1 System

### Time (SNTP)



The screenshot shows the 'SNTP Configuration' page in the Industrial Device Server web interface. The page has a dark blue header with the ORing logo and the text 'Industrial Device Server'. Below the header, it displays 'Firmware Ver: 2.0 | Uptime: 04:33:47' and 'www.oring-networking.com'. A sidebar menu on the left lists various configuration options, with 'Time(SNTP)' selected. The main content area contains the following configuration fields:

- Name:** DeviceServer-DEFAULT
- Time:**
  - SNTP:**  Enable  Disable
  - Time Zone:** (GMT+08:00)Taipei
  - Local Time:** Wed Feb 20 2013 12:35:21 GMT+
  - Time Server:** pool.ntp.org Port 123
- Console:**
  - Telnet Console:**  Enable  Disable

An 'Apply' button is located at the bottom of the configuration area.

Figure 5-22 Time (SNTP)

The following table describes the labels in this screen.

Label	Description
Name	You can set the name of DS.
SNTP	Enable the SNTP server.
Time zone	After you set the SNTP enable, select the time zone you located.
Time server	Input SNTP server domain name or IP address and Port.
Console	Telnet Console (SSH) is included for security reasons. In some cases, you may need to disable this function to prevent unauthorized access from internet. The factory default is enable.

Table 5-14 Time (SNTP)

### IP Configuration



You must assign a valid IP address for DS before attached in your network environment. Your network administrator should provide you with the IP address and related settings. The IP address must be unique and within the network (otherwise, DS will not have a valid connection to the network). You can choose from three possible “**IP configuration**” modes: Static, DHCP/BOOTP. The Factory Default IP address is “**192.168.10.2**”

The screenshot shows the web interface for the ORing Industrial Device Server. The main content area is titled "IP Configuration" and contains a table of settings. The left sidebar shows a navigation menu with options like "Serial Device Server", "System", "Time(SNTP)", "IP Configuration", "Wireless Configuration", "DDNS Configuration", "User Authentication", "Port Serial Setting", "Management", "Save/Reboot", and "Help".

IP Configuration	
Network Interface	LAN
IP Configuration	Static
IP Address	192.168.10.2
Netmask	255.255.255.0
Gateway	192.168.10.1
DNS Server 1	192.168.10.1
DNS Server 2	
Auto IP Report	
Auto Report to IP	
Auto Report to TCP Port	0
Auto Report Interval	0 seconds

Figure 5-23 IP configuration



The following table describes the labels in this screen.

Label	Description
DHCP/BOOTP	Obtain the IP address automatically from DHCP server.
Static IP Address	Assigning an IP address manually.
Subnet Mask	Set the subnet mask to communicate on the network.
Gateway	Enter the IP address of the router in you network.
DNS Server	Enter the IP address of the DNS server to translate domain names into IP address.
Auto IP Report	The device server will report its status periodically. At DS-Tool->IP collection option show the device server status. The report interval is 0 indicate disable this setting (default). But you can set the other IP or Port.

*Table 5-15 IP configuration*

## PPPoE setting

PPPoE (Point-to-Point Protocol over Ethernet), Device can use PPPoE mode to connect the Network. Input the “**username**” and “Password”, then click “**Connect**” button. If the device has been connected, the “**Status**” will become the “**Link up**” and device will get an IP address from PPPoE server. Click “Return” button, return the “**IP Configuration**” default page.



**Industrial Device Server**

Firmware Ver: 1.0c | Uptime: 00:00:21 www.oring-networking.com

open all

- Serial Device Server
- System
  - Time(SNTP)
  - IP Configuration
  - Wireless Configuration
  - DDNS Configuration
  - User Authentication
- Port Serial Setting
- Management
  - Save/Reboot
  - Help

**PPPoE Setting**

User Name	<input type="text"/>
Password	<input type="password"/>
Status	Link down

Figure 5-24 PPPoE setting.

## DDNS Configuration

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname, allowing your computer to be more easily accessed from various locations on the Internet.

**Industrial Device Server**

Firmware Ver: 1.0c | Uptime: 00:00:21 www.oring-networking.com

open all

- Serial Device Server
- System
  - Time(SNTP)
  - IP Configuration
  - Wireless Configuration
  - DDNS Configuration
  - User Authentication
- Port Serial Setting
- Management
  - Save/Reboot
  - Help

**DDNS Configuration**

DDNS	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Service Provider	ezip <input type="button" value="v"/>
Host Name	<input type="text"/>
Account	<input type="text"/>
Password	<input type="password"/>
Check WAN IP Schedule	Every Hour <input type="button" value="v"/> start at <input type="text" value="0"/> : <input type="text" value="0"/>

Figure 5-26 DDNS setting



The following table describes the labels in this screen.

Label	Description
Service Provider	Choose the DDNS service Provider
Hostname	You must first apply an account from the DDNS service Provider such as www.dyndns.org, then register with the dynamic DNS service. Input the fixed hostname you got from the DDNS service.
Account and Password	Input the Account and Password you have registered from the DDNS service Provider.
Check WAN IP Schedule	Device will check the IP address Status at interval time you set.

*Table 5-16 DDNS Setting*





## Authentication

You can set the password to prevent unauthorized access from network. Input the “**Old password**” and “**New password**” to change the password. Factory default is no password.

The screenshot displays the web interface for an Industrial Device Server. The header includes the ORing logo, the title "Industrial Device Server", and status information: "Firmware Ver: 1.0c | Uptime: 00:04:50" and "www.oring-networking.com". A left-hand navigation menu lists various settings categories. The main content area is titled "User Authentication" and contains three input fields for "Old Password", "New Password", and "Confirm New Password", each with a corresponding label. An "Apply" button is located below the input fields.

Old Password	<input type="text"/>
New Password	<input type="text"/>
Confirm New Password	<input type="text"/>

Figure 5-27 Authentication

## 5.2.1.2 Port serial setting

### Serial configuration



**Industrial Device Server**

Firmware Ver. 1.0c | Uptime: 00:04:50 www.oring-networking.com

**Serial Configuration**

Port1	
Port Alias	Port0
Interface	RS232
Baud Rate	38400
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	None
Force TX Interval Time	0 ms
Performance	<input checked="" type="radio"/> Throughput <input type="radio"/> Latency

Apply

Figure 5-28 Serial configuration

The following table describes the labels in this screen.

Label	Description
Port Alias	Remark the port to hint the connected device.
Interface	RS422 / RS485(2-wires) / RS485(4-wires)
Baud rate	110bps/300bps/1200bps/2400bps/4800bps/9600bps/19200bps/ 38400bps/57600bps/115200bps/230400bps/460800bps
Data Bits	5, 6, 7, 8
Stop Bits	1, 2 (1.5)
Parity	No, Even, Odd, Mark, Space



Flow Control	No, XON/XOFF, RTS/CTS, DTR/DSR
Force TX Interval Time	Force TX interval time is to specify the timeout when no data has been transmitted. When the timeout is reached or TX buffer is full (4K Bytes), the queued data will be sent. 0 means disable. Factory default value is 0.
Performance	Throughput: This mode optimized for highest transmission speed. Latency: This mode optimized for shortest response time.
Apply	Activate settings on this page.

Table 5-18 Serial configuration

### Port Profile

The screenshot shows the ORing Industrial Device Server web interface. The top header includes the ORing logo, the text "Industrial Device Server", and the status "Firmware Ver: 1.0c | Uptime: 00:04:50" and "www.oring-networking.com". The left navigation menu is expanded to show "Port Profile" under "Port Serial Setting". The main content area is titled "Port Profile" and contains a table for "Port1" configuration:

	Port1
Local TCP Port	4002
Command Port	4003
Mode	Serial to Ethernet
Flush Data Buffer After	0 ms
Delimiter(Hex 0~ff)	1: 00 2: 00 3: 00 4: 00
Mode	Ethernet to Serial
Flush Data Buffer After	0 ms
Delimiter(Hex 0~ff)	1: 00 2: 00 3: 00 4: 00

Below the table is an "Apply" button.

Figure 5-29 Port Profile



The following table describes the labels in this screen.

Label	Description
Serial to Ethernet	<p><b>Flush Data Buffer After:</b></p> <p>The received data will be queued in the buffer until all the delimiters are matched. When the buffer is full (4K Bytes) or after "<b>flush S2E data buffer</b>" timeout, the data will also be sent. You can set the time from 0 to 65535 seconds.</p> <p><b>Delimiter:</b></p> <p>You can define max. 4 delimiters (00~FF, Hex) for each way. The data will be hold until the delimiters are received or the option "<b>Flush Serial to Ethernet data buffer</b>" times out. 0 means disable. Factory default is 0</p>
Ethernet to serial	<p><b>Flush Data Buffer After:</b></p> <p>The received data will be queued in the buffer until all the delimiters are matched. When the buffer is full (4K Bytes) or after "<b>flush E2S data buffer</b>" timeout, the data will also be sent. You can set the time from 0 to 65535 seconds.</p> <p><b>Delimiter:</b></p> <p>You can define max. 4 delimiters (00~FF, Hex) for each way. The data will be hold until the delimiters are received or the option "<b>Flush Ethernet to Serial data buffer</b>" times out. 0 means disable. Factory default is 0</p>

Table 5-18 Port Profile



## Service Mode – Virtual COM Mode

In Virtual COM Mode, the driver establishes a transparent connection between host and serial device by mapping the Port of the serial server serial port to local COM port on the host computer. Virtual COM Mode also supports up to 5 simultaneous connections, so that multiple hosts can send or receive data by the same serial device at the same time.



Figure 5-30 Virtual COM mode

The following table describes the labels in this screen.

Label	Description
Data Encryption	Use SSL to encrypt data.
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.



Alive Check	The serial device will send TCP alive-check package in each defined time interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.
Max Connection	The number of Max connection can support simultaneous connections are 5, default values is 1.

Table 5-19 Virtual COM mode

\*Not allowed to mapping Virtual COM from web

## Service Mode – TCP Server Mode

In TCP Server Mode, DS is configured with a unique Port combination on a TCP/IP network. In this case, DS waits passively to be contacted by the device. After the device establishes a connection with the serial device, it can then proceed with data transmission. TCP Server mode also supports up to 5 simultaneous connections, so that multiple device can receive data from the same serial device at the same time.

	Port1
Data Encryption	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Service Mode	TCP Server Mode
Telnet Negotiation	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
TCP Server Port	4002
Idle Timeout	0 (0~65535)seconds
Alive Check	420 (0~65535)seconds
Max Connection	1 max. connection(1~5)

Apply

Figure 5-31 TCP Server Mode



The following table describes the labels in this screen.

Label	Description
Data Encryption	Use SSL to encrypt data.
Telnet Negotiation	Full Telnet command / symbol compatible
TCP Server Port	Set the port number for data transmission.
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.
Alive Check	The serial device will send TCP alive-check package in each defined time interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.
Max Connection	The number of Max connection can support simultaneous connections are 5, default values is 1.

*Table 5-20 TCP server mode*

### **Service Mode – TCP Client Mode**

In TCP Client Mode, device can establish a TCP connection with server by the method you set (Startup or any character). After the data has been transferred, device can disconnect automatically from the server by using the TCP alive check time or Idle timeout settings.

The screenshot shows the 'Service Mode' configuration page for 'Port1'. The interface includes a navigation menu on the left with options like 'Serial Device Server', 'System', 'Time(SNTP)', 'IP Configuration', 'Wireless Configuration', 'DDNS Configuration', 'User Authentication', 'Port Serial Setting', 'Serial Configuration', 'Port Profile', 'Service Mode', 'Management', 'Save/Reboot', and 'Help'. The main configuration area is titled 'Service Mode' and contains the following settings:

- Data Encryption:** Radio buttons for 'Enable' and 'Disable' (selected).
- Service Mode:** A dropdown menu set to 'TCP Client Mode'.
- Destination Host:** A text input field followed by a port number '4002'.
- Idle Timeout:** A text input field set to '0' with a range '(0~65535)seconds'.
- Alive Check:** A text input field set to '420' with a range '(0~65535)seconds'.
- Connect on:** Radio buttons for 'Startup' (selected) and 'Any Character'.
- Destination Host Table:** A table with 4 rows, each with a 'Destination Host' input field and a 'Port' input field set to '65535'.

An 'Apply' button is located at the bottom of the configuration area.

Figure 5-32 TCP client mode

The following table describes the labels in this screen.

Label	Description
Data Encryption	Use SSL to encrypt data.
Destination Host	Set the IP address of host and the port number of data port. .
Idle Timeout	When serial port stops data transmission for a defined period of time (Idle Timeout), the connection will be closed and the port will be freed and try to connect with other hosts. 0 indicate disable this function. Factory default value is 0. If Multilink is configured, only the first host connection is effective for this setting.
Alive Check	The serial device will send TCP alive-check package in each defined time interval (Alive Check) to remote host to check the TCP connection. If the TCP connection is not alive, the connection will be closed and the port will be freed. 0 indicate disable this function. Factory default is 0.





Connect on Startup	The TCP Client will build TCP connection once the connected serial device is started.
Connect on Any Character	The TCP Client will build TCP connection once the connected serial device starts to send data.

Table 5-21 TCP client mode

### Service Mode – UDP Client Mode

Compared to TCP communication, UDP is faster and more efficient. In UDP mode, you can Uni-cast or Multi-cast data from the serial device server to host computers, and the serial device can also receive data from one or multiple host

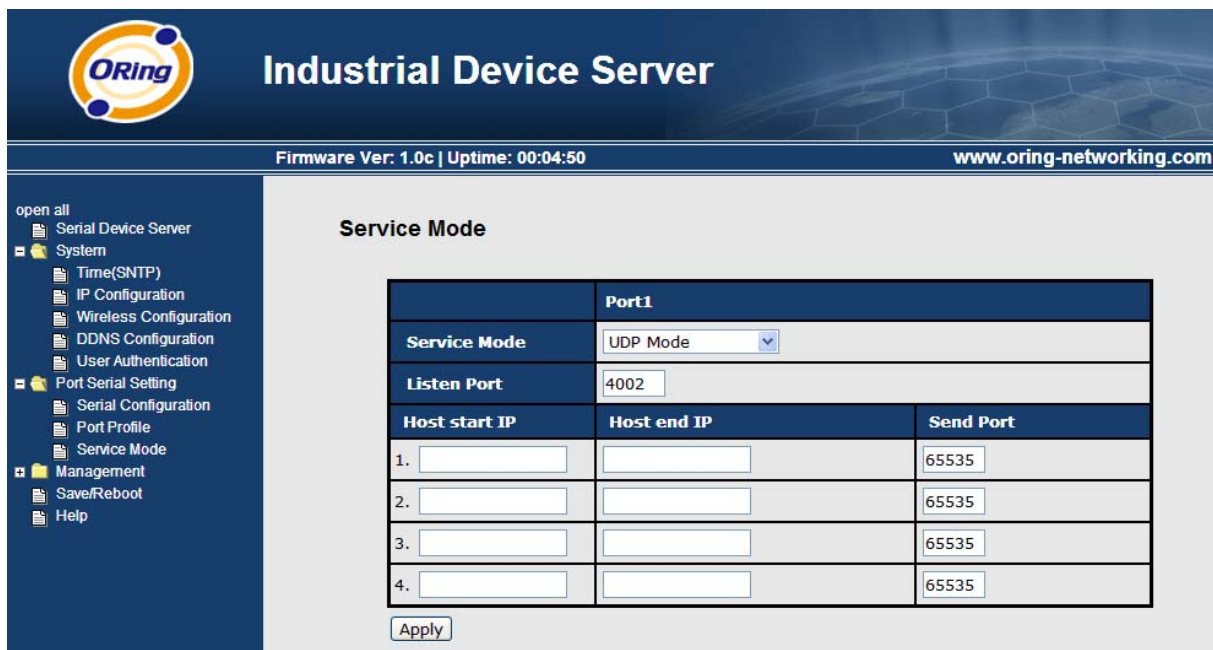


Figure 5-33 UDP client mode

## 5.2.1.3 Management

### Access IP Control

Access IP Control Settings allow you to add or block the remote host IP addresses to prevent unauthorized access. If host's IP address is in the accessible IP table, then the host will be allowed to access the DS. You can choose one of the following cases by setting the parameter.

1. Only one host with a special IP address can access the device server, "IP address /255.255.255.255" (e.g., "192.168.0.1/255.255.255.255").
2. Hosts on a specific subnet can access the device server. "IP address/255.255.255.0" (e.g., "192.168.0.2/255.255.255.0")
3. Any host can access the device server. Disable this function by un-checking the "Enable IP Filter" checkbox



The screenshot shows the web interface for the Industrial Device Server. The page title is "Industrial Device Server" and the firmware version is 1.0c. The left sidebar contains a navigation menu with categories like System, Port Serial Setting, and Management. The main content area is titled "Access IP Control List" and features a checkbox for "Enable IP Filtering (Not check this option will allow any IP to have accessibility)". Below this is a table with 16 rows, each representing a configuration entry. Each row has columns for "No.", "Activate the IP", "IP Address", and "Netmask".

No.	Activate the IP	IP Address	Netmask
1	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
2	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
3	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
4	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
5	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
6	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
7	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
8	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
9	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
10	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
11	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
12	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
13	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
14	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
15	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
16	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>

Figure 5-34 Access IP



## SMTP/SNMP Conf

Email Server configuration includes the mail server's IP address or domain. If the authentication is required, specify your name and password. There are 4 Email addresses that you can specify to receive the notification.

SNMP Server configuration includes the SNMP Trap Server IP address, Community, Location and Contact. There are 4 SNMP addresses you can specify to receive the notification.

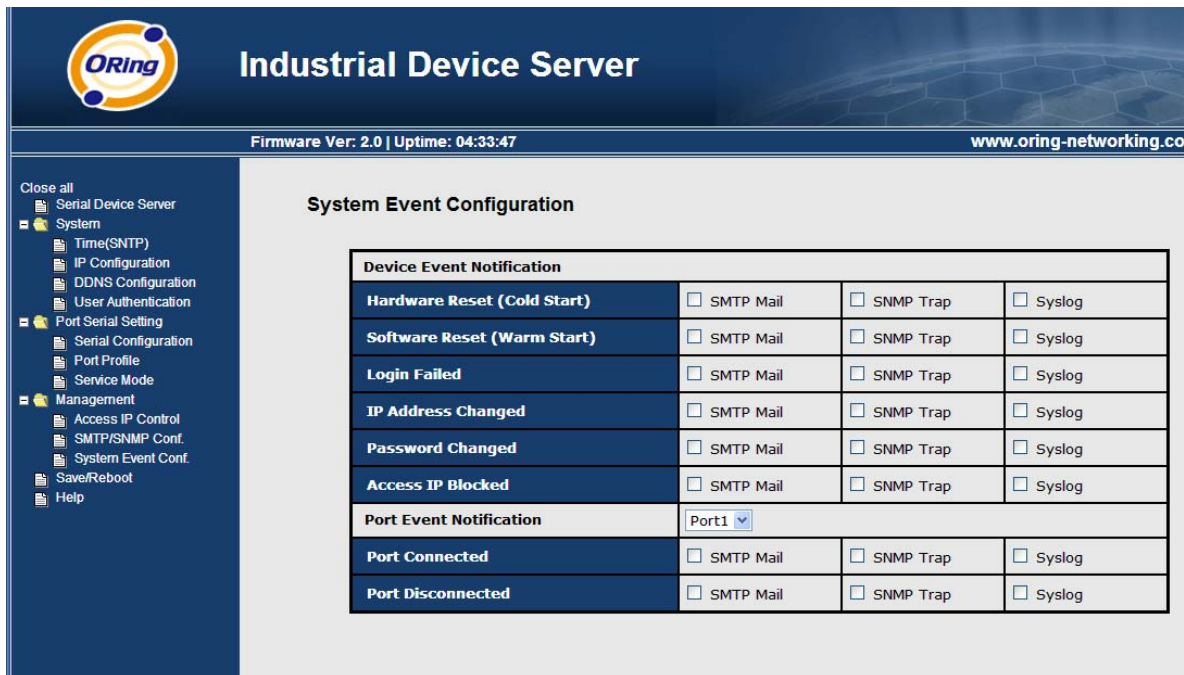
SysLog server configuration includes the server IP and server Port. This option need to use with DS-Tool.



Figure 5-35 SMTP / SNMP conf

## System Event Conf

Specify the events that should be notified to the administrator. The events can be alarmed by E-mail, SNMP trap, or system log.



The screenshot shows the 'System Event Configuration' page. It features a table for configuring notifications for various events. The table has columns for the event name and checkboxes for SMTP Mail, SNMP Trap, and Syslog. A 'Port Event Notification' section includes a dropdown menu for selecting a port.

Device Event Notification			
Hardware Reset (Cold Start)	<input type="checkbox"/> SMTP Mail	<input type="checkbox"/> SNMP Trap	<input type="checkbox"/> Syslog
Software Reset (Warm Start)	<input type="checkbox"/> SMTP Mail	<input type="checkbox"/> SNMP Trap	<input type="checkbox"/> Syslog
Login Failed	<input type="checkbox"/> SMTP Mail	<input type="checkbox"/> SNMP Trap	<input type="checkbox"/> Syslog
IP Address Changed	<input type="checkbox"/> SMTP Mail	<input type="checkbox"/> SNMP Trap	<input type="checkbox"/> Syslog
Password Changed	<input type="checkbox"/> SMTP Mail	<input type="checkbox"/> SNMP Trap	<input type="checkbox"/> Syslog
Access IP Blocked	<input type="checkbox"/> SMTP Mail	<input type="checkbox"/> SNMP Trap	<input type="checkbox"/> Syslog
Port Event Notification			
	Port1		
Port Connected	<input type="checkbox"/> SMTP Mail	<input type="checkbox"/> SNMP Trap	<input type="checkbox"/> Syslog
Port Disconnected	<input type="checkbox"/> SMTP Mail	<input type="checkbox"/> SNMP Trap	<input type="checkbox"/> Syslog

Figure 5-36 SMTP / SNMP conf

The following table describes the labels in this screen.

Label	Description
Hardware Reset (Cold Start)	This refers to starting the system from power off (contrast this with warm start). When performing a cold start, DS will automatically issue an Auto warning message by sending E-mail, log information or an SNMP trap after booting.
Software Reset (Warm Start)	This refers to restart the computer without turning the power off. When performing a warm start, DS will automatically send an E-mail, log information or SNMP trap after reboot.
Login Failed	When an unauthorized access from the Console or Web interface, a notification will be



	sent.
IP Address Changed	When IP address of device changed, a notification will be sent.
Password Changed	When password of device changed, a notification will be sent.
Access IP Blocked	When the host accesses the device with blocked IP addresses, a notification will be sent.
Port connected	In TCP Server Mode, when the device accepts an incoming TCP connection, this event will be trigger. In TCP Client Mode, when the device has connected to the remote host, this event will be trigger. In Virtual COM Mode, Virtual COM is ready to use. A notification will be sent.
Port disconnected	In TCP Server/Client Mode, when the device lost the TCP link, this event will be trigger. In Virtual COM Mode, When Virtual COM is not available, this event will be trigger. A notification will be sent.
Power 1 Fault	When Power 1 Fault, a notification will be sent and the Fault LED will be turned on.
Power 2 Fault	When Power 2 Fault, a notification will be sent and Fault LED will be turned on.
Eth1 link down	When Eth1 link down, a notification will be sent and Fault LED will be turned on.
Eth2 link down	When Eth2 link down, a notification will be sent and Fault LED will be turned on.

*Table 5-22 System event conf*

#### **5.2.1.4 Save/Reboot**



Figure 5-37 Save / Reboot

The following table describes the labels in this screen.

Label	Description
Factory Default	Load default configuration except settings of Network. If you want load all factory default, you should press "Reset" button about the five seconds on the device (Hardware restore).
Restore Configuration	Restore the previous exported configuration.
Backup Configuration	Export the current configuration to a file.
Upgrade Firmware	Upgrade to a new firmware with specified file.
Reboot Device	Reboot the device server (warm start).

Table 5-23 Save / Reboot

## 5.3 Configuration by SSH Console

### 5.3.1 Connect to DS

You can use SSH Tool (e.g., PUTTY) to access SSH console of DS. The SSH console interface is



shown below.

```
login as: admin
admin@192.168.0.75's password:

*****
*** ORING Industrial Serial Device Server Commander ***
*****

Input System Password: ****
Password confirmed. Starting Main Menu.
-----
[ORING Industrial Serial Device Server Commander]
1. Overview
2. General Settings
3. Network Settings
4. Ports settings
5. Security(Accessible IP) Settings
6. Notification(Auto Warning) Settings
7. Wireless config setting
8. Wireless network setting
A. DDNS setting
C. Change Password
L. Load Factory Default
S. Save configuration
R. Reboot
Q. Exit & Logout

Select one function (1-6,C,L,S,R,Q): █
```

Figure 5-38 SSH



# Technical Specifications

<b>ORing Device Server Model</b>	TDS-5041-I-M12
<b>Physical Ports</b>	
10/100 Base-T(X) Ports in M12 Auto MDI/MDIX	1 (4-pin D-Coding in female connector)
<b>Serial Ports</b>	
Connector	M12 x 4 (5-pin A-coding in male connector)
Operation Mode	RS-422 / 4(2)-Wire RS-485. Which can be configured by DS-Tool
Serial Baud Rate	110 bps to 460.8 Kbps
Data Bits	5, 6, 7, 8
Parity	odd, even, none, mark, space
Stop Bits	1, 1.5, 2
RS-232	TxD, RxD, GND
RS-485 (2-wire)	Data+, Data-, GND
Flow Control	XON/XOFF
Isolation	2KVDC
<b>Network Protocol</b>	
Protocol	ICMP, IP, TCP, UDP, DHCP, BOOTP, SSH, DNS, SNMP V1/V2c, HTTPS, SMTP, DDNS, PPPoE
<b>LED Indicators</b>	
Power Indicator	Red On: Power is on and booting up. Red Blinking: Indicates an IP conflict, or DHCP or BOOTP server did not respond properly. Green On: Power is on and functioning Normally. Green Blinking: Located by Administrator.
10/100TX Port indicator	Green for port Link/Act at 100Mbps. Amber for port Link/Act at 10Mbps.
Serial TX / RX LEDs:	Red: Serial port is receiving data Green: Serial port is transmitting data
<b>Power</b>	
Input Power	Power Inputs. 12-48VDC x 1(5-pin M12 female in A-coding)
Power consumption (Typ.)	5.5
Overload current protection	Present
<b>Physical Characteristic</b>	
Enclosure	IP-40
Dimension (W x D x H)	170(W) x 65 (D) x 195(H) mm (6.69 x2.55x7.7.67 inch.)
Weight (g)	950g
<b>Environmental</b>	





Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 70°C (-40 to 158°F)
Operating Humidity	5% to 95% Non-condensing
<b>Regulatory Approvals</b>	
EMI	FCC Part 15, CISPR (EN55022) class A, EN50155 (EN50121-3-2)
EMS	EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-6 (CS), EN61000-4-8, EN61000-4-11
Shock	IEC60068-2-27, EN61373
Free Fall	IEC60068-2-32
Vibration	IEC60068-2-6, EN61373
<b>Warranty</b>	5 years