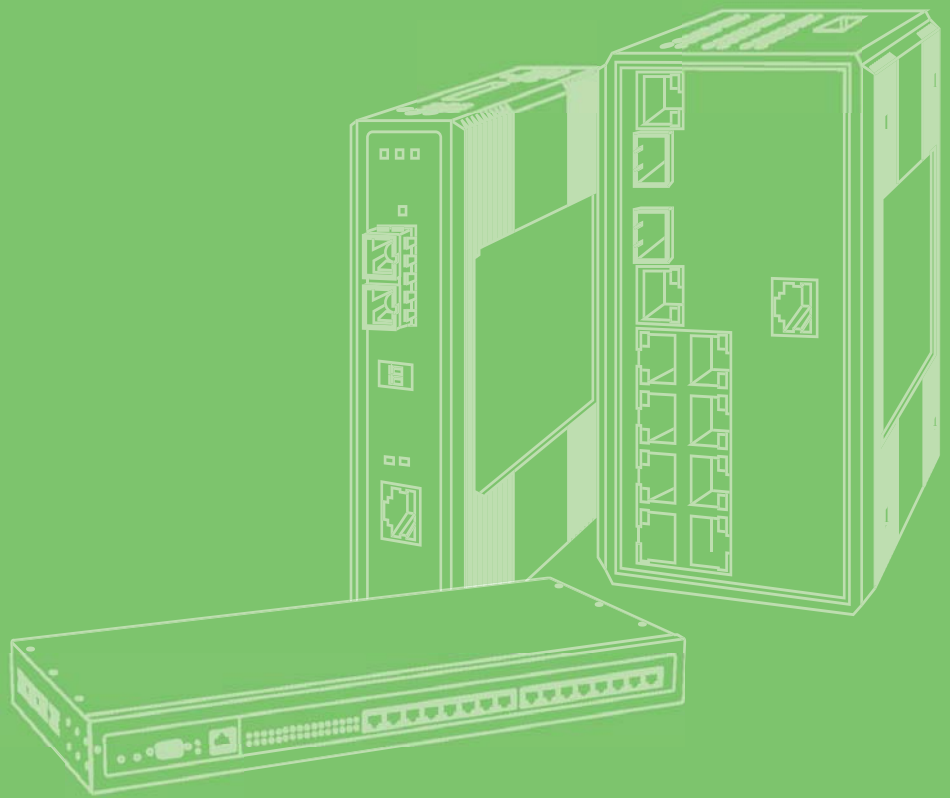


User Manual



## EKI-9508

EN 50155 8-port Managed PoE  
M12 Ethernet Switches

**ADVANTECH**

*Enabling an Intelligent Planet*

---

## Copyright

The documentation and the software included with this product are copyrighted 2018 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties, which may result from its use.

## Acknowledgements

Intel and Pentium are trademarks of Intel Corporation.

Microsoft Windows and MS-DOS are registered trademarks of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

## Product Warranty (5 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for five years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Part No. XXXXXXXXXXXX

Printed in Taiwan

Edition 1

March 2018

# Declaration of Conformity

## CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

## FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

# Technical Support and Assistance

1. Visit the Advantech web site at [www.advantech.com/support](http://www.advantech.com/support) where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
  - Product name and serial number
  - Description of your peripheral attachments
  - Description of your software (operating system, version, application software, etc.)
  - A complete description of the problem
  - The exact wording of any error messages

---

## Warnings, Cautions and Notes

**Warning!** Warnings indicate conditions, which if not observed, can cause personal injury!



**Caution!** Cautions are included to help you avoid damaging hardware or losing data. e.g.



*There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

**Note!** Notes provide optional additional information.



## Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: [support@advantech.com](mailto:support@advantech.com)

## Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- 1 x EN 50155 8-port Managed PoE M12 Ethernet Switches

# Safety Instructions

- Read these safety instructions carefully.
- Keep this User Manual for later reference.
- Disconnect this equipment from any DC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
- Keep this equipment away from humidity.
- Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
- The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Position the power cord so that people cannot step on it. Do not place anything over the power cord.
- All cautions and warnings on the equipment should be noted.
- If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
- Never pour any liquid into an opening. This may cause fire or electrical shock.
- Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
- If one of the following situations arises, get the equipment checked by service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment does not work well, or you cannot get it to work according to the user's manual.
  - The equipment has been dropped and damaged.
  - The equipment has obvious signs of breakage.
- **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO -40°C (-40°F) ~ 85°C (185°F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
- The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

---

## Wichtige Sicherheitshinweise

- Bitte lesen sie Sich diese Hinweise sorgfältig durch.
- Heben Sie diese Anleitung für den späteren Gebrauch auf.
- Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
- Die Netzanschlussteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.
- Das Gerät ist vor Feuchtigkeit zu schützen.
- Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.
- Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
- Beachten Sie beim. Anschluß an das Stromnetz die Anschlußwerte.
- Verlegen Sie die Netzanschlusbleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
- Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.
- Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
- Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.
- Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden.
- Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
  - Netzkabel oder Netzstecker sind beschädigt.
  - Flüssigkeit ist in das Gerät eingedrungen.
  - Das Gerät war Feuchtigkeit ausgesetzt.
  - Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
  - Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
  - Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
- Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weiger.

Haftungsausschluss: Die Bedienungsanleitungen wurden entsprechend der IEC-704-1 erstellt. Advantech lehnt jegliche Verantwortung für die Richtigkeit der in diesem Zusammenhang getätigten Aussagen ab.

## Safety Precaution - Static Electricity

Static electricity can cause bodily harm or damage electronic devices. To avoid damage, keep static-sensitive devices in the static-protective packaging until the installation period. The following guidelines are also recommended:

- Wear a grounded wrist or ankle strap and use gloves to prevent direct contact to the device before servicing the device. Avoid nylon gloves or work clothes, which tend to build up a charge.
- Always disconnect the power from the device before servicing it.
- Before plugging a cable into any port, discharge the voltage stored on the cable by touching the electrical contacts to the ground surface.

# Contents

|                  |  |           |
|------------------|--|-----------|
| <b>Chapter 1</b> | <b>Product Overview .....</b>                      | <b>1</b>  |
| 1.1              | Specifications.....                                | 2         |
| 1.2              | Hardware Views.....                                | 3         |
| 1.2.1            | Front View.....                                    | 3         |
| 1.3              | Dimensions .....                                   | 5         |
| <b>Chapter 2</b> | <b>Switch Installation .....</b>                   | <b>6</b>  |
| 2.1              | Installation Guidelines.....                       | 7         |
| 2.1.1            | Connecting Hardware .....                          | 7         |
| 2.2              | Verifying Switch Operation.....                    | 7         |
| 2.3              | Installing the Switch .....                        | 8         |
| 2.3.1            | Wall-Mounting.....                                 | 8         |
| 2.4              | Power Supply Installation.....                     | 9         |
| 2.4.1            | Overview.....                                      | 9         |
| 2.4.2            | Considerations.....                                | 10        |
| 2.4.3            | Grounding the Device .....                         | 10        |
| 2.4.4            | Wiring the Power Inputs.....                       | 11        |
| 2.5              | Connecting the Ethernet Media .....                | 13        |
| 2.5.1            | Connecting the 10/100/1000BaseT(X) .....           | 13        |
| 2.6              | Connecting the Console Terminal.....               | 13        |
| 2.6.1            | M12 A-Coded Connector Pin Assignment.....          | 13        |
| <b>Chapter 3</b> | <b>Configuration Utility .....</b>                 | <b>14</b> |
| 3.1              | First Time Setup.....                              | 15        |
| 3.1.1            | Overview.....                                      | 15        |
| 3.1.2            | Introduction .....                                 | 15        |
| 3.1.3            | Administrative Interface Access.....               | 15        |
| 3.1.4            | Using the Graphical (Web) Interface .....          | 16        |
| 3.1.5            | Configuring the Switch for Network Access.....     | 16        |
| 3.1.6            | Configuring the Ethernet Ports .....               | 17        |
| 3.2              | Command Line Interface Configuration .....         | 18        |
| 3.2.1            | Introduction to Command-Line Interface (CLI) ..... | 18        |
| 3.2.2            | Accessing the CLI.....                             | 18        |
| 3.3              | Web Browser Configuration .....                    | 19        |
| 3.3.1            | Preparing for Web Configuration .....              | 19        |
| 3.3.2            | System Login .....                                 | 19        |
| <b>Chapter 4</b> | <b>Managing Switch.....</b>                        | <b>20</b> |
| 4.1              | Log In.....  | 21        |
| 4.2              | Recommended Practices.....                         | 21        |
| 4.2.1            | Changing Default Password .....                    | 21        |
| 4.3              | Monitoring .....                                   | 22        |
| 4.3.1            | Device Information.....                            | 22        |
| 4.3.2            | Logging Message .....                              | 23        |
| 4.3.3            | Port Monitoring .....                              | 24        |
| 4.3.4            | Link Aggregation.....                              | 25        |
| 4.3.5            | LLDP Statistics .....                              | 26        |
| 4.3.6            | IGMP Statistics .....                              | 27        |
| 4.3.7            | MLD Statistics.....                                | 28        |



|      |                                     |     |
|------|-------------------------------------|-----|
| 4.4  | System .....                        | 29  |
|      | 4.4.1 IP Settings.....              | 29  |
|      | 4.4.2 IPv6 Settings.....            | 30  |
|      | 4.4.3 DHCP Client Option 82.....    | 31  |
|      | 4.4.4 DHCP Auto Provision.....      | 32  |
|      | 4.4.5 Management VLAN.....          | 32  |
|      | 4.4.6 System Time.....              | 33  |
|      | 4.4.7 Network Port.....             | 34  |
| 4.5  | L2 Switching.....                   | 35  |
|      | 4.5.1 Port Configuration.....       | 35  |
|      | 4.5.2 Port Mirror.....              | 36  |
|      | 4.5.3 Link Aggregation.....         | 37  |
|      | 4.5.4 802.1Q VLAN.....              | 40  |
|      | 4.5.5 Q-in-Q.....                   | 43  |
|      | 4.5.6 GARP.....                     | 44  |
|      | 4.5.7 802.3az EEE.....              | 47  |
|      | 4.5.8 Multicast.....                | 47  |
|      | 4.5.9 Jumbo Frame.....              | 52  |
|      | 4.5.10 Spanning Tree.....           | 53  |
|      | 4.5.11 X-Ring Elite.....            | 58  |
|      | 4.5.12 X-Ring Pro.....              | 59  |
|      | 4.5.13 Loopback Detection.....      | 61  |
| 4.6  | MAC Address Table.....              | 62  |
|      | 4.6.1 Static MAC.....               | 62  |
|      | 4.6.2 MAC Aging Time.....           | 63  |
|      | 4.6.3 Dynamic Forwarding Table..... | 63  |
| 4.7  | Security.....                       | 64  |
|      | 4.7.1 Storm Control.....            | 64  |
|      | 4.7.2 Port Security.....            | 66  |
|      | 4.7.3 Protected Ports.....          | 66  |
|      | 4.7.4 DoS Prevention.....           | 67  |
|      | 4.7.5 Applications.....             | 69  |
|      | 4.7.6 802.1x.....                   | 71  |
|      | 4.7.7 IP Security.....              | 72  |
| 4.8  | QoS.....                            | 73  |
|      | 4.8.1 General.....                  | 73  |
|      | 4.8.2 QoS Basic Mode.....           | 79  |
|      | 4.8.3 Rate Limit.....               | 80  |
| 4.9  | Management.....                     | 82  |
|      | 4.9.1 LLDP.....                     | 82  |
|      | 4.9.2 SNMP.....                     | 85  |
|      | 4.9.3 Power of Ethernet.....        | 87  |
|      | 4.9.4 Modbus TCP Settings.....      | 89  |
|      | 4.9.5 DHCP Server.....              | 89  |
|      | 4.9.6 SMTP Client.....              | 94  |
|      | 4.9.7 RMON.....                     | 96  |
| 4.10 | Diagnostics.....                    | 100 |
|      | 4.10.1 Cable Diagnostics.....       | 100 |
|      | 4.10.2 Ping Test.....               | 100 |
|      | 4.10.3 IPv6 Ping Test.....          | 102 |
|      | 4.10.4 System Log.....              | 103 |
|      | 4.10.5 LED Indication.....          | 105 |
| 4.11 | Tools.....                          | 106 |
|      | 4.11.1 IXM.....                     | 106 |
|      | 4.11.2 Backup Manager.....          | 107 |
|      | 4.11.3 Upgrade Manager.....         | 108 |
|      | 4.11.4 Dual Image.....              | 108 |
|      | 4.11.5 Save Configuration.....      | 109 |
|      | 4.11.6 User Account.....            | 109 |
|      | 4.11.7 Reset System.....            | 110 |

---

|      |                                       |     |
|------|---------------------------------------|-----|
|      | 4.11.8 Reboot Device .....            | 110 |
| 4.12 | Modbus/TCP Mapping .....              | 110 |
|      | 4.12.1 Modbus/TCP Mapping Table ..... | 110 |

# List of Figures

|             |   |    |
|-------------|---|----|
| Figure 1.1  | Front View .....  | 3  |
| Figure 1.2  | System LED Panel .....  | 4  |
| Figure 1.3  | Dimensions .....  | 5  |
| Figure 2.1  | Securing Wall Mounting Screws .....                                 | 8  |
| Figure 2.2  | Switch Installation .....   | 8  |
| Figure 2.3  | Power Wiring for EKI-9508 .....                                     | 9  |
| Figure 2.4  | Grounding Connection, Chassis Left Side View .....                  | 11 |
| Figure 2.5  | Installing the Power Cable .....                                    | 12 |
| Figure 2.6  | Standard M12 4-Pin Male DC Power Input Connector .....              | 12 |
| Figure 2.7  | M12 D-Coded Connector Pin Assignment .....                          | 13 |
| Figure 2.8  | M12 A-Coded Connector Pin Assignment .....                          | 13 |
| Figure 4.1  | Login Screen .....  | 21 |
| Figure 4.2  | Changing a Default Password .....                                   | 22 |
| Figure 4.3  | Monitoring > Device Information .....                               | 22 |
| Figure 4.4  | Monitoring > Logging Message .....                                  | 23 |
| Figure 4.5  | Monitoring > Port Monitoring > Port Statistics .....                | 24 |
| Figure 4.6  | Monitoring > Port Monitoring > Port Utilization .....               | 25 |
| Figure 4.7  | Monitoring > LLDP Statistics .....                                  | 26 |
| Figure 4.8  | Monitoring > IGMP Statistics .....                                  | 27 |
| Figure 4.9  | Monitoring > MLD Statistics .....                                   | 28 |
| Figure 4.10 | System > IP Settings .....  | 29 |
| Figure 4.11 | System > IPv6 Settings .....  | 30 |
| Figure 4.12 | System > DHCP Client Option 82 .....                                | 31 |
| Figure 4.13 | System > DHCP Auto Provision .....                                  | 32 |
| Figure 4.14 | System > Management VLAN .....                                      | 32 |
| Figure 4.15 | System > System Time .....  | 33 |
| Figure 4.16 | System > Network Port .....   | 34 |
| Figure 4.17 | L2 Switching > Port Configuration .....                             | 35 |
| Figure 4.18 | L2 Switching > Port Mirror .....                                    | 36 |
| Figure 4.19 | L2 Switching > Link Aggregation > Load Balance .....                | 37 |
| Figure 4.20 | L2 Switching > Link Aggregation > LAG Management .....              | 37 |
| Figure 4.21 | L2 Switching > Link Aggregation > LAG Port Settings .....           | 38 |
| Figure 4.22 | L2 Switching > Link Aggregation > LACP Priority Settings .....      | 38 |
| Figure 4.23 | L2 Switching > Link Aggregation > LACP Port Settings .....          | 39 |
| Figure 4.24 | L2 Switching > 802.1Q VLAN > VLAN Management .....                  | 40 |
| Figure 4.25 | L2 Switching > 802.1Q VLAN > PVID Settings .....                    | 40 |
| Figure 4.26 | L2 Switching > 802.1Q VLAN > Port to VLAN .....                     | 42 |
| Figure 4.27 | L2 Switching > Q-in-Q > Global Settings .....                       | 43 |
| Figure 4.28 | L2 Switching > Q-in-Q > Port Settings .....                         | 44 |
| Figure 4.29 | L2 Switching > GARP > GARP Settings .....                           | 45 |
| Figure 4.30 | L2 Switching > GARP > GVRP Settings .....                           | 45 |
| Figure 4.31 | L2 Switching > 802.3az EEE .....                                    | 47 |
| Figure 4.32 | L2 Switching > Multicast > Multicast Filtering .....                | 47 |
| Figure 4.33 | L2 Switching > Multicast > IGMP Snooping > IGMP Settings .....      | 48 |
| Figure 4.34 | L2 Switching > Multicast > IGMP Snooping > IGMP Querier .....       | 49 |
| Figure 4.35 | L2 Switching > Multicast > IGMP Snooping > IGMP Static Groups ..... | 49 |
| Figure 4.36 | L2 Switching > Multicast > MLD Snooping > MLD Settings .....        | 50 |
| Figure 4.37 | L2 Switching > Multicast > MLD Snooping > MLD Querier .....         | 51 |
| Figure 4.38 | L2 Switching > Multicast > MLD Snooping > MLD Static Group .....    | 51 |
| Figure 4.39 | L2 Switching > Jumbo Frame .....                                    | 52 |
| Figure 4.40 | L2 Switching > Spanning Tree > STP Global Settings .....            | 53 |
| Figure 4.41 | L2 Switching > Spanning Tree > STP Port Settings .....              | 54 |
| Figure 4.42 | L2 Switching > Spanning Tree > STP Bridge Settings .....            | 55 |
| Figure 4.43 | L2 Switching > Spanning Tree > STP Port Advanced Settings .....     | 56 |
| Figure 4.44 | L2 Switching > Spanning Tree > MST Config Identification .....      | 56 |
| Figure 4.45 | L2 Switching > Spanning Tree > MST Instance ID Settings .....       | 57 |

|              |  |    |
|--------------|--|----|
| Figure 4.46  | L2 Switching > Spanning Tree > MST Instance Priority Settings              | 57 |
| Figure 4.47  | L2 Switching > X-Ring Elite > X-Ring Elite Settings                        | 58 |
| Figure 4.48  | L2 Switching > X-Ring Elite > X-Ring Elite Groups                          | 58 |
| Figure 4.49  | L2 Switching > X-Ring Pro > X-Ring Pro Settings                            | 59 |
| Figure 4.50  | L2 Switching > X-Ring Pro > X-Ring Pro Groups > X-Ring Pro Groups Settings | 59 |
| Figure 4.51  | L2 Switching > X-Ring Pro > X-Ring Pro Groups > Chain Settings             | 60 |
| Figure 4.52  | L2 Switching > X-Ring Pro > X-Ring Pro Groups > Couple Setting             | 60 |
| Figure 4.53  | L2 Switching > X-Ring Pro > X-Ring Pro Groups > Pair Settings              | 60 |
| Figure 4.54  | L2 Switching > Loopback Detection > Global Settings                        | 61 |
| Figure 4.55  | L2 Switching > Loopback Detection > Port Settings                          | 62 |
| Figure 4.56  | MAC Address Table > Static MAC   | 62 |
| Figure 4.57  | MAC Address Table > MAC Aging Time   | 63 |
| Figure 4.58  | MAC Address Table > Dynamic Forwarding Table                               | 63 |
| Figure 4.59  | Security > Storm Control > Global Settings                                 | 64 |
| Figure 4.60  | Security > Storm Control > Port Settings                                   | 65 |
| Figure 4.61  | Security > Port Security   | 66 |
| Figure 4.62  | Security > Protected Ports   | 66 |
| Figure 4.63  | Security > DoS Prevention > DoS Global Settings                            | 67 |
| Figure 4.64  | Security > DoS Prevention > DoS Port Settings                              | 68 |
| Figure 4.65  | Security > Applications > TELNET   | 69 |
| Figure 4.66  | Security > Applications > SSH  | 69 |
| Figure 4.67  | Security > Applications > HTTP   | 70 |
| Figure 4.68  | Security > Applications > HTTPS  | 70 |
| Figure 4.69  | Security > 802.1x > 802.1x Global Settings                                 | 71 |
| Figure 4.70  | Security > 802.1x > 802.1x Port Configuration                              | 72 |
| Figure 4.71  | Security > IP Security > Global Settings                                   | 72 |
| Figure 4.72  | Security > IP Security > Entry Settings                                    | 73 |
| Figure 4.73  | QoS > General > QoS Properties   | 73 |
| Figure 4.74  | QoS > General > QoS Settings   | 74 |
| Figure 4.75  | QoS > General > QoS Scheduling   | 75 |
| Figure 4.76  | QoS > General > CoS Mapping  | 76 |
| Figure 4.77  | QoS > General > DSCP Mapping   | 77 |
| Figure 4.78  | QoS > General > IP Precedence Mapping                                      | 78 |
| Figure 4.79  | QoS > QoS Basic Mode > Global Settings                                     | 79 |
| Figure 4.80  | QoS > QoS Basic Mode > Port Settings                                       | 79 |
| Figure 4.81  | QoS > Rate Limit > Ingress Bandwidth Control                               | 80 |
| Figure 4.82  | QoS > Rate Limit > Egress Bandwidth Control                                | 80 |
| Figure 4.83  | QoS > Rate Limit > Egress Queue  | 81 |
| Figure 4.84  | Management > LLDP > LLDP System Settings                                   | 82 |
| Figure 4.85  | Management > LLDP > LLDP Port Settings > LLDP Port Configuration           | 83 |
| Figure 4.86  | Management > LLDP > LLDP Port Settings > Optional TLVs Selection           | 83 |
| Figure 4.87  | Management > LLDP > LLDP Port Settings > VLAN Name TLV VLAN Selection      | 84 |
| Figure 4.88  | Management > LLDP > LLDP Remote Device Info                                | 84 |
| Figure 4.89  | Management > SNMP > SNMP Settings  | 85 |
| Figure 4.90  | Management > SNMP > SNMP Community   | 85 |
| Figure 4.91  | Management > SNMP > SNMP User Settings                                     | 86 |
| Figure 4.92  | Management > SNMP > SNMP Trap  | 87 |
| Figure 4.93  | Management > Power of Ethernet > PoE System Settings                       | 87 |
| Figure 4.94  | Management > Power of Ethernet > PoE Port Settings                         | 88 |
| Figure 4.95  | Management > Modbus TCP Settings > Modbus TCP Settings                     | 89 |
| Figure 4.96  | Management > DHCP Server > Status Settings                                 | 89 |
| Figure 4.97  | Management > DHCP Server > Global Settings                                 | 90 |
| Figure 4.98  | Management > DHCP Server > Port Settings                                   | 91 |
| Figure 4.99  | <b>Management &gt; DHCP Server &gt; VLAN Settings</b>                      | 92 |
| Figure 4.100 | Management > DHCP Server > Option 82 Settings                              | 93 |
| Figure 4.101 | Management > SMTP Client > Global Settings                                 | 94 |
| Figure 4.102 | Management > SMTP Client > Profile Settings > Profile Settings             | 94 |
| Figure 4.103 | Management > SMTP Client > Profile Settings > Profile Target Mail Settings | 95 |
| Figure 4.104 | Management > SMTP Client > Sending Message                                 | 95 |
| Figure 4.105 | Management > RMON > Rmon Statistics  | 96 |

|              |  |     |
|--------------|--|-----|
| Figure 4.106 | Management > RMON > RMON History .....             | 97  |
| Figure 4.107 | Management > RMON > Rmon Alarm .....               | 98  |
| Figure 4.108 | Management > RMON > RMON Event .....               | 99  |
| Figure 4.109 | Diagnostics > Cable Diagnostics .....              | 100 |
| Figure 4.110 | Diagnostics > Ping Test.....                       | 101 |
| Figure 4.111 | Diagnostics > IPv6 Ping Test.....                  | 102 |
| Figure 4.112 | Diagnostics > System Log > Logging Service .....   | 103 |
| Figure 4.113 | Diagnostics > System Log > Local Logging .....     | 104 |
| Figure 4.114 | Diagnostics > System Log > System Log Server ..... | 104 |
| Figure 4.115 | Diagnostics > LED Indication.....                  | 105 |
| Figure 4.116 | Tools > IXM .....                                  | 106 |
| Figure 4.117 | Tools > Backup Manager.....                        | 107 |
| Figure 4.118 | Tools > Upgrade Manager.....                       | 108 |
| Figure 4.119 | Tools > Dual Image .....                           | 108 |
| Figure 4.120 | Tools > User Account .....                         | 109 |

# Chapter 1

Product Overview

# 1.1 Specifications

| Specifications    | Description               |  |   |
|-------------------|---------------------------|--|---|
| Interface         | I/O Port                  | 8 x 10/100Base-T M12 D-Coded   |   |
|                   | Console Port              | M12 A-Coded  |   |
|                   | Power Connector           | M12 A-Coded  |   |
| Physical          | Enclosure                 | Metal Shell  |   |
|                   | Protection Class          | IP40   |   |
|                   | Installation              | Wall mount   |   |
|                   | Dimensions (W x H x D)    | 122.5 x 179.4 x 71.8 mm (4.82" x 7.06" x 2.83")  |   |
| LED Display       | System LED                | SYS, PWR1, PWR2, R.M.  |   |
|                   | Port LED                  | DATA, PoE  |   |
| Environment       | Operating Temperature     | -40°C ~ 70°C (-40°F ~ 158°F)   |   |
|                   | Storage Temperature       | -40°C ~ 85°C (-40°F ~ 185°F)   |   |
|                   | Ambient Relative Humidity | 10 ~ 95% (non-condensing)  |   |
| Switch Properties | MAC Address               | 8K-entry   |   |
|                   | Jumbo Frame               | 9 KB   |   |
| Power             | Power Consumption         | ~ 5 W (System)   |   |
|                   | Power Input               | <ul style="list-style-type: none"> <li>■ EKI-9508E-MPH: 72/96/110 V<sub>DC</sub> dual input</li> <li>■ EKI-9508E-MPL: 24/48 V<sub>DC</sub> dual input</li> </ul> |   |
| Certifications    | EMI                       | <ul style="list-style-type: none"> <li>■ FCC Part 15 Subpart B Class A</li> <li>■ CE EN55022 (CISPR)</li> <li>■ EN55024 Class A</li> </ul>                       |   |
|                   |                           | EMS  | <ul style="list-style-type: none"> <li>■ EN61000-6-2</li> <li>■ EN61000-6-4</li> <li>■ EN61000-4-2 (ESD)</li> <li>■ EN61000-4-3 (RS)</li> <li>■ EN61000-4-4 (EFT)</li> <li>■ EN61000-4-5 (Surge)</li> <li>■ EN61000-4-6 (CS)</li> <li>■ EN61000-4-8 (Magnetic Field)</li> </ul> |
|                   |                           |  | Shock   |
|                   | Freefall                  |  | IEC 60068-2-32  |
|                   | Vibration                 |  | IEC 61373   |
|                   | Rail Traffic              |  | <ul style="list-style-type: none"> <li>■ EN50155</li> <li>■ EN50121-3-2</li> </ul>  |

## 1.2 Hardware Views

### 1.2.1 Front View

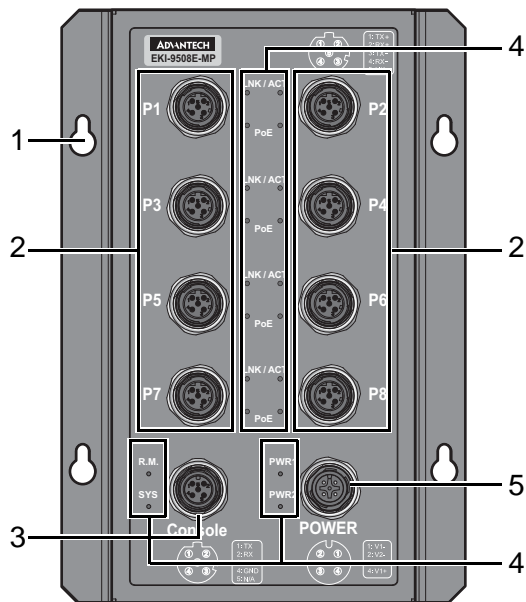


Figure 1.1 Front View

| No. | Item                | Description  |
|-----|---------------------|--|
| 1   | Wall mounting holes | Screw holes (x4) used in the installation on wall.               |
| 2   | ETH port            | 10/100Base-T M12 x 8 (D-coding)                                  |
| 3   | Console port        | M12 5-pin (female) port to access the managed switch's software. |
| 4   | System LED panel    | See "System LED Panel" on page 4 for further details.            |
| 5   | Power input port    | M12 5-pin (male) DC power connector port.                        |



### 1.2.1.1 System LED Panel

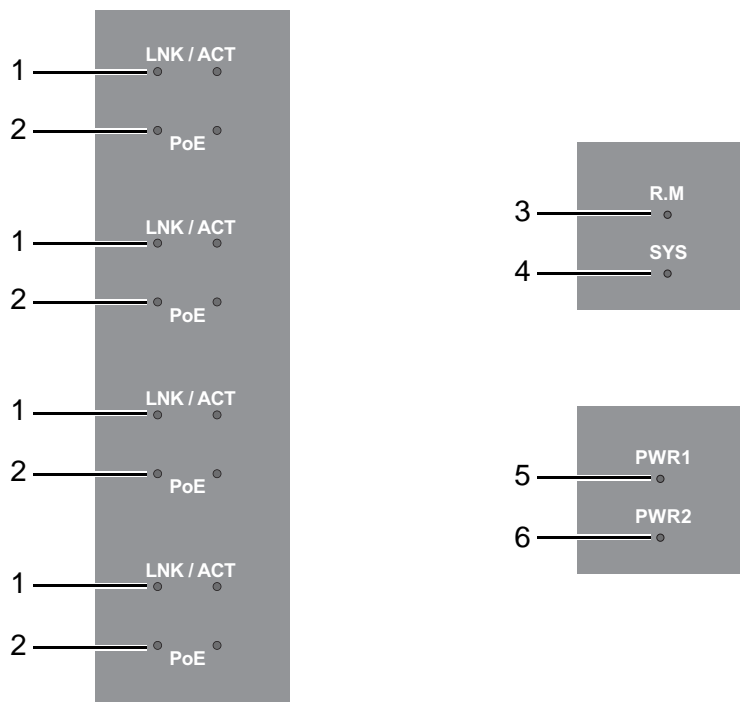
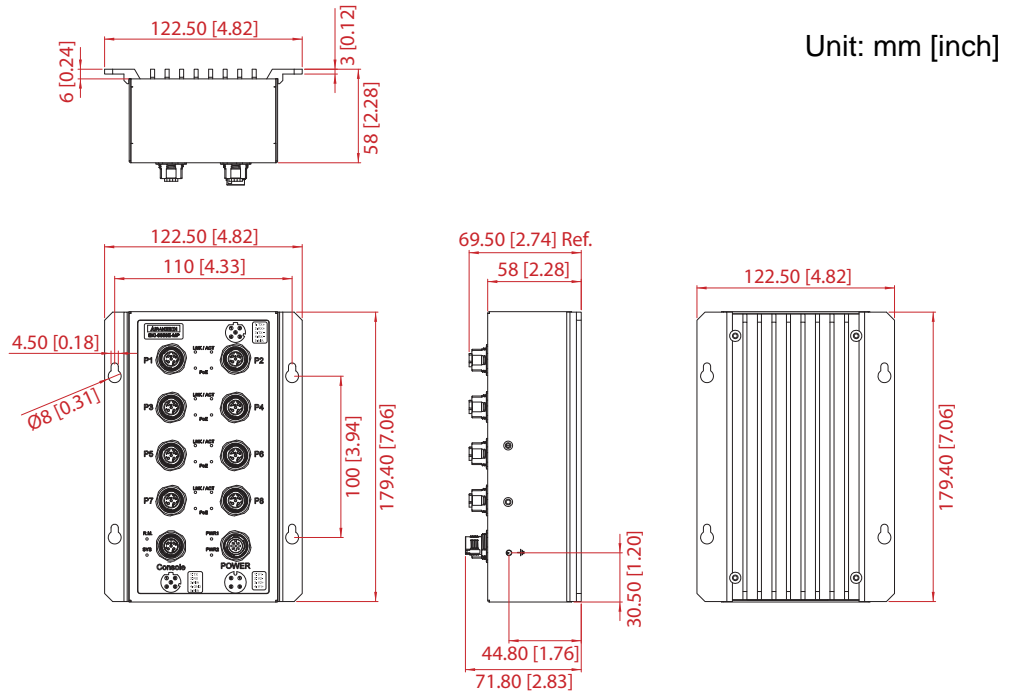


Figure 1.2 System LED Panel

| No. | LED Name | LED Color            | Description   |
|-----|----------|----------------------|---|
| 1   | LNK/ACT  | Solid green          | When there is a 1000Mbps connection (For Gigabit Ethernet Port).  |
|     |          | Blinking green       | When there is transmission or reception of data occurring at speed of 1000Mbps (For Gigabit Ethernet Port). |
|     |          | Solid amber          | When there is a 10/100Mbps connection.  |
|     |          | Blinking amber       | When there is transmission or reception of data occurring at speed of 10/100Mbps.                           |
|     |          | Off                  | No connection detected or system off.   |
| 2   | PoE      | Solid green          | Providing power over 15.4 W.  |
|     |          | Blinking green       | Providing power under 15.4 W.   |
|     |          | Off                  | User turns off PoE mode at corresponding Gigabit Ethernet port.   |
| 3   | R.M.     | Solid green          | Active when determining ring master   |
| 4   | SYS      | Solid green          | EKI switch system is ready.   |
|     |          | Blinking green (1Hz) | EKI switch system is under initiating.  |
|     |          | Blinking green (3Hz) | TBD   |
|     |          | Blinking green (5Hz) | TBD   |
|     |          | Off                  | Power on processing in U-Boot mode.   |
| 5   | PWR1     | Solid green          | Power is being supplied to power input PWR1.  |
|     |          | Off                  | Power is not being supplied to power input PWR1.  |
| 6   | PWR2     | Solid green          | Power is being supplied to power input PWR2.  |
|     |          | Off                  | Power is not being supplied to power input PWR2.  |

# 1.3 Dimensions



# Chapter 2

## Switch Installation

---

## 2.1 Installation Guidelines

The following guidelines are provided to optimize the device performance. Review the guidelines before installing the device.

- Make sure cabling is away from sources of electrical noise. Radios, power lines, and fluorescent lighting fixtures can interfere with the device performance.
- Make sure the cabling is positioned away from equipment that can damage the cables.
- Operating environment is within the ranges listed range, see “Specifications” on page 2.
- Relative humidity around the switch does not exceed 95 percent (noncondensing).
- Altitude at the installation site is not higher than 10,000 feet.
- In 10/100 and 10/100/1000 fixed port devices, the cable length from the switch to connected devices can not exceed 100 meters (328 feet).
- Make sure airflow around the switch and respective vents is unrestricted. Without proper airflow the switch can overheat. To prevent performance degradation and damage to the switch, make sure there is clearance at the top and bottom and around the exhaust vents.

### 2.1.1 Connecting Hardware

These instructions explain how to find a proper location for your Modbus Gateways, and how to connect to the network, hook up the power cable, and connect to the EKI-9508.

## 2.2 Verifying Switch Operation

Before installing the device in a rack or on a wall, power on the switch to verify that the switch passes the power-on self-test (POST). To connect the cabling to the power source see “Power Supply Installation” on page 9.

At startup (POST), the System LED blinks green, while the remaining LEDs are a solid green. Once the switch passes POST self-test, the System LED turns green. The other LEDs turn off and return to their operating status. If the switch fails POST, the System LED switches to an amber state.

After a successful self-test, power down the switch and disconnect the power cabling. The switch is now ready for installation at its final location.

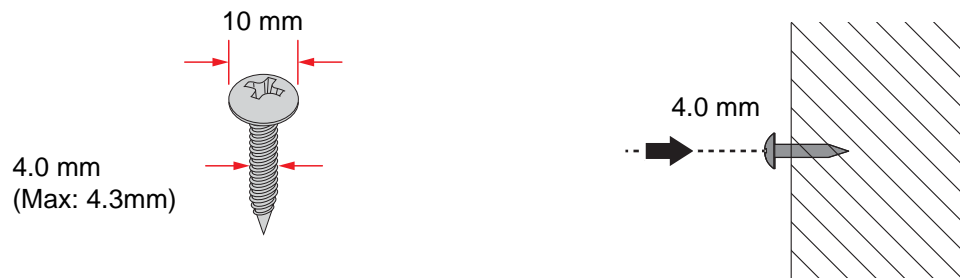
## 2.3 Installing the Switch

### 2.3.1 Wall-Mounting

**Note!** When installing, make sure to allow for enough space to properly install the cabling.



1. Locate the installation site and place the switch against the wall, making sure it is the final installation location.
2. Insert the screws into the wall sinks. Leave a 4 mm gap between the wall and the screw head to allow for wall mount plate insertion.



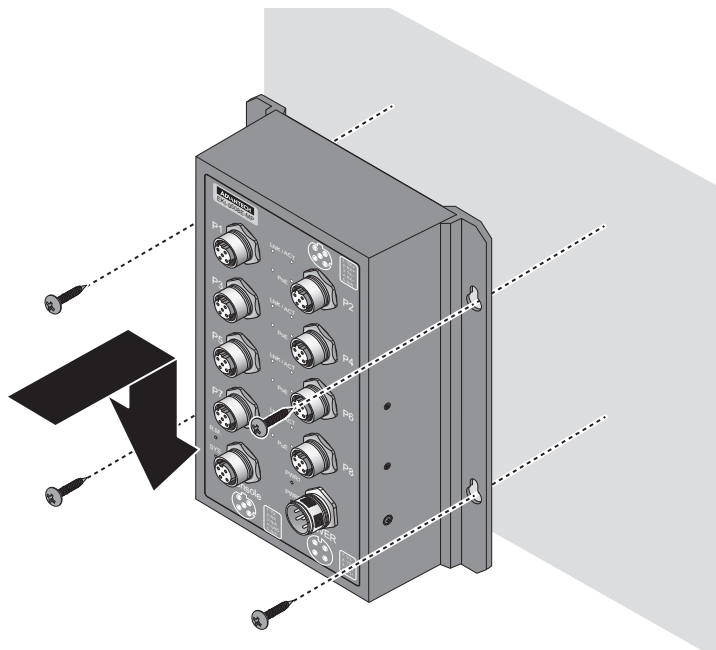
**Figure 2.1 Securing Wall Mounting Screws**

**Note!**

- Make sure the screws dimensions are suitable for use with the device.
- Do not completely tighten the screws into the wall. A final adjustment may be needed before fully securing the device on the wall.



3. Align the device over the screws on the wall.
4. Install the device on the screws and slide it downward to lock in place, see the following figure.



**Figure 2.2 Switch Installation**

5. Once the device is installed on the wall, tighten the screws to secure the device.

## 2.4 Power Supply Installation

### 2.4.1 Overview

**Warning!** Power down and disconnect the power cord before servicing or wiring the switch.



**Caution!** Do not disconnect modules or cabling unless the power is first switched off.



The device only supports the voltage outlined in the type plate. Do not use any other power components except those specifically designated for the switch device.

**Caution!** Disconnect the power cord before installation or cable wiring.



The switch can be powered by using the same DC source used to power other devices. A DC voltage range of 24 to 110 VDC must be applied between the V1+ terminal and the V1-terminal (PW1), see the following illustrations. The chassis ground screw terminal should be tied to the chassis ground. A redundant power configuration is supported through a secondary power supply unit to reduce network down time as a result of power loss.

EKI-9508 support 24 to 110 V<sub>DC</sub>. Dual power inputs are supported and allow you to connect a backup power source.

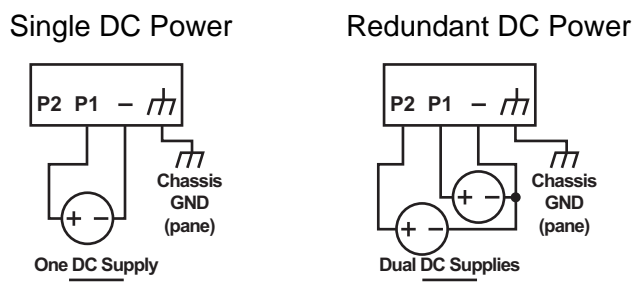


Figure 2.3 Power Wiring for EKI-9508

## 2.4.2 Considerations

Take into consideration the following guidelines before wiring the device:

- The Terminal Block (CN1) is suitable for 12-24 AWG (3.31 - 0.205 mm<sup>2</sup>). Torque value 7 lb-in.
- The cross sectional area of the earthing conductors shall be at least 3.31 mm<sup>2</sup>.
- Calculate the maximum possible current for each power and common wire. Make sure the power draw is within limits of local electrical code regulations.
- For best practices, route wiring for power and devices on separate paths.
- Do not bundle together wiring with similar electrical characteristics.
- Make sure to separate input and output wiring.
- Label all wiring and cabling to the various devices for more effective management and servicing.

**Note!** *Routing communications and power wiring through the same conduit may cause signal interference. To avoid interference and signal degradation, route power and communications wires through separate conduits.*



## 2.4.3 Grounding the Device

**Caution!** *Do not disconnect modules or cabling unless the power is first switched off.*



*The device only supports the voltage outlined in the type plate. Do not use any other power components except those specifically designated for the switch device.*

**Caution!** *Before connecting the device properly ground the device. Lack of a proper grounding setup may result in a safety risk and could be hazardous.*



**Caution!** *Do not service equipment or cables during periods of lightning activity.*



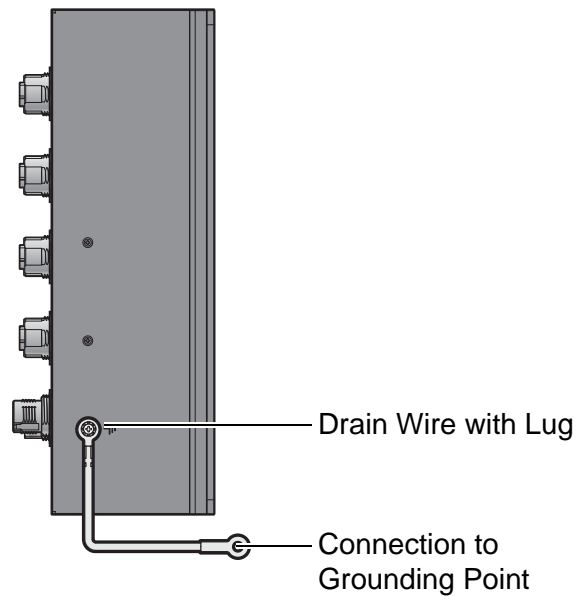
**Caution!** *Do not service any components unless qualified and authorized to do so.*



**Caution!** *Do not block air ventilation holes.*



Electromagnetic Interference (EMI) affects the transmission performance of a device. By properly grounding the device to earth ground through a drain wire, you can setup the best possible noise immunity and emissions.



**Figure 2.4 Grounding Connection, Chassis Left Side View**

By connecting the ground terminal by drain wire to earth ground the switch and chassis can be ground.

**Note!** Before applying power to the grounded switch, it is advisable to use a volt meter to ensure there is no voltage difference between the power supply's negative output terminal and the grounding point on the switch.



#### 2.4.4 Wiring the Power Inputs

**Caution!** Do not disconnect modules or cabling unless the power is first switched off.



The device only supports the voltage outlined in the type plate. Do not use any other power components except those specifically designated for the switch device.

**Warning!** Power down and disconnect the power cord before servicing or wiring the switch.

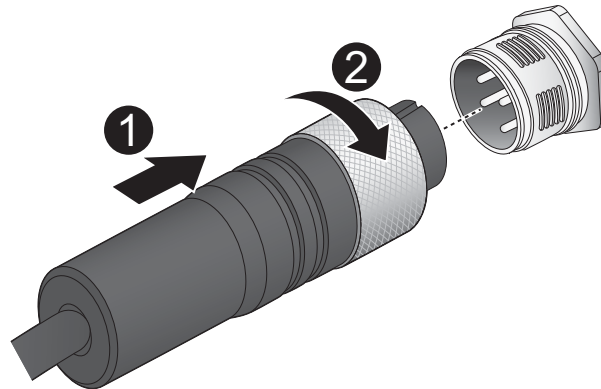




To wire the power inputs:

Make sure the power cable is not connected to the switch or the power converter before proceeding.

1. Align the notch on the cable with the protrusion on the connector port. Before inserting the cable, the cable must be aligned to the connector to prevent damage to the pins in the port.
2. Insert the cable and gently push it in. If there is any resistance, remove the cable and re-align it with the connector.
3. Once the cable is fully seated in the port, turn the nut on the cable to secure it to the connector.



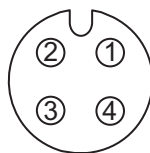
**Figure 2.5 Installing the Power Cable**

The power input is now connected to the switch. The switch can be powered on.

#### 2.4.4.1 Standard M12 4-Pin Male Pin Assignment

This section describes the proper connection of the 24, 48, 72, 96 and 110 V<sub>DC</sub> to the DC power connector on the switch. The DC input connector is located on the left side of the front panel. The power terminals are connected as shown in the following figure. They are electrically floating inside the unit so that either may be grounded by the user if desired. The chassis is earthed or ground (GND).

The mating connection to the switch is created through a RD24, female connector. Simply align the keyed female connector to the male connector and twist the threaded to secure.



**Figure 2.6 Standard M12 4-Pin Male DC Power Input Connector**

| Pin | Description |
|-----|-------------|
| 1   | V1-         |
| 2   | V2-         |
| 3   | V2+         |
| 4   | V1-         |

## 2.5 Connecting the Ethernet Media

### 2.5.1 Connecting the 10/100/1000BaseT(X)

The managed Ethernet models have Gigabit Ethernet ports (8-pin shielded M12 connector with X coding) or Fast Ethernet ports (5-pin shielded M12 connector with D coding) circular connectors. The 10/100/1000BaseT(X) ports located on the switch's front side are used to connect to Ethernet-enabled devices.

#### 2.5.1.1 M12 D-Coded Connector Pin Assignment

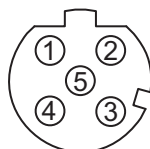


Figure 2.7 M12 D-Coded Connector Pin Assignment

| Pin | Description |
|-----|-------------|
| 1   | Tx+         |
| 2   | Rx+         |
| 3   | Tx-         |
| 4   | Rx-         |
| 5   | N/A         |

## 2.6 Connecting the Console Terminal

The console port, used to access the managed switch's software, has an 5-pin M12 (male) port. A console cable with the mating M12 (female) port and both a DB-9 and / or a USB connector is available for purchase from Advantech.

#### 2.6.1 M12 A-Coded Connector Pin Assignment

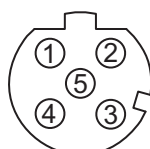


Figure 2.8 M12 A-Coded Connector Pin Assignment

| Pin | Description |
|-----|-------------|
| 1   | TX          |
| 2   | RX          |
| 3   | N/A         |
| 4   | GND         |
| 5   | N/A         |

# Chapter 3

## Configuration Utility

---

## 3.1 First Time Setup

### 3.1.1 Overview

The Industrial Ethernet Managed Switch is a configurable device that facilitates the interconnection of Ethernet devices on an Ethernet network. This includes computers, operator interfaces, I/O, controllers, RTUs, PLCs, other switches/hubs or any device that supports the standard IEEE 802.3 protocol.

This switch has all the capabilities of a store and forward Ethernet switch plus advanced management features such as SNMP, RSTP and port mirroring. This manual details how to configure the various management parameters in this easy to use switch.

### 3.1.2 Introduction

To take full advantage of all the features and resources available from the switch, it must be configured for your network.

The switch implements Rapid Spanning Tree Protocol (RSTP) and Simple Network Management Protocol (SNMP) to provide most of the services offered by the switch. Rapid Spanning Tree Protocol allows managed switches to communicate with each other to ensure that there exists only one active route between each pair of network nodes and provides automatic failover to the next available redundant route. A brief explanation of how RSTP works is given in the Spanning Tree section.

The switch is capable of communicating with other SNMP capable devices on the network to exchange management information. This statistical/derived information from the network is saved in the Management Information Base (MIB) of the switch. The MIB is divided into several different information storage groups. These groups will be elaborated in detail in the Management and SNMP information section of this document. The switch implements Internet Group Management Protocol (IGMP) to optimize the flow of multicast traffic on your network.

The switch supports both port-based and tag-based Virtual LANs for flexible integration with VLAN-aware networks with support for VLAN-unaware devices.

### 3.1.3 Administrative Interface Access

There are several administrative interfaces to the switch:

A graphical web interface accessible via the switch's built-in web server. Both HTTP and secure HTTPS with SSL are supported.

**Note!** *This is the recommended method for managing the switch.*



A terminal interface or over the network using telnet or Secure Shell (SSH) connected through the console (M12 A-Coded) port.

An SNMP interface can be used to read/write many settings.

Command Line Interface (CLI) can be used to read/write most settings. Initial setup must be done using an Ethernet connection (recommended) or the serial port.

### 3.1.4 Using the Graphical (Web) Interface

The graphical interface is provided via a web server in the switch and can be accessed via a web browser such as Opera, Mozilla, or Internet Explorer.

**Note!** *JavaScript must be supported and enabled in your browser for the graphical interface to work correctly.*



HTTP and HTTPS (secure HTTP) are supported for access to the web server. By default, both protocols are enabled. Either or both may be disabled to secure the switch. (See the Remote Access Security topic in this section.)

To access the graphical interface, enter the default IP setting (http://192.168.1.1) in your browser's address bar. Replace "http" with "https" to use secure http and replace "192.168.1.1" with your switch's IP address if you've changed it from the factory default.

The web server in the switch uses a signed security certificate. When you access the server via https, you may see a warning dialog indicating that the certificate was signed by an unknown authority. This is expected and to avoid this message in the future you can choose to install the certificate on your computer.

**Note!** *This manual describes and depicts the web user interface in detail. The terminal interface is not specifically shown.*



### 3.1.5 Configuring the Switch for Network Access

To control and monitor the switch via the network, it must be configured with basic network settings, including an IP address and subnet mask. Refer to the quick start guide in Section 1 for how to initially access your switch.

To configure the switch for network access, select [Add Menu Address Here] to reach the System Settings menu. The settings in this menu control the switch's general network configuration.

- DHCP Enabled/Disabled: The switch can automatically obtain an IP address from a server using the Dynamic Host Configuration Protocol (DHCP). This can speed up initial set up, as the network administrator does not have to find an open IP address.
- IP Address and subnet mask configuration: The IP address for the switch can be changed to a user-defined address along with a customized subnet mask to separate subnets.

**Note!** *Advanced users can set the IP address to 0.0.0.0 to disable the use of an IP address for additional security. However, any features requiring an IP address (i.e., web interface, etc.) will no longer be available.*



- Default Gateway Selection: A Gateway Address is chosen to be the address of a router that connects two different networks. This can be an IP address or a Fully Qualified Domain Name (FQDN) such as "domainname.org".
- NTP Server: The IP address or domain name of an NTP (Network Time Protocol) server from which the switch may retrieve the current time at startup.

---

Please note that using a domain name requires that at least one domain name server be configured.

### 3.1.6 Configuring the Ethernet Ports

The switch comes with default port settings that should allow you to connect to the Ethernet Ports with out any necessary configuration. Should there be a need to change the name of the ports, negotiation settings or flow control settings, you can do this in the Port Configuration menu. Access this menu by selecting Setup from the Main menu, and then selecting Main Settings.

- Port Name: Each port in the managed switch can be identified with a custom name. Specify a name for each port here.
- Admin: Ports can be enabled or disabled in the managed switch. For ports that are disabled, they are virtually non-existent (not visible in terms of switch operation or spanning tree algorithm). Choose to enable or disable a port by selecting Enabled or Disabled, respectively.
- Negotiation: All copper ports and gigabit fiber ports in the managed switch are capable of autonegotiation such that the fastest bandwidth is selected. Choose to enable auto-negotiation or use fixed settings. 100Mbps Fiber ports are Fixed speed only.
- Speed/Duplex/Flow Control: The managed switch accepts three local area network Ethernet Standards. The first standard, 10BASE-T, runs 10Mbps with twisted pair Ethernet cable between network interfaces. The second local area network standard is 100BASE-T, which runs at 100Mbps over the same twisted pair Ethernet cable. Lastly, there is 100BASE-F, which enables fast Ethernet (100Mbps) over fiber.

These options are available:

- 10h–10 Mbps, Half Duplex
- 10f –10 Mbps, Full Duplex
- 100h–100 Mbps, Half Duplex
- 100f –100 Mbps, Full Duplex
- 1000f–1000 Mbps, Full Duplex

On managed switches with gigabit combination ports, those ports with have two rows, a standard row of check boxes and a row labeled “SFP” with radio buttons. The SFP setting independently sets the speed at which a transceiver will operate if one is plugged in. Otherwise, the switch will use the fixed Ethernet port and the corresponding settings for it.

**Note!** *When 100f is selected for the SFP of a gigabit combination port, the corresponding fixed Ethernet jack will be disabled unless it is changed back to 1000F.*



## 3.2 Command Line Interface Configuration

### 3.2.1 Introduction to Command-Line Interface (CLI)

The command-line interface (CLI) is constructed with an eye toward automation of CLI-based configuration. The interaction is modeled on that used in many Internet protocols such as Telnet, FTP, and SMTP. After each command is entered and processed, the switch will issue a reply that consists of a numeric status code and a human-readable explanation of the status.

The general format of commands is:

```
section parameter [value]
```

where:

- section is used to group parameters.
- parameter will specify the parameter within the section. For example, the network section will have parameters for DHCP, IP address, subnet mask, and default gateway.
- value is the new value of the parameter. If value is omitted, the current value is displayed.

Please note that new values will not take effect until explicitly committed.

Sections and parameter names are case sensitive (e.g., “Network” is not the same as “network”).

**Note!** *Any commands in the CLI Commands section of this chapter, with the exception of the global commands, must be prefaced with the name of the section they are in. For example, to change the IP address of the switch, you would type:*



```
network address <newIP>
```

### 3.2.2 Accessing the CLI

To access the CLI interface, establish Ethernet or serial connectivity to the switch.

To connect by Ethernet, open a command prompt window and type:

```
telnet <switchip> (where <switchip> is the IP address of the switch)
```

At the login prompt, type “cli” for the username and “admin” for the password. The switch will respond with “Managed switch configuration CLI ready”.

---

## 3.3 Web Browser Configuration

The switch has an HTML based user interface embedded in the flash memory. The interface offers an easy to use means to manage basic and advanced switch functions. The interface allows for local or remote switch configuration anywhere on the network. The interface is designed for use with [Internet Explorer (6.0), Chrome, Firefox].

### 3.3.1 Preparing for Web Configuration

The interface requires the installation and connection of the switch to the existing network. A PC also connected to the network is required to connect to the switch and access the interface through a web browser. Use this networking information:

- IP address: 192.168.1.1
- Subnet mask: 255.255.255.0
- Default gateway: 192.168.1.254
- User name: admin
- Password: admin

### 3.3.2 System Login

Once the switch is installed and connected, power on the switch. The following information guides you through the logging in process.

1. Launch your web browser.
2. In the browser's address bar, type the switch's default IP address (192.168.1.1).

The login screen displays.

3. Enter the user default name and password (admin / admin).
4. Click **OK** on the login screen to log in.

The main interface displays.



# Chapter 4

## Managing Switch

## 4.1 Log In

To access the login window, connect the device to the network, see “Connecting the Ethernet Media” on page 13. Once the switch is installed and connected, power on the switch see the following procedures to log into your switch.

When the switch is first installed, the default network configuration is set to DHCP enabled. You will need to make sure your network environment supports the switch setup before connecting it to the network.

1. Launch your web browser on a computer.
2. In the browser’s address bar type in the switch’s default IP address (192.168.1.1). The login screen displays.
3. Enter the default user name and password (admin/admin) to log into the management interface. You can change the default password after you have successfully logged in.
4. Click **Login** to enter the management interface.

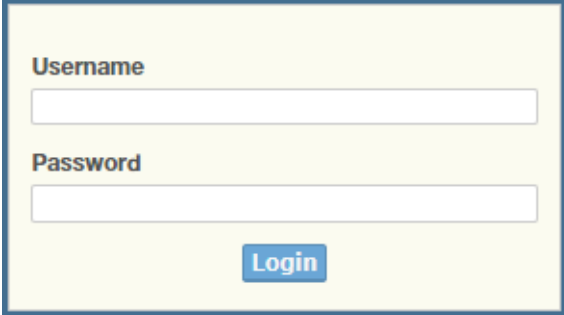
The image shows a web-based login interface. It features two text input fields: the top one is labeled "Username" and the bottom one is labeled "Password". Below these fields is a blue button with the text "Login" in white. The entire form is enclosed in a thin blue border.

Figure 4.1 Login Screen

## 4.2 Recommended Practices

One of the easiest things to do to help increase the security posture of the network infrastructure is to implement a policy and standard for secure management. This practice is an easy way to maintain a healthy and secure network.

After you have performed the basic configurations on your switches, the following is a recommendation which is considered best practice policy.

### 4.2.1 Changing Default Password

In keeping with good management and security practices, it is recommended that you change the default password as soon as the device is functioning and setup correctly. The following details the necessary steps to change the default password.

To change the password:

1. Navigate to **Tools > User Account**.
2. From the User drop-down menu, select the Admin (default) account.
3. In the **User Name** field, enter admin for this account. It is not necessary to change the user name, however, a change in the default settings increases the security settings.
4. In the **Password** field, type in the new password. Re-type the same password in the **Retype Password** field.

5. Click **Apply** to change the current account settings.

The screenshot shows a window titled "Add/Edit User" with a gear icon in the top-left corner. The window contains the following fields and controls:

- User Name:** A text input field containing "Input name".
- Password Type:** A dropdown menu currently set to "Clear Text".
- Password:** A text input field containing "Input password".
- Retype Password:** A text input field containing "Input password".
- Privilege Type:** A dropdown menu currently set to "Admin".
- Apply:** A blue button located below the other fields.

**Figure 4.2 Changing a Default Password**

After saving all the desired settings, perform a system save (**Tools > Save Configuration**). The changes are saved.

## 4.3 Monitoring

### 4.3.1 Device Information

The Device Information menu lists information, such as: System Name, System Location, MAC Address, Firmware version, and more, pertaining to the system. The information is for review only. To modify the device information, see the respective item within the user interface.

To access this page, click **Monitoring > Device Information**.

The screenshot shows a window titled "Device Information" with a table containing the following data:

| Information Name | Information Value                 |
|------------------|-----------------------------------|
| System Name      | <a href="#">Switch</a>            |
| System Location  | <a href="#">Default</a>           |
| System Contact   | <a href="#">Default</a>           |
| MAC Address      | 00:D0:C9:F5:31:0B                 |
| IP Address       | 192.168.1.156                     |
| Subnet Mask      | 255.255.255.0                     |
| Gateway          | 192.168.1.1                       |
| Loader Version   | 1.0.0.48895                       |
| Loader Date      | Sep 02 2015 - 13:26:50            |
| Firmware Version | 1.00.21                           |
| Firmware Date    | Sep 02 2015 - 13:27:32            |
| System Object ID | 1.3.6.1.4.1.10297.202.7000        |
| System Up Time   | 0 days, 4 hours, 31 mins, 13 secs |

**Figure 4.3 Monitoring > Device Information**

The following table describes the items in the previous figure.

| Item             | Description   |
|------------------|---|
| System Name      | Click <b>Switch</b> to enter the system name: up to 128 alphanumeric characters (default is Switch).      |
| System Location  | Click <b>Default</b> to enter the location: up to 256 alphanumeric characters (default is Default).       |
| System Contact   | Click <b>Default</b> to enter the contact person: up to 128 alphanumeric characters (default is Default). |
| MAC Address      | Displays the MAC address of the switch.   |
| IP Address       | Displays the assigned IP address of the switch.   |
| Subnet Mask      | Displays the assigned subnet mask of the switch.  |
| Gateway          | Displays the assigned gateway of the switch.  |
| Loader Version   | Displays the current loader version of the switch.  |
| Loader Date      | Displays the current loader build date of the switch.   |
| Firmware Version | Displays the current firmware version of the switch.  |
| Firmware Date    | Displays the current firmware build date of the switch.   |
| Build Version    | Displays the current build version of the switch.   |
| System Object ID | Displays the base object ID of the switch.  |
| System Up Time   | Displays the time since the last switch reboot.   |

### 4.3.2 Logging Message

The Logging Message Filter page allows you to enable the display of logging message filter.

To access this page, click **Monitoring > Logging Message**.

**Figure 4.4 Monitoring > Logging Message**

The following table describes the items in the previous figure.

| Item   | Description   |
|--------|---|
| Target | <p>Click the drop-down menu to select a target to store the log messages.</p> <ul style="list-style-type: none"> <li>■ Buffered: Store log messages in RAM. All log messages are cleared after system reboot.</li> <li>■ File: Store log messages in a file.</li> </ul> |

| Item                    | Description  |
|-------------------------|--|
| Severity                | The setting allows you to designate a severity level for the Logging Message Filter function.<br>Click the drop-down menu to select the severity level target setting. The level options are: <ul style="list-style-type: none"> <li>■ emerg: Indicates system is unusable. It is the highest level of severity.</li> <li>■ alert: Indicates action must be taken immediately.</li> <li>■ crit: Indicates critical conditions.</li> <li>■ error: Indicates error conditions.</li> <li>■ warning: Indicates warning conditions.</li> <li>■ notice: Indicates normal but significant conditions.</li> <li>■ info: Indicates informational messages.</li> <li>■ debug: Indicates debug-level messages.</li> </ul> |
| Category                | Click the drop-down menu to select the category level target setting.  |
| View                    | Click <b>View</b> to display all Logging Information and Logging Message information.  |
| Refresh                 | Click <b>Refresh</b> to update the screen.   |
| Clear buffered messages | Click <b>Clear buffered messages</b> to clear the logging buffer history list.   |

The ensuing table for **Logging Information** table settings are informational only: Target, Severity and Category.

The ensuing table for **Logging Message** table settings are informational only: No., Time Stamp, Category, Severity and Message.

### 4.3.3 Port Monitoring

Port Network Monitor is a bandwidth and network monitoring tool for the purpose of capturing network traffic and measuring of network throughput. The monitoring functionality includes listing of port statistics as well as port utilization.

#### 4.3.3.1 Port Statistics

To access this page, click **Monitoring > Port Monitoring > Port Statistics**.



**Figure 4.5 Monitoring > Port Monitoring > Port Statistics**

The following table describes the items in the previous figure.

| Item  | Description  |
|-------|--|
| Port  | Click the drop-down menu to select a port and its captured statistical setting values. |
| Clear | Click <b>Clear</b> to clear the counter selections.                                    |

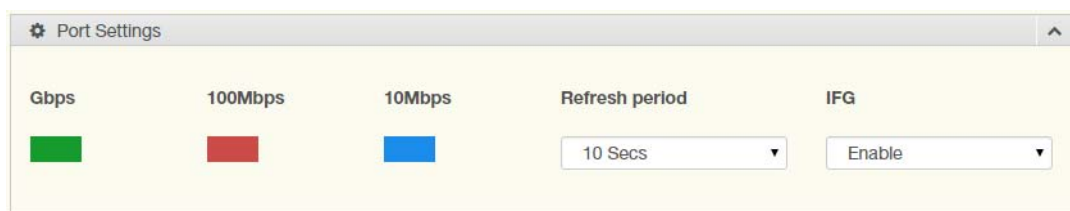
The ensuing table for **IF MIB Counters** settings are informational only: ifInOctets, ifInUcastPkts, ifInNUcastPkts, ifInDiscards, ifOutOctets, ifOutUcastPkts, ifOutNUcastPkts, ifOutDiscards, ifInMulticastPkts, ifInBroadcastPkts, ifOutMulticastPkts and ifOutBroadcastPkts.

The ensuing table for **Ether-Like MIB Counters** settings are informational only: dot3StatsAlignmentErrors, dot3StatsFCSErrors, dot3StatsSingleCollisionFrames, dot3StatsMultipleCollisionFrames, dot3StatsDeferredTransmissions, dot3StatsLateCollisions, dot3StatsExcessiveCollisions, dot3StatsFrameTooLongs, dot3StatsSymbolErrors, dot3ControlInUnknownOpCodes, dot3InPauseFrames and dot3OutPauseFrames.

The ensuing table for **Rmon MIB Counters** settings are informational only: etherStatsDropEvents, etherStatsOctets, etherStatsPkts, etherStatsBroadcastPkts, etherStatsMulticastPkts, etherStatsCRCAlignErrors, etherStatsUnderSizePkts, etherStatsOverSizePkts, etherStatsFragments, etherStatsJabbers, etherStatsCollisions, etherStatsPkts64Octets, etherStatsPkts65to127Octets, etherStatsPkts128to255Octets, etherStatsPkts256to511Octets, etherStatsPkts512to1023Octets and etherStatsPkts1024to1518Octets.

#### 4.3.3.2 Port Utilization

To access this page, click **Monitoring > Port Monitoring > Port Utilization**.



**Figure 4.6 Monitoring > Port Monitoring > Port Utilization**

The following table describes the items in the previous figure.

| Item           | Description   |
|----------------|---|
| Refresh period | Click the drop-down menu to select and designate a period (second intervals) to refresh the information (TX and RX) listings. |
| IFG            | Click the drop-down menu to enable or disable the Interframe Gap (IFG) statistic.   |

#### 4.3.4 Link Aggregation

The Link Aggregation function provides LAG information for each trunk. It displays membership status, link state and membership type for each port.

To access this page, click **Monitoring > Link Aggregation**.

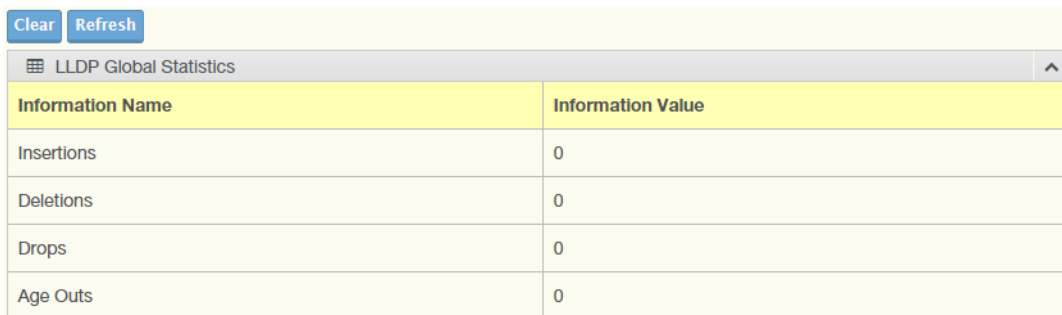
The ensuing table for **Link Aggregation Group Status** settings are informational only: LAG, Name, Type, Link State, Active Member and Standby Member.

The ensuing table for **LACP Information** settings are informational only: LAG, Port, PartnerSysId, PnKey, AtKey, Sel, Mux, Receiv, PrdTx, AtState and PnState.

### 4.3.5 LLDP Statistics

The LLDP Statistics page displays the LLDP statistics.

To access this page, click **Monitoring > LLDP Statistics**.



| Information Name | Information Value |
|------------------|-------------------|
| Insertions       | 0                 |
| Deletions        | 0                 |
| Drops            | 0                 |
| Age Outs         | 0                 |

**Figure 4.7 Monitoring > LLDP Statistics**

The following table describes the items in the previous figure.

| Item    | Description   |
|---------|---|
| Clear   | Click <b>Clear</b> to reset LLDP Statistics of all the interfaces.                                      |
| Refresh | Click <b>Refresh</b> to update the data on the screen with the present state of the data in the switch. |

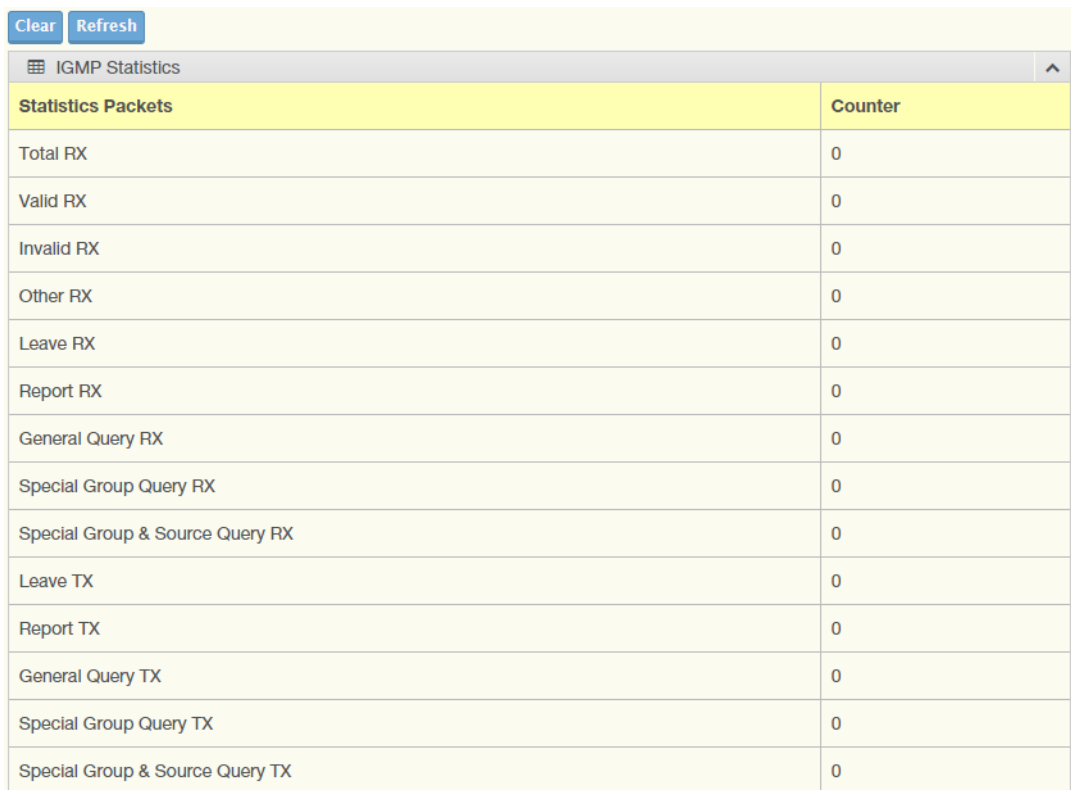
The ensuing table for **LLDP Global Statistics** settings are informational only: Insertions, Deletions, Drops and Age Outs.

The ensuing table for **LLDP Port Statistics** settings are informational only: Port, TX Frames (Total), RX Frames (Total, Discarded and Errors), RX TLVs (Discarded and Unrecognized) and RX Ageouts (Total).

### 4.3.6 IGMP Statistics

The IGMP Statistics function displays statistical package information for IP multicasting.

To access this page, click **Monitoring > IGMP Statistics**.



| IGMP Statistics                 |         |
|---------------------------------|---------|
| Statistics Packets              | Counter |
| Total RX                        | 0       |
| Valid RX                        | 0       |
| Invalid RX                      | 0       |
| Other RX                        | 0       |
| Leave RX                        | 0       |
| Report RX                       | 0       |
| General Query RX                | 0       |
| Special Group Query RX          | 0       |
| Special Group & Source Query RX | 0       |
| Leave TX                        | 0       |
| Report TX                       | 0       |
| General Query TX                | 0       |
| Special Group Query TX          | 0       |
| Special Group & Source Query TX | 0       |

**Figure 4.8 Monitoring > IGMP Statistics**

The following table describes the items in the previous figure.

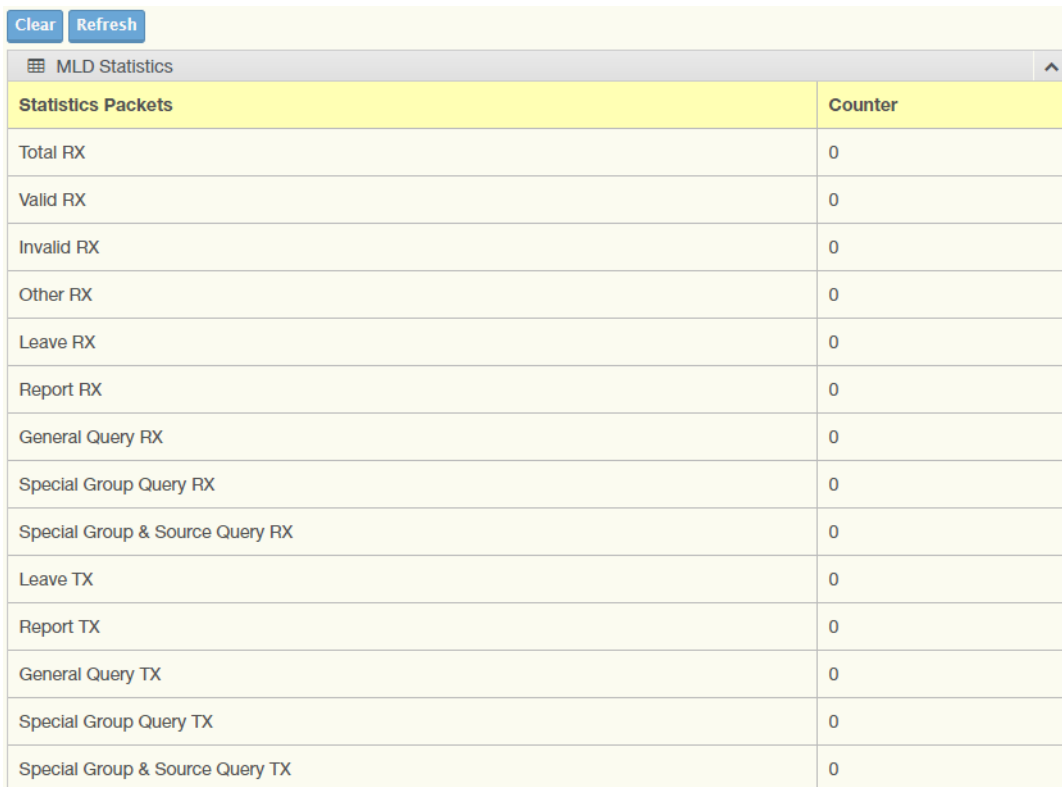
| Item    | Description   |
|---------|---|
| Clear   | Click <b>Clear</b> to refresh IGMP Statistics of all the interfaces.                                    |
| Refresh | Click <b>Refresh</b> to update the data on the screen with the present state of the data in the switch. |

The ensuing table for **IGMP Statistics** settings are informational only: Total RX, Valid RX, Invalid RX, Other RX, Leave RX, Report RX, General Query RX, Special Group Query RX, Special Group & Source Query RX, Leave TX, Report TX, General Query TX, Special Group Query TX and Special Group & Source Query TX.



### 4.3.7 MLD Statistics

The MLD Statistics page displays the Multicast Listener Discovery (MLD) statistics. To access this page, click **Monitoring > MLD Statistics**.



| MLD Statistics                  |         |
|---------------------------------|---------|
| Statistics Packets              | Counter |
| Total RX                        | 0       |
| Valid RX                        | 0       |
| Invalid RX                      | 0       |
| Other RX                        | 0       |
| Leave RX                        | 0       |
| Report RX                       | 0       |
| General Query RX                | 0       |
| Special Group Query RX          | 0       |
| Special Group & Source Query RX | 0       |
| Leave TX                        | 0       |
| Report TX                       | 0       |
| General Query TX                | 0       |
| Special Group Query TX          | 0       |
| Special Group & Source Query TX | 0       |

**Figure 4.9 Monitoring > MLD Statistics**

The following table describes the items in the previous figure.

| Item    | Description   |
|---------|---|
| Clear   | Click <b>Clear</b> to refresh IGMP Statistics of all the interfaces.                                    |
| Refresh | Click <b>Refresh</b> to update the data on the screen with the present state of the data in the switch. |

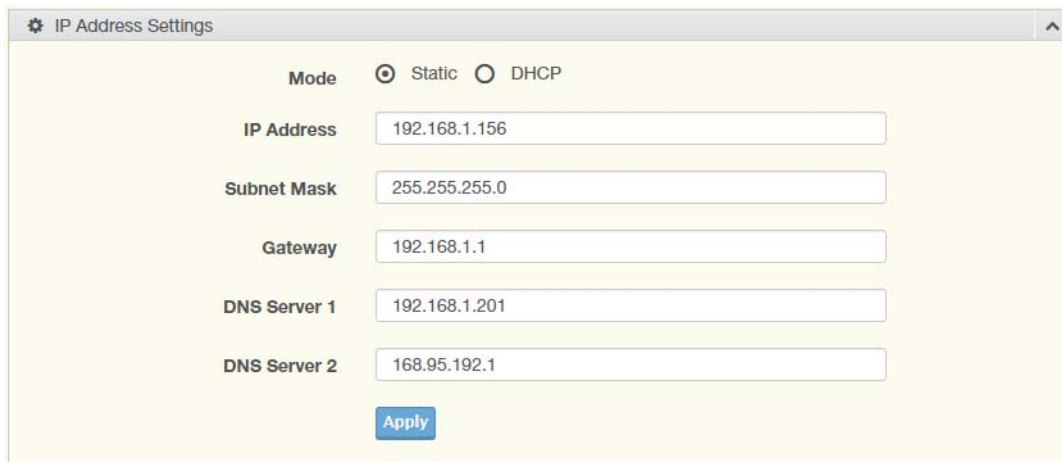
The ensuing table for **MLD Statistics** settings are informational only: Total RX, Valid RX, Invalid RX, Other RX, Leave RX, Report RX, General Query RX, Special Group Query RX, Special Group & Source Query RX, Leave TX, Report TX, General Query TX, Special Group Query TX and Special Group & Source Query TX.

## 4.4 System

### 4.4.1 IP Settings

The IP Settings menu allows you to select a static or DHCP network configuration. The Static displays the configurable settings for the static option.

To access this page, click **System > IP Settings**.



**Figure 4.10 System > IP Settings**

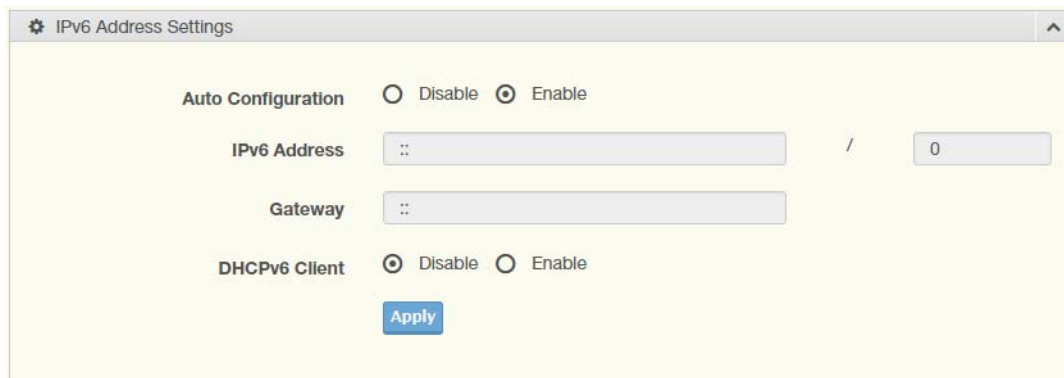
The following table describes the items in the previous figure.

| Item         | Description   |
|--------------|---|
| Mode         | Click the radio button to select the IP Address Setting mode: Static or DHCP.                 |
| IP Address   | Enter a value to specify the IP address of the interface. The default is 192.168.1.1.         |
| Subnet Mask  | Enter a value to specify the IP subnet mask for the interface. The default is 255.255.255.0.  |
| Gateway      | Enter a value to specify the default gateway for the interface. The default is 192.168.1.254. |
| DNS Server 1 | Enter a value to specify the DNS server 1 for the interface. The default is 168.95.1.1.       |
| DNS Server 2 | Enter a value to specify the DNS server 2 for the interface. The default is 168.95.192.1.     |
| Apply        | Click <b>Apply</b> to save the values and update the screen.                                  |

The ensuing table for **IP Address Information** settings are informational only: DHCP State, Static IP Address, Static Subnet Mask, Static Gateway, Static DNS Server 1 and Static DNS Server 2.

## 4.4.2 IPv6 Settings

To access this page, click **System > IPv6 Settings**.



**Figure 4.11 System > IPv6 Settings**

The following table describes the items in the previous figure.

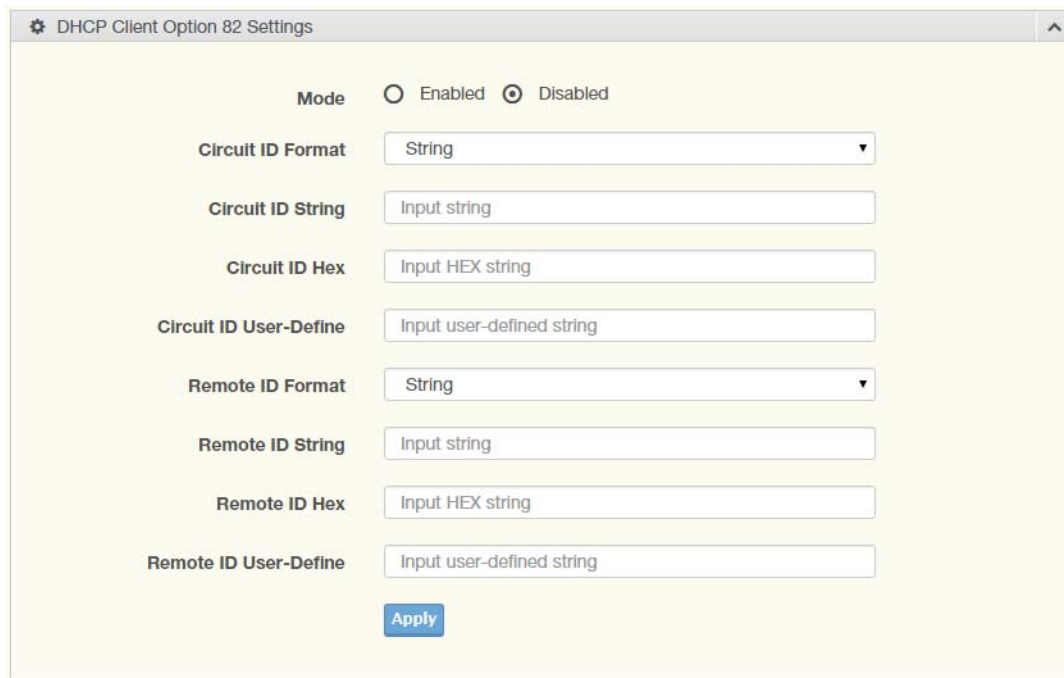
| Item               | Description  |
|--------------------|--|
| Auto Configuration | Select the radio button to enable or disable the IPv6.       |
| IPv6 Address       | Enter the IPv6 address for the system.                       |
| Gateway            | Enter the gateway address for the system.                    |
| DHCPv6 Client      | Enter the DHCPv6 address for the system.                     |
| Apply              | Click <b>Apply</b> to save the values and update the screen. |

The ensuing table for **IPv6 Information** settings are informational only: Auto Configuration, IPv6 In Use Address, IPv6 In Use Router, IPv6 Static Address, IPv6 Static Router and DHCPv6 Client.

### 4.4.3 DHCP Client Option 82

The DHCP Client Option 82 configurable Circuit ID and Remote ID feature enhances validation security by allowing you to select naming choices suboptions. You can select a switch-configured hostname or specify an ASCII test string for the remote ID. You can also configure an ASCII text string to override the circuit ID.

To access this page, click **System > DHCP Client Option 82**.



**Figure 4.12 System > DHCP Client Option 82**

The following table describes the items in the previous figure.

| Item                   | Description   |
|------------------------|---|
| Mode                   | Click the radio button to enable or disable the DHCP Client Option 82 mode.         |
| Circuit ID Format      | Click the drop-down menu to set the ID format: String, Hex, User Definition.        |
| Circuit ID String      | Enter the string ID of the corresponding class.                                     |
| Circuit ID Hex         | Enter the hex string of the corresponding class.                                    |
| Circuit ID User-Define | Enter the user definition of the corresponding class.                               |
| Remote ID Format       | Click the drop-down menu to set the Remote ID format: String, Hex, User Definition. |
| Remote ID String       | Enter the remote string ID of the corresponding class.                              |
| Remote ID Hex          | Enter the remote hex string of the corresponding class.                             |
| Remote ID User-Define  | Enter the remote user definition of the corresponding class.                        |
| Apply                  | Click <b>Apply</b> to save the values and update the screen.                        |

The ensuing table for **DHCP Client Option 82 Information** table settings are informational only: Status, Circuit ID Format, Circuit ID String, Circuit ID Hex, Circuit ID User-Define, Remote ID Format, Remote ID String, Remote ID Hex and Remote ID User-Define.

#### 4.4.4 DHCP Auto Provision

The DHCP Auto Provision feature allows you to load configurations using a server with DHCP options. Through the remote connection, the switch obtains information from a configuration file available through the TFTP server.

To access this page, click **System > DHCP Auto Provision**.



**Figure 4.13 System > DHCP Auto Provision**

The following table describes the items in the previous figure.

| Item   | Description  |
|--------|--|
| Status | Select the radio button to enable or disable the DHCP Auto Provisioning Setting. |
| Apply  | Click <b>Apply</b> to save the values and update the screen.                     |

The ensuing table for **DHCP Auto Provision Information** settings are informational only: Status.

#### 4.4.5 Management VLAN

By default the VLAN is the management VLAN providing communication with the switch management interface.

To access this page, click **System > Management VLAN**.



**Figure 4.14 System > Management VLAN**

The following table describes the items in the previous figure.

| Item            | Description  |
|-----------------|--|
| Management VLAN | Click the drop-down menu to select a defined VLAN.           |
| Apply           | Click <b>Apply</b> to save the values and update the screen. |

The ensuing table for **Management VLAN State** are informational only: Management VLAN.

## 4.4.6 System Time

To access this page, click **System > System Time**.

**Figure 4.15 System > System Time**

The following table describes the items in the previous figure.

| Item                        | Description  |
|-----------------------------|--|
| Enable SNTP                 | Click the radio button to enable or disable the SNTP.  |
| SNTP/NTP Server Address     | Enter the address of the SNTP server. This is a text string of up to 64 characters containing the encoded unicast IP address or hostname of a SNTP server. Unicast SNTP requests will be sent to this address. If this address is a DNS hostname, then that hostname should be resolved into an IP address each time a SNTP request is sent to it. |
| SNTP Port                   | Enter the port on the server to which SNTP requests are to be sent. Allowed range is 1 to 65535 (default: 123).  |
| Manual Time                 | Click the drop-down menus to set local date and time of the system.  |
| Time Zone                   | Click the drop-down menu to select a system time zone.   |
| Daylight Saving Time        | Click the drop-down menu to enable or disable the daylight saving time settings.   |
| Daylight Saving Time Offset | Enter the offsetting variable in seconds to adjust for daylight saving time.   |

| Item               | Description   |
|--------------------|---|
| Recurring From     | Click the drop-down menu to designate the start date and time for daylight saving time.                     |
| Recurring To       | Click the drop-down menu to designate the end date and time for daylight saving time.                       |
| Non-Recurring From | Click the drop-down menu to designate a start date and time for a non-recurring daylight saving time event. |
| Non-Recurring To   | Click the drop-down menu to designate the end date and time for a non-recurring daylight saving time event. |
| Apply              | Click <b>Apply</b> to save the values and update the screen.  |

The ensuing table for **System Time Information** settings are informational only: Current Date/Time, SNTP, SNTP Server Address, SNTP Server Port, Time zone, Daylight Saving Time, Daylight Saving Time Offset, From and To.

#### 4.4.7 Network Port

This function provides several parameters with which to configure ports to maximize access to the system.

To access this page, click **System > Network Port**.

The screenshot shows a web interface for 'Network Port Settings'. It features four rows of configuration options, each with a label and a text input field containing a default value:
 

- HTTP**: 80
- HTTPS**: 443
- TELNET**: 23
- SSH**: 22

 At the bottom of the form is a blue 'Apply' button.

**Figure 4.16 System > Network Port**

The following table describes the items in the previous figure.

| Item   | Description   |
|--------|---|
| HTTP   | Enter the value to designate the port number for the HTTP protocol (default: 80).         |
| HTTPS  | Enter the value to designate the port number for the HTTPS protocol (default: 443).       |
| TELNET | Enter the value to designate the port number for the Telnet protocol (default: 23).       |
| SSH    | Enter the value to designate the port number for the Secure Shell protocol (default: 22). |
| Apply  | Click <b>Apply</b> to save the values and update the screen.                              |

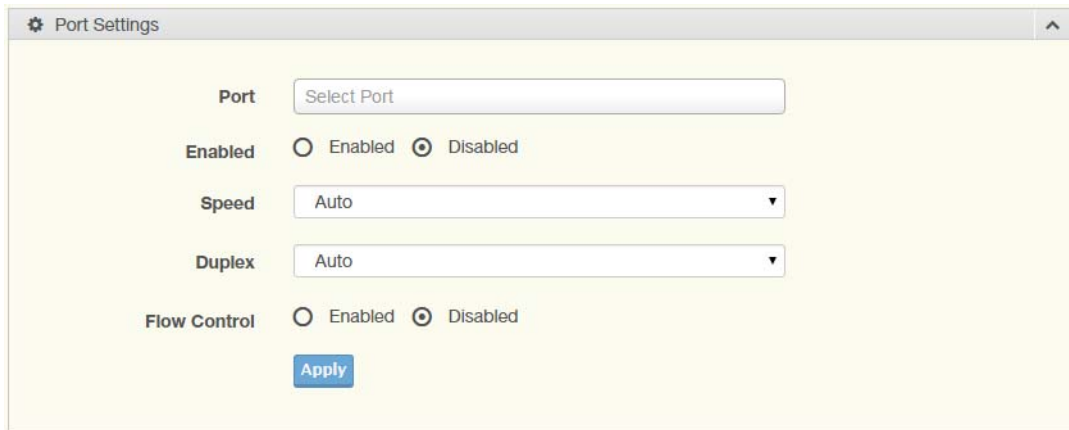
The ensuing table for **Network Port Information** settings are informational only: HTTP, HTTPS, TELNET and SSH.

## 4.5 L2 Switching

### 4.5.1 Port Configuration

Port Configuration describes how to use the user interface to configure LAN ports on the switch.

To access this page, click **L2 Switching > Port Configuration**.



**Figure 4.17 L2 Switching > Port Configuration**

The following table describes the items in the previous figure.

| Item         | Description  |
|--------------|--|
| Port         | Click the drop-down menu to select the port for the L2 Switch setting.   |
| Enabled      | Click the radio-button to enable or disable the Port Setting function.   |
| Speed        | Click the drop-down menu to select the port speed: Auto, Auto-10M, Auto-100M, Auto-1000M, Auto-10/100M, 10M, 100M, or 1000M. |
| Duplex       | Click the drop-down menu to select the duplex setting: Half or Full.   |
| Flow Control | Click the radio button to enable or disable the flow control function.   |
| Apply        | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **Port Status** settings are informational only: Port, **Edit** (click to enter description), Enable State, Link Status, Speed, Duplex, FlowCtrl Config and FlowCtrl Status.

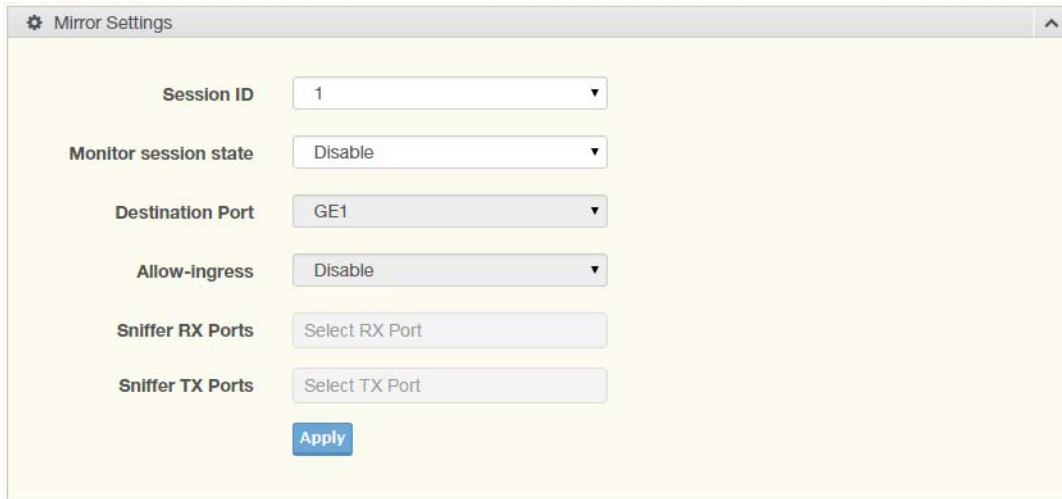


## 4.5.2 Port Mirror

Port mirroring function allows the sending of a copy of network packets seen on one switch port to a network monitoring connection on another switch port. Port mirroring can be used to analyze and debug data or diagnose errors on a network or to mirror either inbound or outbound traffic (or both).

There are no preset values in the Port Mirror. The displayed values do not represent the actual setting values.

To access this page, click **L2 Switching > Port Mirror**.



**Figure 4.18 L2 Switching > Port Mirror**

The following table describes the items in the previous figure.

| Item                  | Description   |
|-----------------------|---|
| Session ID            | Click the drop-down menu to select a port mirroring session from the list. The number of sessions allowed is platform specific. |
| Monitor session state | Click the drop-down menu to enable or disable the session mode for a selected session ID.                                       |
| Destination Port      | Click the drop-down menu to select the destination port and receive all the traffic from configured mirrored port(s).           |
| Allow-ingress         | Click the drop-down menu to enable or disable the Allow-ingress function.   |
| Sniffer RX Ports      | Enter the variable to define the RX port.   |
| Sniffer TX Ports      | Enter the variable to define the TX port.   |
| Apply                 | Click <b>Apply</b> to save the values and update the screen.  |

The ensuing table for **Mirror Status** settings are informational only: Session ID, Destination Port, Ingress State, Source TX Port and Source RX Port.

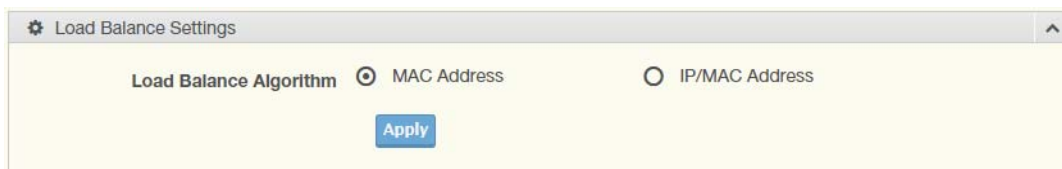
### 4.5.3 Link Aggregation

Link Aggregation is a method for combining multiple network connections in parallel in order to increase throughput beyond the capability of a single connection, and to provide redundancy in case one of the links should fail.

#### 4.5.3.1 Load Balance

The Load Balancing page allows you to select between a MAC Address or IP/MAC Address algorithm for the even distribution of IP traffic across two or more links.

To access this page, click **L2 Switching > Link Aggregation > Load Balance**.



**Figure 4.19 L2 Switching > Link Aggregation > Load Balance**

The following table describes the items in the previous figure.

| Item                   | Description   |
|------------------------|---|
| Load Balance Algorithm | Select the radio button to select the Load Balance Setting: MAC Address, IP/MAC Address or Source Port. |
| Apply                  | Click <b>Apply</b> to save the values and update the screen.  |

The ensuing table for **Load Balance Information** settings are informational only: Load Balance Algorithm.

#### 4.5.3.2 LAG Management

Link aggregation is also known as trunking. It is a feature available on the Ethernet gateway and is used with Layer 2 Bridging. Link aggregation allows for the logical merging of multiple ports into a single link.

To access this page, click **L2 Switching > Link Aggregation > LAG Management**.



**Figure 4.20 L2 Switching > Link Aggregation > LAG Management**

The following table describes the items in the previous figure.

| Item  | Description  |
|-------|--|
| LAG   | Click the drop-down menu to select the designated trunk group: Trunk 1 ~8. |
| Name  | Enter an entry to specify the LAG name.                                    |
| Type  | Click the radio button to specify the type mode: Static or LACP.           |
| Ports | Click the drop-down menu to select designated ports: FE1-8 or GE1-2.       |
| Apply | Click <b>Apply</b> to save the values and update the screen.               |

The ensuing table for **LAG Management Information** settings are informational only: LAG, Name, Type, Link State, Active Member, Standby Member, **Edit** (click to modify the settings) and **Clear** (click to load default settings).

#### 4.5.3.3 LAG Port Settings

The LAG Port Settings page allows you to enable or disable, set LAG status, speed and flow control functions.

In this example we will configure a LAG between the following switches:

To access this page, click **L2 Switching > Link Aggregation > LAG Port Settings**.

**Figure 4.21 L2 Switching > Link Aggregation > LAG Port Settings**

The following table describes the items in the previous figure.

| Item         | Description  |
|--------------|--|
| LAG Select   | Click the drop-down menu to select a predefined LAG trunk definition: LAG 1-8.   |
| Enabled      | Click the radio button to enable or disable the LAG Port.  |
| Speed        | Click the drop-down menu to select the port speed: Auto, Auto-10M, Auto-100M, Auto-1000M, Auto-10/100M, 10M, 100M, or 1000M. |
| Flow Control | Click the radio button to enable or disable the Flow Control for the LAG Port.   |
| Apply        | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **LAG Port Status** settings are informational only: LAG, Description, Port Type, Enable State, Link Status, Speed, Duplex, FlowCtrl Config and FlowCtrl Status.

#### 4.5.3.4 LACP Priority Settings

The LACP Priority Settings page allows you to configure the system priority for LACP.

To access this page, click **L2 Switching > Link Aggregation > LACP Priority Settings**.

**Figure 4.22 L2 Switching > Link Aggregation > LACP Priority Settings**

The following table describes the items in the previous figure.

| Item            | Description  |
|-----------------|--|
| System Priority | Enter the value (1-65535) to designate the LACP system priority. |
| Apply           | Click <b>Apply</b> to save the values and update the screen.     |

The ensuing table for **LACP Information** settings are informational only: System Priority.

#### 4.5.3.5 LACP Port Settings

Link Aggregation Control Protocol (LACP) provides a method to control the bundling of several physical ports together to form a single logical channel. By configuring the LACP function, the switch can negotiate an automatic bundling of links by sending LACP packets to the peer device (also implementing LACP).

To access this page, click **L2 Switching > Link Aggregation > LACP Port Settings**.

**Figure 4.23 L2 Switching > Link Aggregation > LACP Port Settings**

The following table describes the items in the previous figure.

| Item        | Description  |
|-------------|--|
| Port Select | Select a port for the LACP Port Settings. The listed available settings are: FE1-FE8, GE1-GE2. However, the available settings are dependent on the connected LACP device and may not be listed as displayed in the current figure.                    |
| Priority    | Enter a variable (1 to 65535) to assign a priority to the defined port selection.  |
| Timeout     | Click the radio button to select a long or short timeout period.   |
| Mode        | Click the radio button to select the setting mode: Active or Passive. <ul style="list-style-type: none"> <li>■ Active: Enables LACP unconditionally.</li> <li>■ Passive: Enables LACP only when an LACP device is detected (default state).</li> </ul> |
| Apply       | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **LACP Port Information** settings are informational only: Port Name, Priority, Timeout and Mode.

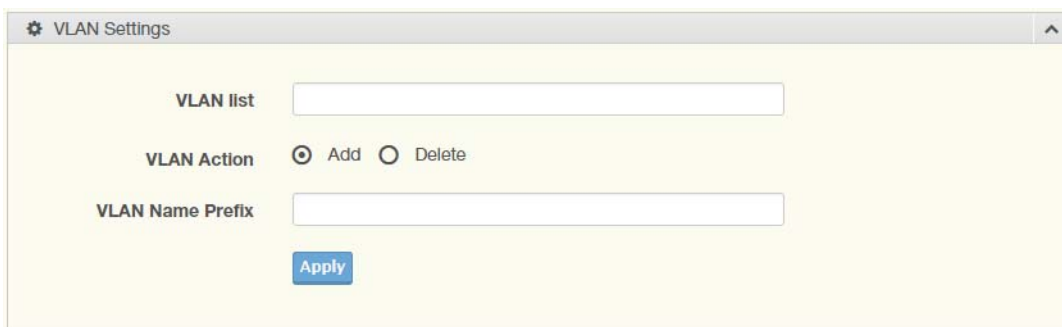
## 4.5.4 802.1Q VLAN

The 802.1Q VLAN feature allows for a single VLAN to support multiple VLANs. With the 802.1Q feature you can preserve VLAN IDs and segregate different VLAN traffic. The 802.1Q VLAN tag feature encapsulates the 802.1Q VLAN tagging within another 802.1Q VLAN tag. The outer tag is assigned following the AP group, while the inner VLAN ID is assigned dynamically by the AAA server.

### 4.5.4.1 VLAN Management

The management of VLANs is available through the VLAN Settings page. Through this page you can add or delete VLAN listings and add a prefix name to an added entry.

To access this page, click **L2 Switching > 802.1Q VLAN > VLAN Management**.



**Figure 4.24 L2 Switching > 802.1Q VLAN > VLAN Management**

The following table describes the items in the previous figure.

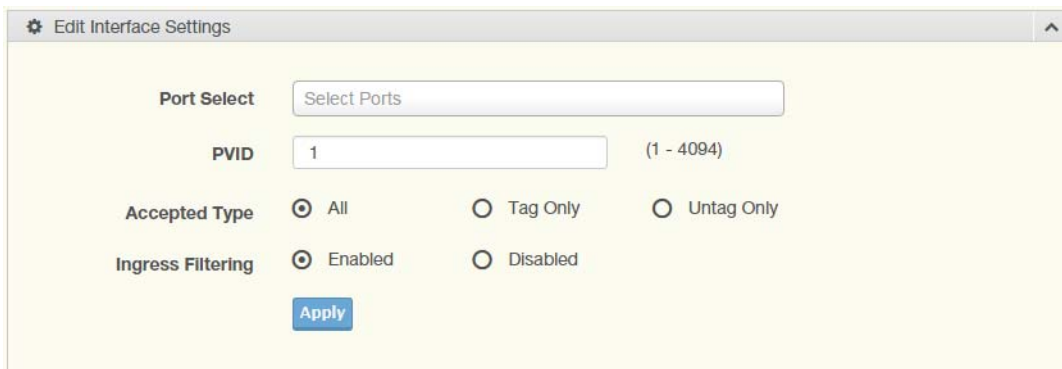
| Item                    | Description   |
|-------------------------|---|
| VLAN Action             | Click the radio button to add or delete the VLAN entry shown in the previous field. |
| VLAN list               | Enter the name of the VLAN entry to setup.  |
| VLAN Name / VLAN Prefix | Enter the prefix to be used by the VLAN list entry in the previous field.           |
| Apply                   | Click <b>Apply</b> to save the values and update the screen.                        |

The ensuing table for **VLAN Table** settings are informational only: VLAN ID, VLAN Name, VLAN Type and **Edit** (click to enter VLAN name).

### 4.5.4.2 PVID Settings

The PVID Settings page allows you to designate a PVID for a selected port, define the accepted type and enable/disable the ingress filtering.

To access this page, click **L2 Switching > 802.1Q VLAN > PVID Settings**.



**Figure 4.25 L2 Switching > 802.1Q VLAN > PVID Settings**

The following table describes the items in the previous figure.

| Item              | Description  |
|-------------------|--|
| Port Select       | Click the drop-down menu to select a port and edit its settings: FE1-FE8, GE1-GE2, or Trunk1 - Trunk8.   |
| PVID              | Enter the VLAN ID you want assigned to untagged or priority tagged frames received on this port. The value ranges 1 to 4094. The default is 1.   |
| Accepted Type     | Click the radio button to specify which frames to forward.<br>Tag Only discards any untagged or priority tagged frames.<br>Untag Only discards any tagged frames.<br>All accepts all untagged and tagged frames.<br>Whichever you select, VLAN tagged frames are forwarded in accordance with the IEEE 802.1Q VLAN standard. The default is All. |
| Ingress Filtering | Click the radio button to specify how you want the port to handle tagged frames. If you enable Ingress Filtering, a tagged frame will be discarded if this port is not a member of the VLAN identified by the VLAN ID in the tag. If you select Disabled, all tagged frames will be accepted. The default is Disabled.                           |
| Apply             | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **Port VLAN Status** settings are informational only: Port, Interface VLAN Mode, PVID, Accept Frame Type and Ingress Filtering.

### 4.5.4.3 Port to VLAN

The Port to VLAN page allows you to add a port to a VLAN and select the related parameters.

To access this page, click **L2 Switching > 802.1Q VLAN > Port to VLAN**.

VLAN ID :

| Port   | Interface VLAN Mode | Membership  | PVID |
|--------|---------------------|---|------|
| GE1    | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| GE2    | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| GE3    | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| GE4    | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| GE5    | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| GE6    | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| GE7    | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| GE8    | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| GE9    | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| GE10   | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| Trunk1 | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| Trunk2 | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| Trunk3 | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| Trunk4 | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| Trunk5 | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| Trunk6 | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| Trunk7 | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |
| Trunk8 | Hybrid              | <input type="radio"/> Forbidden <input type="radio"/> Excluded <input type="radio"/> Tagged <input checked="" type="radio"/> Untagged | YES  |

**Figure 4.26 L2 Switching > 802.1Q VLAN > Port to VLAN**

The following table describes the items in the previous figure.

| Item                | Description   |
|---------------------|---|
| Port                | Displays the assigned port to the entry.  |
| Interface VLAN Mode | Displays the assigned mode to the listed VLAN port. <ul style="list-style-type: none"> <li>■ Hybrid: Port hybrid model.</li> <li>■ Access: Port hybrid model.</li> <li>■ Trunk: Port hybrid model.</li> <li>■ Tunnel: Port hybrid model.</li> </ul> |
| Membership          | Displays the assigned membership status of the port entry, options include: Forbidden, Excluded Tagged or Untagged.   |
| Apply               | Click <b>Apply</b> to save the values and update the screen.  |

#### 4.5.4.4 Port-VLAN Mapping

To access this page, click **L2 Switching > 802.1Q VLAN > Port-VLAN Mapping**.

The ensuing table for **Port-VLAN Mapping Table** settings are informational only: Port, Mode, Administrative VLANs and Operational VLANs.

#### 4.5.5 Q-in-Q

Q-in-Q is commonly referred as VLAN stacking in which VLANs are nested by adding two tags to each frame instead of one. Network service provider and users both can use VLANs and makes it possible to have more than the 4094 separate VLANs allowed by 802.1Q.

There are three ways in which a machine can be connected to a network carrying double-tagged 802.1ad traffic:

- via a untagged port, where both inner and outer VLANs are handled by the switch or switches (so the attached machine sees ordinary Ethernet frames);
- via a single-tagged (tunnel) port, where the outer VLAN only is handled by the switch (so the attached machine sees single-tagged 802.1Q VLAN frames); or
- via a double-tagged (trunk) port, where both inner and outer VLANs are handled by the attached machine (which sees double-tagged 802.1ad VLAN frames).

##### 4.5.5.1 Global Settings

The Global Settings page allows you to set the outer VLAN Ethertype setting.

To access this page, click **L2 Switching > Q-in-Q > Global Settings**.



**Figure 4.27 L2 Switching > Q-in-Q > Global Settings**

The following table describes the items in the previous figure.

| Item                 | Description   |
|----------------------|---|
| Outer VLAN Ethertype | Enter the outer VLAN handled by the switch giving the attached machine a single-tagged 802.1Q VLAN frame. |
| Apply                | Click <b>Apply</b> to save the values and update the screen.  |

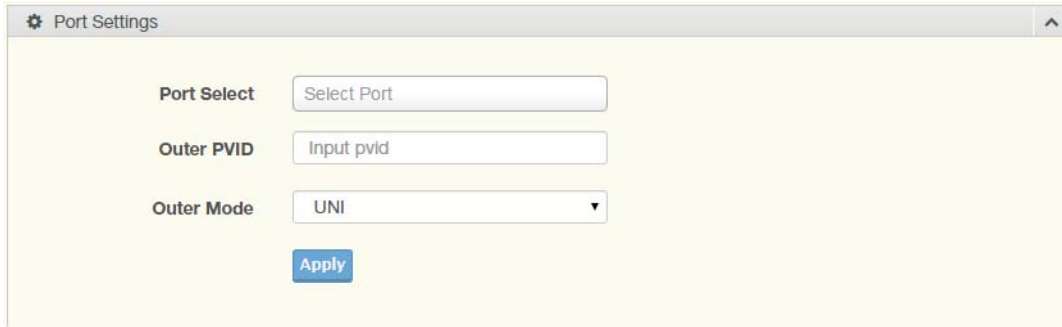
The ensuing table for **QinQ Global Information** settings are informational only: Outer VLAN Ethertype.



### 4.5.5.2 Port Settings

The Port Settings page allows you to define the outer PVID and outer mode for a selected port.

To access this page, click **L2 Switching > Q-in-Q > Port Settings**.



**Figure 4.28 L2 Switching > Q-in-Q > Port Settings**

The following table describes the items in the previous figure.

| Item        | Description   |
|-------------|---|
| Port Select | Enter the switch port (part of VLAN configuration) to configure the selection as a tunnel port.   |
| Outer PVID  | Enter the Port VLAN ID (PVID) to assigned the native VLAN ID. All untagged traffic coming in or out of the 802.1Q port is forwarded based on the PVID value   |
| Outer Mode  | Click the drop-down menu to select between UNI or NNI role. <ul style="list-style-type: none"><li>■ UNI: Selects a user-network interface which specifies communication between the specified user and a specified network.</li><li>■ NNI: Selects a network-to-network interface which specifies communication between two specified networks.</li></ul> |
| Apply       | Click <b>Apply</b> to save the values and update the screen.  |

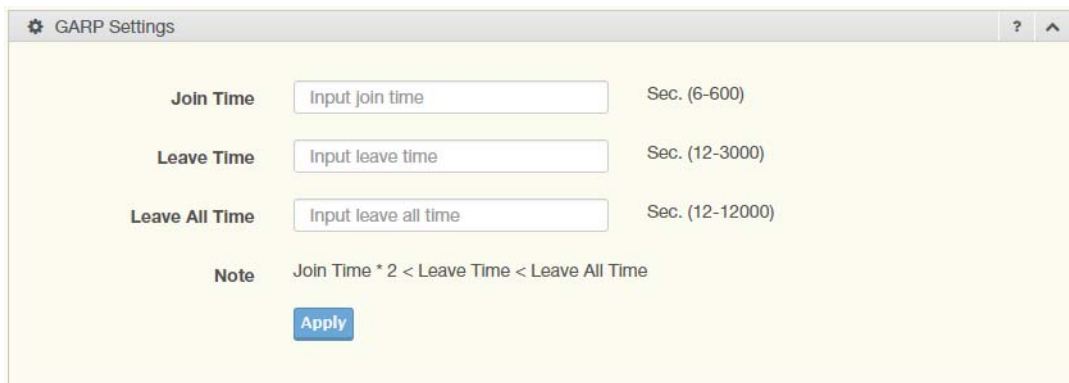
The ensuing table for **QinQ Port Information** settings are informational only: Port, Outer PVID and Outer Mode.

### 4.5.6 GARP

The Generic Attribute Registration Protocol (GARP) is a local area network (LAN) protocol. The protocol defines procedures for the registration and de-registration of attributes (network identifiers or addresses) by end stations and switches with each other.

### 4.5.6.1 GARP Settings

To access this page, click **L2 Switching > GARP > GARP Settings**.



**Figure 4.29 L2 Switching > GARP > GARP Settings**

The following table describes the items in the previous figure.

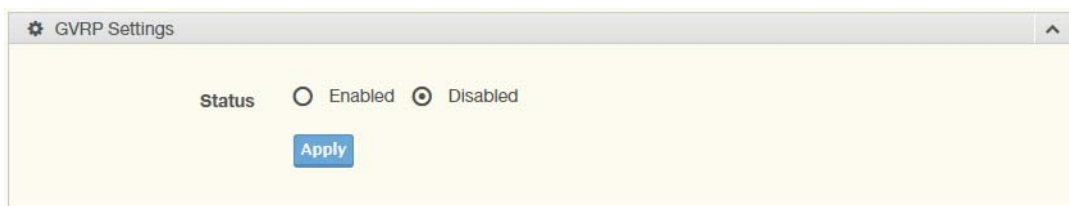
| Item           | Description  |
|----------------|--|
| Join Time      | Enter a value to specify the time between the transmission of GARP PDUs registering (or re-registering) membership for a VLAN or multicast group in centiseconds. Enter a number between 6 and 600. An instance of this timer exists for each GARP participant for each port.  |
| Leave Time     | Enter a value to specify the time to wait after receiving an unregister request for a VLAN or multicast group before deleting the associated entry, in centiseconds. This allows time for another station to assert registration for the same attribute in order to maintain uninterrupted service. Enter a number between 12 and 3000. An instance of this timer exists for each GARP participant for each port.  |
| Leave All Time | Enter a value to specify the Leave All Time controls how frequently Leave All PDUs are generated. A LeaveAll PDU indicates that all registrations will shortly be deregistered. Participants will need to rejoin in order to maintain registration. The Leave All Period Timer is set to a random value in the range of LeaveAllTime to 1.5*LeaveAllTime. The timer is specified in centiseconds. Enter a number between 12 and 12000. An instance of this timer exists for each GARP participant for each port. |
| Apply          | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **GARP Information** settings are informational only: Join Time, Leave Time and Leave All Time.

### 4.5.6.2 GVRP Settings

The GVRP Settings page allows you to enable or disable the GVRP (GARP VLAN Registration Protocol or Generic VLAN Registration Protocol) protocol which facilitates control of virtual local area networks (VLANs) within a larger network.

To access this page, click **L2 Switching > GARP > GVRP Settings**.



**Figure 4.30 L2 Switching > GARP > GVRP Settings**

The following table describes the items in the previous figure.

| Item   | Description  |
|--------|--|
| Status | Click to enable or disable the GARP VLAN Registration Protocol administrative mode for the switch. The factory default is Disable. |
| Apply  | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **GVRP Information** settings are informational only: GVRP.


## 4.5.7 802.3az EEE

The 802.3az Energy Efficient Ethernet (EEE) innovative green feature reduces energy consumption through intelligent functionality:

- Traffic detection — Energy Efficient Ethernet (EEE) compliance
- Inactive link detection

Inactive link detection function automatically reduces power usage when inactive links or devices are detected.

To access this page, click **L2 Switching > 802.3az EEE**.



**Figure 4.31 L2 Switching > 802.3az EEE**

The following table describes the items in the previous figure.

| Item        | Description   |
|-------------|---|
| Port Select | Enter the port to setup the EEE function.   |
| State       | Click <b>Enabled</b> or <b>Disabled</b> to set the state mode of the port select setting. |
| Apply       | Click <b>Apply</b> to save the values and update the screen.                              |

The ensuing table for **EEE Enable Status** settings are informational only: Port and EEE State.

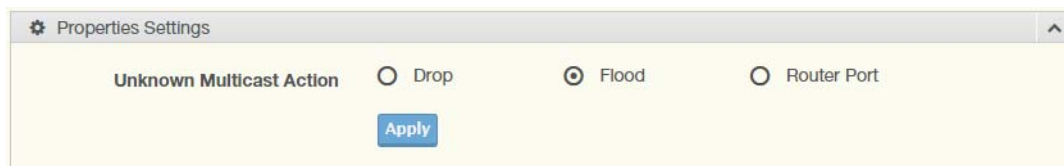
## 4.5.8 Multicast

Multicast forwarding allows a single packet to be forwarded to multiple destinations. The service is based on L2 switch receiving a single packet addressed to a specific Multicast address. Multicast forwarding creates copies of the packet, and transmits the packets to the relevant ports.

### 4.5.8.1 Multicast Filtering

The Multicast Filtering page allows for the definition of action settings when an unknown multicast request is received. The options include: Drop, Flood, or Router Port.

To access this page, click **L2 Switching > Multicast > Multicast Filtering**.



**Figure 4.32 L2 Switching > Multicast > Multicast Filtering**

The following table describes the items in the previous figure.

| Item                     | Description   |
|--------------------------|---|
| Unknown Multicast Action | Select the configuration protocol: Drop, Flood, or Router Port, to apply for any unknown multicast event. |
| Apply                    | Click <b>Apply</b> to save the values and update the screen.  |

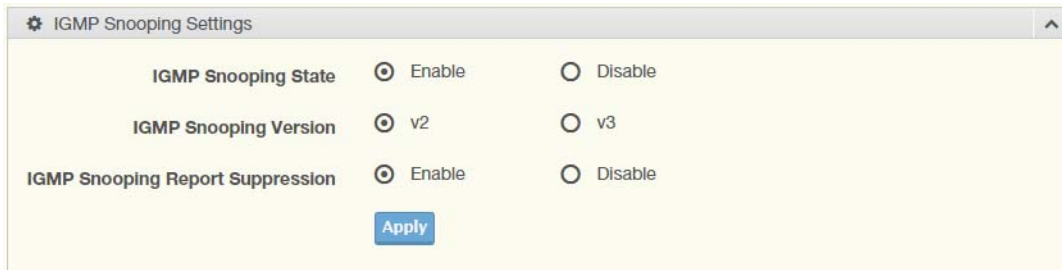
The ensuing table for **Properties Information** settings are informational only: Unknown Multicast Action.

#### 4.5.8.2 IGMP Snooping

IGMP Snooping is defined as the process of listening to Internet Group Management Protocol (IGMP) network traffic. IGMP Snooping allows a network switch to listen in on the IGMP conversation between hosts and routers and maintain a map of which links need which IP multicast streams. Multicasts can be filtered from the links which do not need them in turn controlling which ports receive specific multicast traffic.

##### IGMP Settings

To access this page, click **L2 Switching > Multicast > IGMP Snooping > IGMP Settings**.



**Figure 4.33 L2 Switching > Multicast > IGMP Snooping > IGMP Settings**

The following table describes the items in the previous figure.

| Item                             | Description   |
|----------------------------------|---|
| IGMP Snooping State              | Select <b>Enable</b> or <b>Disable</b> to designate the IGMP Snooping State.              |
| IGMP Snooping Version            | Select designate the IGMP Snooping Version: V2 or V3.                                     |
| IGMP Snooping Report Suppression | Select <b>Enable</b> or <b>Disable</b> to setup the report suppression for IGMP Snooping. |
| Apply                            | Click <b>Apply</b> to save the values and update the screen.                              |

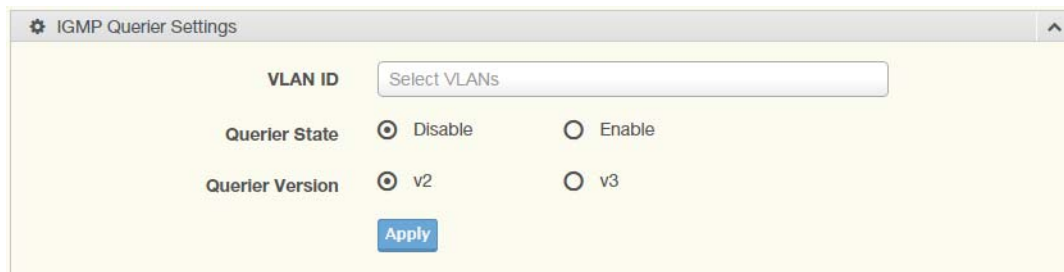
The ensuing table for **IGMP Snooping Information** settings are informational only: IGMP Snooping State, IGMP Snooping Version and IGMP Snooping V2 Report Suppression.

The ensuing table for **IGMP Snooping Table** settings are informational only: Entry No., VLAN ID, IGMP Snooping Operation State, Router Ports Auto Learn, Query Robustness, Query Interval (sec.), Query Max Response Interval (sec.), Last Member Query count, Last Member Query Interval (sec), Immediate Leave and **Edit** (click to modify the settings).

## IGMP Querier

IGMP Querier allows snooping to function by creating the tables for snooping. General queries must be unconditionally forwarded by all switches involved in IGMP snooping.

To access this page, click **L2 Switching > Multicast > IGMP Snooping > IGMP Querier**.



**Figure 4.34 L2 Switching > Multicast > IGMP Snooping > IGMP Querier**

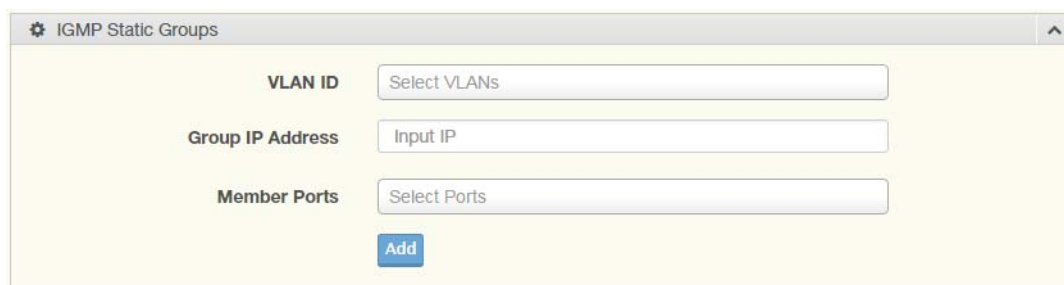
The following table describes the items in the previous figure.

| Item            | Description   |
|-----------------|---|
| VLAN ID         | Select the VLAN ID to define the local IGMP querier.                            |
| Querier State   | Select <b>Disable</b> or <b>Enable</b> to configure the VLAN ID (IGMP Querier). |
| Querier Version | Select the querier version (V2 or V3) designated to the selected VLAN ID.       |
| Apply           | Click <b>Apply</b> to save the values and update the screen.                    |

The ensuing table for **IGMP Querier Status** settings are informational only: VLAN ID, Querier State, Querier Status, Querier Version and Querier IP.

## IGMP Static Groups

To access this page, click **L2 Switching > Multicast > IGMP Snooping > IGMP Static Groups**.



**Figure 4.35 L2 Switching > Multicast > IGMP Snooping > IGMP Static Groups**

The following table describes the items in the previous figure.

| Item             | Description  |
|------------------|--|
| VLAN ID          | Select the VLAN ID to define IGMP static group.            |
| Group IP Address | Enter the IP address assigned to the VLAN ID.              |
| Member Ports     | Enter the port numbers to associate with the static group. |
| Add              | Click <b>Add</b> to add an IGMP group.                     |

The ensuing table for **IGMP Static Groups Status** settings are informational only: VLAN ID, Group IP Address, Member Ports and Modify.

## Multicast Groups

To access this page, click **L2 Switching > Multicast > IGMP Snooping > Multicast Groups**.

The ensuing table for **Multicast Groups** settings are informational only: VLAN ID, Group IP Address, Member Ports, Type and Life (Sec).

## Router Ports

To access this page, click **L2 Switching > Multicast > IGMP Snooping > Router Ports**.

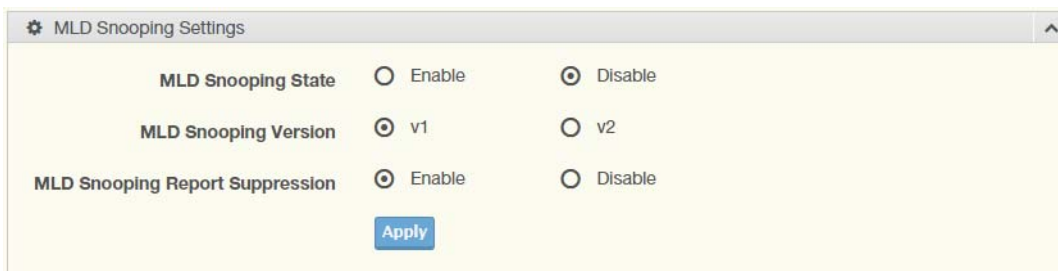
The ensuing table for **Router Ports** settings are informational only: VLAN ID, Port and Expiry Time (Sec).

### 4.5.8.3 MLD Snooping

The MLD Snooping page allows you to select the snooping status (enable or disable), the version (v1 or v2) and the enabling/disabling of the report suppression for the MLD querier, which sends out periodic general MLD queries and are forwarded through all ports in the VLAN.

## MLD Settings

To access this page, click **L2 Switching > Multicast > MLD Snooping > MLD Settings**.



**Figure 4.36 L2 Switching > Multicast > MLD Snooping > MLD Settings**

The following table describes the items in the previous figure.

| Item                            | Description   |
|---------------------------------|---|
| MLD Snooping State              | Select <b>Enable</b> or <b>Disable</b> to setup the MLD Snooping State.                   |
| MLD Snooping Version            | Select the querier version (V1 or V2) designated to the MLD Snooping Version.             |
| MLD Snooping Report Suppression | Select <b>Enable</b> or <b>Disable</b> to designate the status of the report suppression. |
| Apply                           | Click <b>Apply</b> to save the values and update the screen.                              |

The ensuing table for **MLD Snooping Information** settings are informational only: MLD Snooping State, MLD Snooping Version and MLD Snooping V2 Report Suppression.

The ensuing table for **MLD Snooping Table** settings are informational only: Entry No., VLAN ID, MLD Snooping Operation State, Router Ports Auto Learn, Query Robustness, Query Interval (sec.), Query Max Response Interval (sec.), Last Member Query count, Last Member Query Interval (sec), Immediate Leave and **Edit** (click to modify the settings).

## MLD Querier

The MLD Querier page allows you to select and enable/disable the MLD querier and define the version (IGMPv1 or IGMPv2) when enabled.

To access this page, click **L2 Switching > Multicast > MLD Snooping > MLD Querier**.

**Figure 4.37 L2 Switching > Multicast > MLD Snooping > MLD Querier**

The following table describes the items in the previous figure.

| Item            | Description  |
|-----------------|--|
| VLAN ID         | Enter the VLAN ID to configure.  |
| Querier State   | Select <b>Enable</b> or <b>Disable</b> status on the selected VLAN. <ul style="list-style-type: none"> <li>■ Enable: Enable IGMP Querier Election.</li> <li>■ Disable: Disable IGMP Querier Election.</li> </ul> |
| Querier Version | Select the querier version (IGMPV1 or IGMPV2) designated to the MLD Querier function.  |
| Apply           | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **MLD Querier Status** settings are informational only: VLAN ID, Querier State, Querier Status, Querier Version and Querier IP.

## MLD Static Group

The MLD Static Group page allows you to configure specified ports as static member ports.

To access this page, click **L2 Switching > Multicast > MLD Snooping > MLD Static Group**.

**Figure 4.38 L2 Switching > Multicast > MLD Snooping > MLD Static Group**

The following table describes the items in the previous figure.

| Item             | Description   |
|------------------|---|
| VLAN ID          | Enter the VLAN ID to define the local MLD Static Group. |
| Group IP Address | Enter the IP address associated with the static group.  |
| Member Ports     | Enter the ports designated with the static group.       |
| Add              | Click <b>Add</b> to add a MLD static group.             |

The ensuing table for **MLD Static Groups Status** settings are informational only: VLAN ID, Group IP Address, Member Ports and Modify.



## Multicast Groups

To access this page, click **L2 Switching > Multicast > MLD Snooping > Multicast Groups**.

The ensuing table for **Multicast Groups** settings are informational only: ID, Group IP Address, Member Ports, Type and Life (Sec).

## Router Ports

To access this page, click **L2 Switching > Multicast > MLD Snooping > Router Ports**.

The ensuing table for **Router Ports** settings are informational only: VLAN ID, Port and Expiry Time (Sec).

## 4.5.9 Jumbo Frame

Jumbo frames are frames larger than the standard Ethernet frame size of 1518 bytes. The Jumbo Frame function allows the configuration of Ethernet frame size.

To access this page, click **L2 Switching > Jumbo Frame**.



**Figure 4.39 L2 Switching > Jumbo Frame**

The following table describes the items in the previous figure.

| Item                | Description  |
|---------------------|--|
| Jumbo Frame (Bytes) | Enter the variable in bytes (1518 to 9216) to define the jumbo frame size. |
| Apply               | Click <b>Apply</b> to save the values and update the screen.               |

The ensuing table for **Jumbo Frame Config** settings are informational only: Jumbo Frame (Bytes).

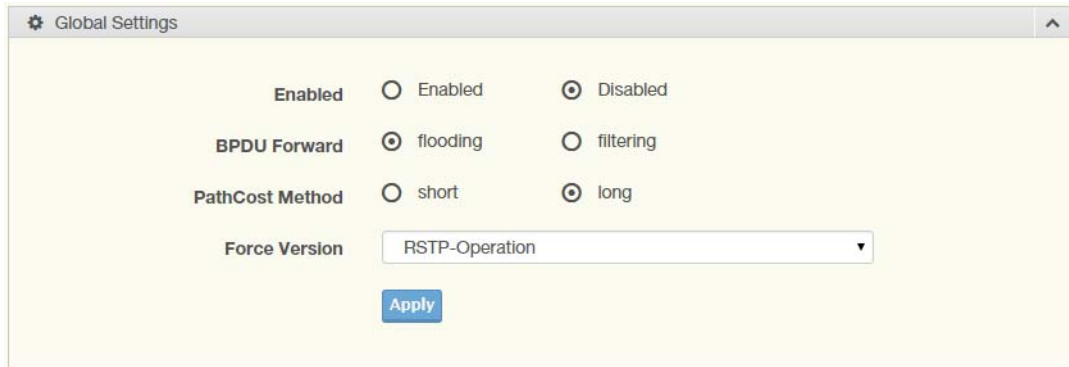
## 4.5.10 Spanning Tree

The Spanning Tree Protocol (STP) is a network protocol to ensure loop-free topology for any bridged Ethernet local area network.

### 4.5.10.1 STP Global Settings

The STP Global Settings page allows you to set the STP status, select the configuration for a BPDU packet, choose the path overhead, force version and set the configuration revision range.

To access this page, click **L2 Switching > Spanning Tree > STP Global Settings**.



**Figure 4.40 L2 Switching > Spanning Tree > STP Global Settings**

The following table describes the items in the previous figure.

| Item            | Description  |
|-----------------|--|
| Enabled         | Click the radio-button to enable or disable the STP status.  |
| BPDU Forward    | Select <b>flooding</b> or <b>filtering</b> to designate the type of BPDU packet.   |
| PathCost Method | Select short or long to define the method of used for path cost calculations.  |
| Force Version   | Click the drop-down menu to select the operating mode for STP. <ul style="list-style-type: none"><li>■ STP-Compatible: 802.1D STP operation.</li><li>■ RSTP-Operation: 802.1w operation.</li><li>■ MSTP-Operation: 802.1s operation.</li></ul> |
| Apply           | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **STP Information** settings are informational only: STP, BPDU Forward, PathCost Method and Force Version.

### 4.5.10.2 STP Port Settings

The STP Port Settings page allows you to configure the ports for the setting, port's contribution, configure edge port, and set the status of the BPDU filter.

To access this page, click **L2 Switching > Spanning Tree > STP Port Settings**.

**Figure 4.41 L2 Switching > Spanning Tree > STP Port Settings**

The following table describes the items in the previous figure.

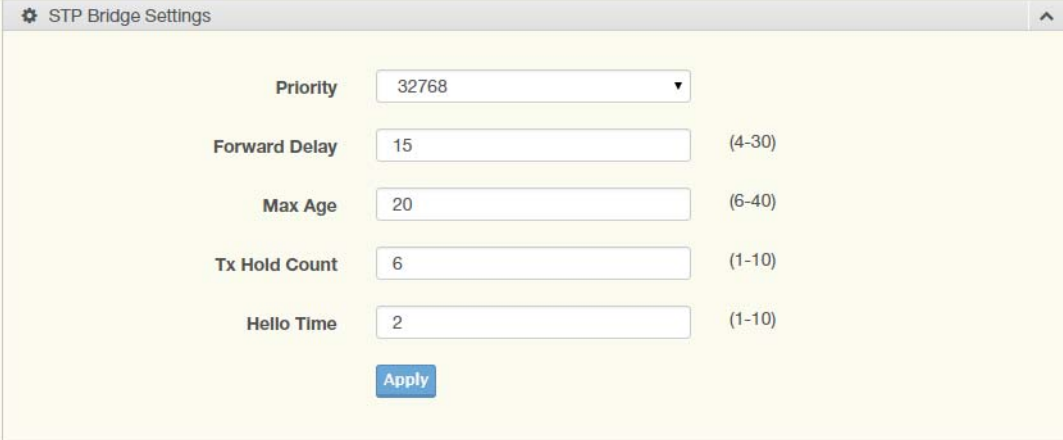
| Item                 | Description   |
|----------------------|---|
| Port Select          | Select the port list to specify the ports that apply to this setting.   |
| Admin Enable         | Select <b>Enabled</b> or <b>Disabled</b> to setup the admin profile for the STP port.   |
| Path Cost (0 = Auto) | Set the port's cost contribution. For a root port, the root path cost for the bridge. (0 means Auto).   |
| Edge Port            | Click the drop-down menu to set the edge port configuration. <ul style="list-style-type: none"> <li>■ No: Force to false state (as link to a bridge).</li> <li>■ Yes: Force to true state (as link to a host).</li> </ul>                     |
| P2P MAC              | Click the drop-down menu to set the Point-to-Point port configuration. <ul style="list-style-type: none"> <li>■ No: Force to false state.</li> <li>■ Yes: Force to true state.</li> </ul>   |
| Migrate              | Click the check box to enable the migrate function. Forces the port to use the new MST/RST BPDUs, requiring the switch to test on the LAN segment. for the presence of legacy devices, which are not able to understand the new BPDU formats. |
| Apply                | Click <b>Apply</b> to save the values and update the screen.  |

The ensuing table for **STP Port Status** settings are informational only: Port, Admin Enable, Path Cost, Edge Port and P2P MAC.

### 4.5.10.3 STP Bridge Settings

The STP Bridge Settings page allows you to configure the priority, forward delay, maximum age, Tx hold count, and the hello time for the bridge.

To access this page, click **L2 Switching > Spanning Tree > STP Bridge Settings**.



**Figure 4.42 L2 Switching > Spanning Tree > STP Bridge Settings**

The following table describes the items in the previous figure.

| Item          | Description  |
|---------------|--|
| Priority      | Click the drop-down menu to select the STP bridge priority.                          |
| Forward Delay | Enter the variable (4 to 30) to set the forward delay for STP bridge settings.       |
| Max Age       | Enter the variable (6 to 40) to set the Max age for STP bridge settings.             |
| Tx Hold Count | Enter the variable (1 to 10) to designate the TX hold count for STP bridge settings. |
| Hello Time    | Enter the variable (1 to 10) to designate the Hello Time for STP bridge settings.    |
| Apply         | Click <b>Apply</b> to save the values and update the screen.                         |

The ensuing table for **STP Bridge Information** settings are informational only: Priority, Forward Delay, Max Age, Tx Hold Count and Hello Time.

The ensuing table for **STP Bridge Status** settings are informational only: Bridge Identifier, Designated Root Bridge, Root Path Cost, Designated Bridge, Root Port and Last Topology Change.

#### 4.5.10.4 STP Port Advanced Settings

The STP Port Advanced Settings page allows you to select the port list to apply this setting.

To access this page, click **L2 Switching > Spanning Tree > STP Port Advanced Settings**.



**Figure 4.43 L2 Switching > Spanning Tree > STP Port Advanced Settings**

The following table describes the items in the previous figure.

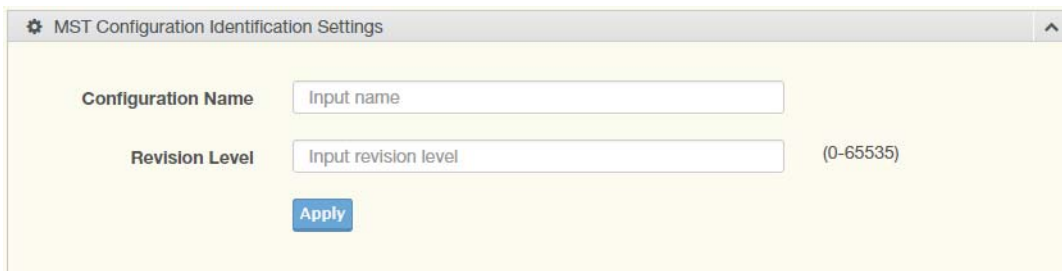
| Item        | Description  |
|-------------|--|
| Port Select | Select the port to designate the STP settings.               |
| Priority    | Click the drop-down menu to designate a priority.            |
| Apply       | Click <b>Apply</b> to save the values and update the screen. |

The ensuing table for **STP Port Status** settings are informational only: Port, Identifier (Priority / Port Id), Path Cost Conf/Oper, Designated Root Bridge, Root Path Cost, Designated Bridge, Edge Port Conf/Oper, P2P MAC Conf/Oper, Port Role and Port State.

#### 4.5.10.5 MST Config Identification

The MST Config Identification page allows you to configure the identification setting name and the identification range.

To access this page, click **L2 Switching > Spanning Tree > MST Config Identification**.



**Figure 4.44 L2 Switching > Spanning Tree > MST Config Identification**

The following table describes the items in the previous figure.

| Item               | Description  |
|--------------------|--|
| Configuration Name | Enter the identifier used to identify the configuration currently being used. It may be up to 32 characters. |
| Revision Level     | Enter the identifier for the Revision Configuration, range: 0 to 65535 (default: 0).                         |
| Apply              | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **MST Configuration Identification Information** settings are informational only: Configuration Name and Revision Level.

#### 4.5.10.6 MST Instance ID Settings

The MST Instance ID Settings page allows you to edit the MSTI ID and VID List settings.

To access this page, click **L2 Switching > Spanning Tree > MST Instance ID Settings**.



**Figure 4.45 L2 Switching > Spanning Tree > MST Instance ID Settings**

The following table describes the items in the previous figure.

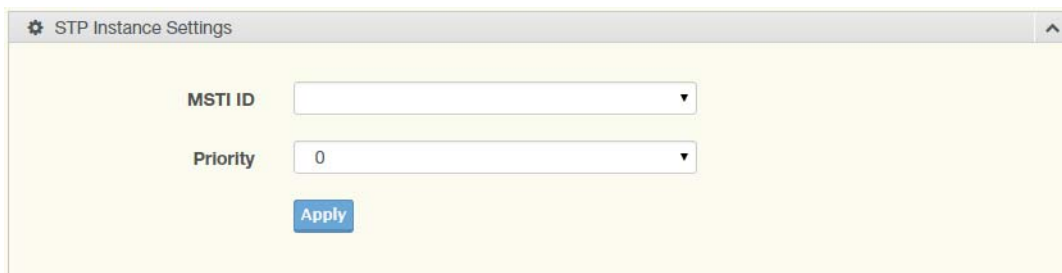
| Item     | Description   |
|----------|---|
| MSTI ID  | Enter the MST instance ID (0-15).                           |
| VID List | Enter the pre-configured VID list.                          |
| Move     | Click <b>Move</b> to save the values and update the screen. |

The ensuing table for **MST Instance ID Information** settings are informational only: MSTI ID and VID List.

#### 4.5.10.7 MST Instance Priority Settings

The MST Instance Priority Settings allows you to specify the MST instance and the bridge priority in that instance.

To access this page, click **L2 Switching > Spanning Tree > MST Instance Priority Settings**.



**Figure 4.46 L2 Switching > Spanning Tree > MST Instance Priority Settings**

The following table describes the items in the previous figure.

| Item     | Description  |
|----------|--|
| MSTI ID  | Click the drop-down menu to specify the MST instance.                          |
| Priority | Click the drop-down menu set the bridge priority in the specified MST instance |
| Apply    | Click <b>Apply</b> to save the values and update the screen.                   |

The ensuing table for **MST Instance Priority Information** settings are informational only: MSTI ID, Priority and Action.

#### 4.5.10.8 MST Instance Info

To access this page, click **L2 Switching > Spanning Tree > MST Instance Info**.

The ensuing table for **STP Bridge Status** settings are informational only: Bridge Identifier, Designated Root Bridge, Root Path Cost, Designated Bridge, Root Port and TCNLast Topology Change.

The ensuing table for **STP Port Status** settings are informational only: Port, Identifier (Priority / Port Id), Path Cost Conf/Oper, Designated Root Bridge, Root Path Cost, Designated Bridge, Edge Port Conf/Oper, P2P MAC Conf/Oper, Port Role and Port State.

#### 4.5.10.9 STP Statistics

To access this page, click **L2 Switching > Spanning Tree > STP Statistics**.

The ensuing table for **STP Statistics** settings are informational only: Port, Configuration BPDUs Received, TCN BPDUs Received, Configuration BPDUs Transmitted and TCN BPDUs Transmitted.

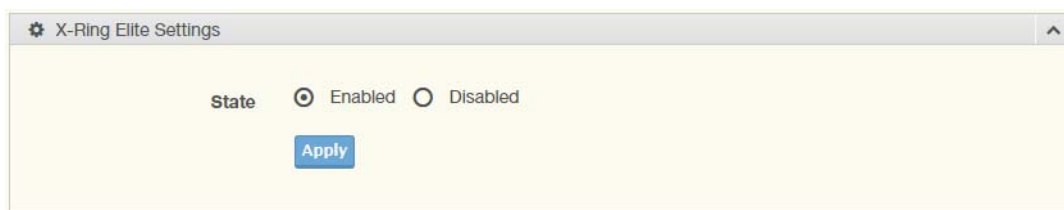
### 4.5.11 X-Ring Elite

The X-Ring Elite function provides an improvement over Spanning Tree and Rapid Spanning Tree and a rapid auto recovery in the event that the network suffers a corrupt or broken link and prevents network loops.

#### 4.5.11.1 X-Ring Elite Settings

The X-Ring Elite Settings allows you to enable or disable the state of the X-Ring settings.

To access this page, click **L2 Switching > X-Ring Elite > X-Ring Elite Settings**.



**Figure 4.47 L2 Switching > X-Ring Elite > X-Ring Elite Settings**

The following table describes the items in the previous figure.

| Item  | Description  |
|-------|--|
| State | Select <b>Enabled</b> or <b>Disabled</b> to setup the X-Ring Elite mode. |
| Apply | Click <b>Apply</b> to save the values and update the screen.             |

The ensuing table for **Information** settings are informational only: X-Ring Elite State.

#### 4.5.11.2 X-Ring Elite Groups

The X-Ring Elite Groups page allows you to select the function and role for each device and the connected ports.

To access this page, click **L2 Switching > X-Ring Elite > X-Ring Elite Groups**.



**Figure 4.48 L2 Switching > X-Ring Elite > X-Ring Elite Groups**

The following table describes the items in the previous figure.

| Item    | Description   |
|---------|---|
| Ring ID | Enter a number to specifies a ranging from 1 to 255 to identify a given X-Ring Elite group. |
| Role    | Click the drop-down menu to select the ring role.   |
| Port 1  | Click the drop-down menu to define the port designation.                                    |
| Port 2  | Click the drop-down menu to define the port designation.                                    |
| Add     | Click <b>Add</b> to save the values and update the screen.                                  |

The ensuing table for **Information** settings are informational only: Ring ID, Role, Port 1, Port 2 and **Delete** (click to delete the desired Ring ID).

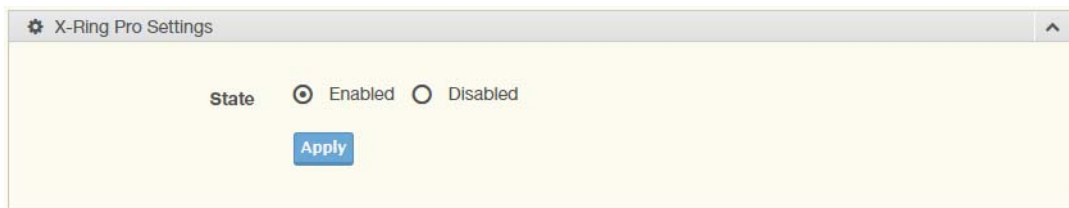
## 4.5.12 X-Ring Pro

The X-Ring Pro function provides an improvement over Spanning Tree and Rapid Spanning Tree and a rapid auto recovery in the event that the network suffers a corrupt or broken link and prevents network loops.

### 4.5.12.1 X-Ring Pro Settings

The X-Ring Pro Settings page allows you to configure the status (enabled or disabled) of the function.

To access this page, click **L2 Switching > X-Ring Pro > X-Ring Pro Settings**.



**Figure 4.49 L2 Switching > X-Ring Pro > X-Ring Pro Settings**

The following table describes the items in the previous figure.

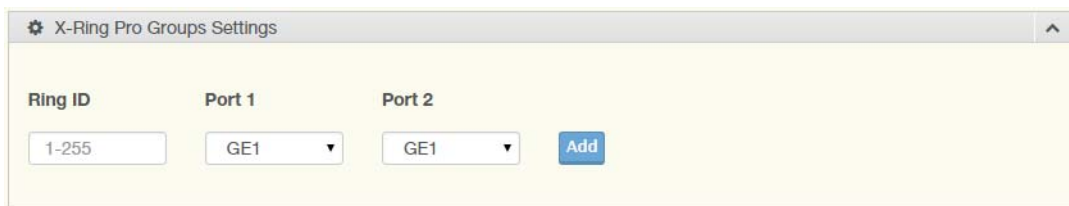
| Item  | Description  |
|-------|--|
| State | Select <b>Enabled</b> or <b>Disabled</b> to setup the X-Ring Pro mode. |
| Apply | Click <b>Apply</b> to save the values and update the screen.           |

The ensuing table for **Information** settings are informational only: X-Ring Pro State.

### 4.5.12.2 X-Ring Pro Groups

The X-Ring Pro Groups page allows you to select the function and role for each ring ID and its connected ports.

To access this page, click **L2 Switching > X-Ring Pro > X-Ring Pro Groups**.



**Figure 4.50 L2 Switching > X-Ring Pro > X-Ring Pro Groups > X-Ring Pro Groups Settings**



The following table describes the items in the previous figure.

| Item    | Description   |
|---------|---|
| Ring ID | Enter a number to specifies a ranging from 1 to 255 to identify a given X-Ring Pro group. |
| Port 1  | Click the drop-down menu to define the port designation.                                  |
| Port 2  | Click the drop-down menu to define the port designation.                                  |
| Add     | Click <b>Add</b> to save the values and update the screen.                                |

**Figure 4.51 L2 Switching > X-Ring Pro > X-Ring Pro Groups > Chain Settings**

The following table describes the items in the previous figure.

| Item          | Description  |
|---------------|--|
| Chain Ring ID | Enter a number to specifies a ranging from 1 to 255 to identify a chain ring ID. |
| Role          | Click the drop-down menu to select the ring role.                                |
| Head Port     | Click the drop-down menu to define the port designation.                         |
| Member Port   | Click the drop-down menu to define the port designation.                         |
| Add           | Click <b>Add</b> to save the values and update the screen.                       |

**Figure 4.52 L2 Switching > X-Ring Pro > X-Ring Pro Groups > Couple Setting**

The following table describes the items in the previous figure.

| Item           | Description   |
|----------------|---|
| Couple Ring ID | Enter a number to specifies a ranging from 1 to 255 to identify a given X-Ring group. |
| Port           | Enter the port to assign to define the couple setting.                                |
| Master Ring ID | Click the drop-down menu to designate the master ring.                                |
| Add            | Click <b>Add</b> to save the values and update the screen.                            |

**Figure 4.53 L2 Switching > X-Ring Pro > X-Ring Pro Groups > Pair Settings**

The following table describes the items in the previous figure.

| Item           | Description   |
|----------------|---|
| Pair Ring ID   | Enter a number to specifies a ranging from 1 to 255 to identify a pair ring ID. |
| Port           | Enter the port to assign to define the couple setting.                          |
| Master Ring ID | Click the drop-down menu to designate the master ring.                          |
| Add            | Click <b>Add</b> to save the values and update the screen.                      |

The ensuing table for **Information** settings are informational only: Ring ID, Mode, Operation State, Port 1, Forwarding State, Port 2, Forwarding State and **Delete** (click to delete the desired Ring ID).

### 4.5.13 Loopback Detection

The Loopback Detection function is used to detect looped links. By sending detection frames and then checking to see if the frames returned to any port on the device, the function is used to detect loops.

#### 4.5.13.1 Global Settings

The Global Settings page allows you to configure the state (enabled or disabled) of the function, select the interval at which frames are transmitted and the delay before recovery.

To access this page, click **L2 Switching > Loopback Detection > Global Settings**.

**Figure 4.54 L2 Switching > Loopback Detection > Global Settings**

The following table describes the items in the previous figure.

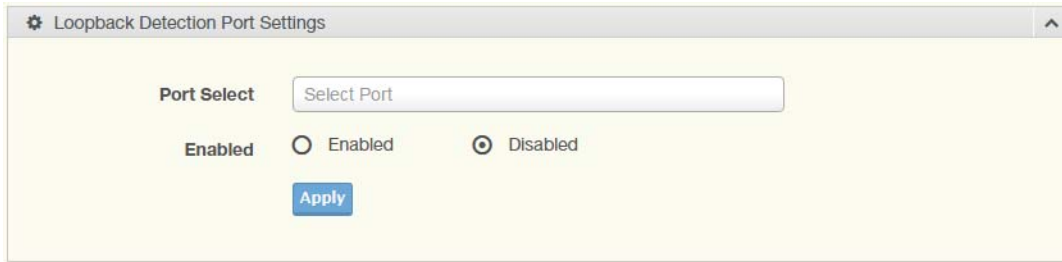
| Item         | Description   |
|--------------|---|
| State        | Select <b>Enabled</b> or <b>Disabled</b> to setup the loopback mode.                            |
| Interval     | Enter the variable in seconds (1 to 32767) to set the interval at which frames are transmitted. |
| Recover Time | Enter the variable in seconds (60 to 1000000) to define the delay before recovery.              |
| Apply        | Click <b>Apply</b> to save the values and update the screen.                                    |

The ensuing table for **Loopback Detection Global Information** settings are informational only: State, Interval and Recover Time.

### 4.5.13.2 Port Settings

The Port Settings page allows you to select ports that are detected by the loopback detection function and configure their status (enabled or disabled).

To access this page, click **L2 Switching > Loopback Detection > Port Settings**.



**Figure 4.55 L2 Switching > Loopback Detection > Port Settings**

The following table describes the items in the previous figure.

| Item        | Description  |
|-------------|--|
| Port Select | Enter the port to define the local loopback detection setting.                     |
| Enabled     | Select <b>Enabled</b> or <b>Disabled</b> to setup the Loopback Detection function. |
| Apply       | Click <b>Apply</b> to save the values and update the screen.                       |

The ensuing table for **Loopback Detection Port Information** settings are informational only: Port, Enable State and Loop Status.

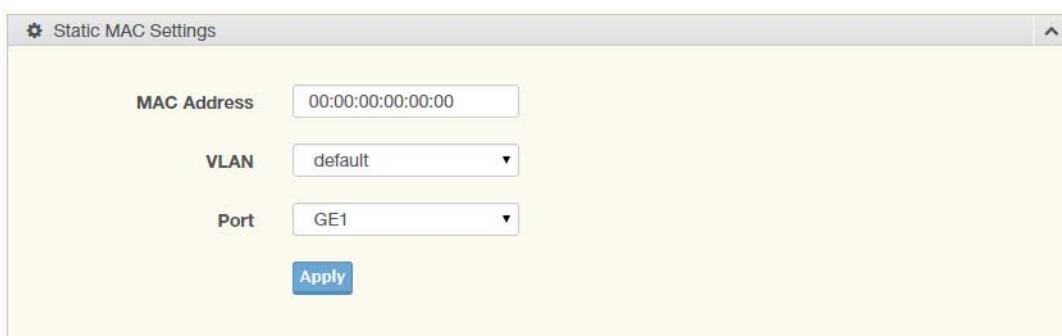
## 4.6 MAC Address Table

The MAC Address Table provides access to the Static MAC Settings, MAC Aging Time, and Dynamic Forwarding.

### 4.6.1 Static MAC

The Static MAC page allows you to configure the address for forwarding of packets, the VLAN ID of the listed MAC address and the designated Port.

To access this page, click **MAC Address Table > Static MAC**.



**Figure 4.56 MAC Address Table > Static MAC**

The following table describes the items in the previous figure.

| Item        | Description  |
|-------------|--|
| MAC Address | Enter the MAC address to which packets are statically forwarded.   |
| VLAN        | Click the drop-down menu to select the VLAN ID number of the VLAN for which the MAC address is residing. |
| Port        | Click the drop-down menu to select the port number.  |
| Apply       | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **Static MAC Status** settings are informational only: No., MAC Address, VLAN, Port and **Delete** (click to delete the desired MAC address).

### 4.6.2 MAC Aging Time

The MAC Aging Time page allows you to set the MAC address of the aging time to study.

To access this page, click **MAC Address Table > MAC Aging Time**.

The screenshot shows a window titled "Dynamic Address Settings". Inside, there is a label "Aging Time" followed by a text input field containing the number "300". To the right of the input field, it says "(Range: 10 - 630)". Below the input field is a blue button labeled "Apply".

**Figure 4.57 MAC Address Table > MAC Aging Time**

The following table describes the items in the previous figure.

| Item       | Description   |
|------------|---|
| Aging Time | Enter the variable (10 to 630) to define the time required for aging. |
| Apply      | Click <b>Apply</b> to save the values and update the screen.          |

The ensuing table for **Dynamic Address Status** settings are informational only: Aging time.

### 4.6.3 Dynamic Forwarding Table

The Dynamic Forwarding function allows you to configure an address tables, which contain the following:

- The port each hardware address is associated with
- The VLAN to show or clear dynamic MAC entries
- The MAC address selection

To access this page, click **MAC Address Table > Dynamic Forwarding Table**.

The screenshot shows a window titled "Dynamic Forwarding Table". It contains three rows of configuration options, each with a checkbox on the left and a corresponding field on the right:
 

- Port: GE1 (dropdown menu)
- VLAN: default (dropdown menu)
- MAC Address: 00:00:00:00:00:00 (text input field)

 At the bottom left, there are two blue buttons: "View" and "Clear".

**Figure 4.58 MAC Address Table > Dynamic Forwarding Table**

The following table describes the items in the previous figure.

| Item | Description  |
|------|--|
| Port | Click the drop-down menu to select the port number to show or clear dynamic MAC entries. If a port, VLAN or MAC address is not selected the whole dynamic MAC table is displayed or cleared. |
| VLAN | Click the drop-down menu to select the VLAN to show or clear dynamic MAC entries.  |

| Item        | Description   |
|-------------|---|
| MAC Address | Enter the MAC address to show or clear dynamic MAC entries. If a port, VLAN or MAC address is not selected the whole dynamic MAC table is displayed or cleared. |
| View        | Click <b>View</b> to display the MAC address information.   |
| Clear       | Click <b>Clear</b> to clear the MAC Address Information table.  |

The ensuing table for **MAC Address Information** settings are informational only: MAC Address, VLAN, Type, Port and **Add to Static MAC** (click to add the MAC address to static MAC address list).

## 4.7 Security

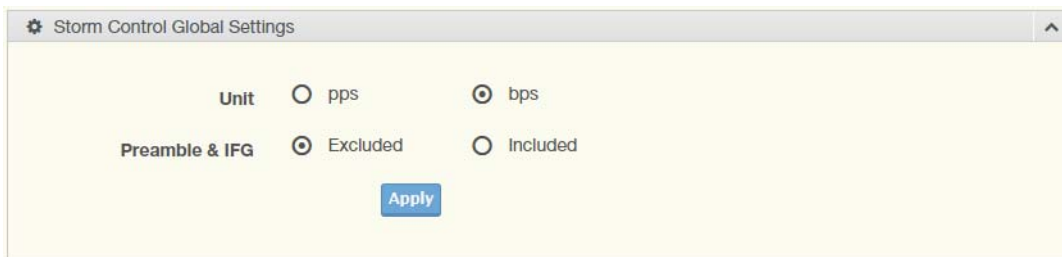
The Security function allows for the configuration of Storm Control, Port Security, Protected Ports, DoS Prevention, Applications, 802.1x, and IP Security.

### 4.7.1 Storm Control

The Storm Control page allows you to setup the units and Preamble/IFG to manage the occurrence of packet flooding on the LAN and consequent traffic to prevent the degrading of network performance.

#### 4.7.1.1 Global Settings

To access this page, click **Security > Storm Control > Global Settings**.



**Figure 4.59 Security > Storm Control > Global Settings**

The following table describes the items in the previous figure.

| Item           | Description  |
|----------------|--|
| Unit           | Select <b>pps</b> or <b>bps</b> control units for the Storm Control function.  |
| Preamble & IFG | Select <b>Excluded</b> or <b>Included</b> to setup the Storm Control Global settings. <ul style="list-style-type: none"> <li>■ Excluded: exclude preamble &amp; IFG (20 bytes) when count ingress storm control rate.</li> <li>■ Included: include preamble &amp; IFG (20 bytes) when count ingress storm control rate.</li> </ul> |
| Apply          | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **Storm Control Global Information** settings are informational only: Unit and Preamble & IFG.

#### 4.7.1.2 Port Settings

The Port Settings page allows you to configure the port and the type of storm control association along with the value of the storm rate for the selected port.

To access this page, click **Security > Storm Control > Port Settings**.

**Figure 4.60 Security > Storm Control > Port Settings**

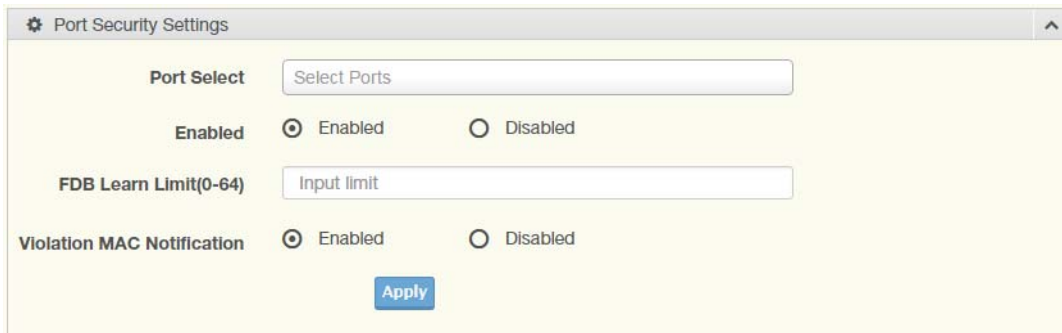
The following table describes the items in the previous figure.

| Item        | Description  |
|-------------|--|
| Port        | Enter the port number to designate the local port for the Storm Control function.  |
| Port State  | Select <b>Disabled</b> or <b>Enabled</b> to define the port state  |
| Action      | Click the drop-down menu to select the type of action to designate for the selected port during a Storm Control incident. The options are Drop and Shutdown.   |
| Type Enable | Click the radio button to enable Broadcast, Unknown Multicast, or Unknown Unicast. <ul style="list-style-type: none"> <li>■ Broadcast: Select the variable in Kbps to define the broadcast bandwidth.</li> <li>■ Unknown Multicast: Select the variable in Kbps to define the multicast setting.</li> <li>■ Unknown Unicast: Select the variable in Kbps to define the unknown unicast setting.</li> </ul> |
| Apply       | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **Storm Control Port Information** settings are informational only: Port, Port State, Broadcast (Kbps), Unknown Multicast (Kbps), Unknown Unicast (Kbps) and Action.

## 4.7.2 Port Security

The Port Security page allows you to configure port isolation behavior. To access this page, click **Security > Port Security**.



**Figure 4.61 Security > Port Security**

The following table describes the items in the previous figure.

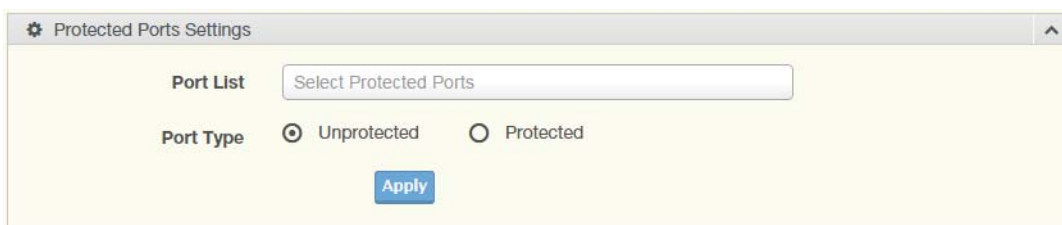
| Item                       | Description  |
|----------------------------|--|
| Port Select                | Enter a single or multiple port numbers to configure.                    |
| Enabled                    | Select <b>Enabled</b> or <b>Disabled</b> to define the selected Port.    |
| FDB Learn Limit (0-64)     | Enter the variable (0 to 64) to set the learn limit for the FDB setting. |
| Violation MAC Notification | Select <b>Enabled</b> or <b>Disabled</b> to define the selected Port.    |
| Apply                      | Click <b>Apply</b> to save the values and update the screen.             |

The ensuing table for **Port Security Information** settings are informational only: Port, Enabled, FDB Learn Limit and Violation MAC Notification.

## 4.7.3 Protected Ports

The Protected Port page allows you to configure a single or multiple ports as a protected or unprotected type.

To access this page, click **Security > Protected Ports**.



**Figure 4.62 Security > Protected Ports**

The following table describes the items in the previous figure.

| Item      | Description  |
|-----------|--|
| Port List | Enter the port number to designate for the Protected Port setting.     |
| Port Type | Select <b>Unprotected</b> or <b>Protected</b> to define the port type. |
| Apply     | Click <b>Apply</b> to save the values and update the screen.           |

The ensuing table for **Protected Ports Status** settings are informational only: Protected Ports and Unprotected Ports.

## 4.7.4 DoS Prevention

The DoS Prevention page allows you to setup (enabled or disabled) the denial of service.

### 4.7.4.1 DoS Global Settings

The DoS Global Settings page allows you to configure (enabled or disabled) the setting for each function.

To access this page, click **Security > DoS Prevention > DoS Global Settings**.

|                           |  |                                |
|---------------------------|--|--------------------------------|
| DMAC = SMAC               | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| LAND                      | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| UDP Blat                  | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| TCP Blat                  | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| POD                       | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| IPv6 Min Fragment         | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
|                           | Bytes 1240                               | (0-65535)                      |
| ICMP Fragments            | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| IPv4 Ping Max Size        | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| IPv6 Ping Max Size        | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| Ping Max Size Setting     | Bytes 512                                | (0-65535)                      |
| Smurf Attack              | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
|                           | Netmask Length 0                         | (0-32)                         |
| TCP Min Hdr Size          | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
|                           | Byte 20                                  | (0-31)                         |
| TCP-SYN(SPORT<1024)       | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| Null Scan Attack          | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| X-Mas Scan Attack         | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| TCP SYN-FIN Attack        | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| TCP SYN-RST Attack        | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |
| TCP Fragment (Offset = 1) | <input checked="" type="radio"/> Enabled | <input type="radio"/> Disabled |

Apply

**Figure 4.63 Security > DoS Prevention > DoS Global Settings**

The following table describes the items in the previous figure.

| Item        | Description  |
|-------------|--|
| DMAC = SMAC | Click <b>Enabled</b> or <b>Disabled</b> to define DMAC-SMAC for the DoS Global settings. |
| LAND        | Click <b>Enabled</b> or <b>Disabled</b> to define LAND for the DoS Global settings.      |



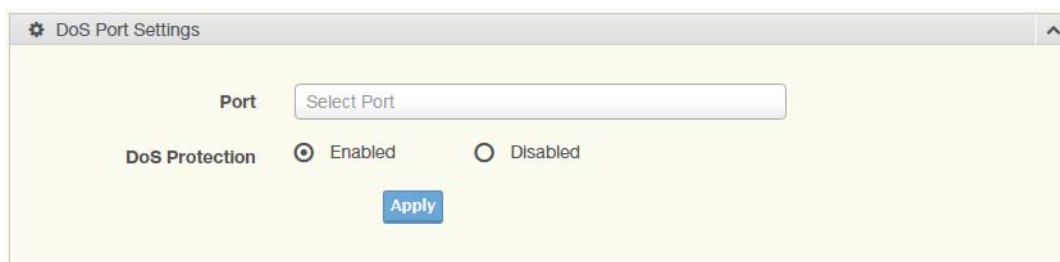
| Item                      | Description   |
|---------------------------|---|
| UDP Blat                  | Click <b>Enabled</b> or <b>Disabled</b> to define UDP Blat for the DoS Global settings.   |
| TCP Blat                  | Click <b>Enabled</b> or <b>Disabled</b> to define TCP Blat for the DoS Global settings.   |
| POD                       | Click <b>Enabled</b> or <b>Disabled</b> to define POD for the DoS Global settings.  |
| IPv6 Min Fragment         | Click <b>Enabled</b> or <b>Disabled</b> to define minimum fragment size for the IPv6 protocol.<br>Enter the variable in bytes (0 to 65535) to set the minimum fragment size when the function is enabled. |
| ICMP Fragments            | Click <b>Enabled</b> or <b>Disabled</b> to define the ICMP Fragments function.  |
| IPv4 Ping Max Size        | Click <b>Enabled</b> or <b>Disabled</b> to set the maximum ping size for the IPv4 protocol.   |
| IPv6 Ping Max Size        | Click <b>Enabled</b> or <b>Disabled</b> to set a maximum ping size for the IPv6 protocol.   |
| Ping Max Size Setting     | Enter the variable in bytes (0 to 65535) to set the maximum ping size.  |
| Smurf Attack              | Click <b>Enabled</b> or <b>Disabled</b> to set the Smurf Attack function.   |
| TCP Min Hdr Size          | Click <b>Enabled</b> or <b>Disabled</b> to set the minimum header size.<br>Enter the variable in bytes (0 to 31) to set the minimum header size.  |
| TCP-SYN (SPORT < 1024)    | Click <b>Enabled</b> or <b>Disabled</b> to set the TCP synchronization function (sport < 1021).   |
| Null Scan Attack          | Click <b>Enabled</b> or <b>Disabled</b> to set the Null Scan Attack function.   |
| X-Mas Scan Attack         | Click <b>Enabled</b> or <b>Disabled</b> to set the X-Mas Scan function.   |
| TCP SYN-FIN Attack        | Click <b>Enabled</b> or <b>Disabled</b> to set the TCP synchronization termination attack function.   |
| TCP SYN-RST Attack        | Click <b>Enabled</b> or <b>Disabled</b> to set the TCP synchronization reset attack function.   |
| TCP Fragment (Offset = 1) | Click <b>Enabled</b> or <b>Disabled</b> to set the TCP fragment function (offset =1).   |
| Apply                     | Click <b>Apply</b> to save the values and update the screen.  |

The ensuing table for **DoS Global Information** settings are informational only: DMAC = SMAC, Land Attack, UDP Blat, TCP Blat, POD (Ping of Death), IPv6 Min Fragment Size, ICMP Fragment Packets, IPv4 Ping Max Packet Size, IPv6 Ping Max Packet Size, Smurf Attack, TCP Min Header Length, TCP Syn (SPORT < 1024), Null Scan Attack, X-Mas Scan Attack, TCP SYN-FIN Attack, TCP SYN-RST Attack and TCP Fragment (Offset = 1).

#### 4.7.4.2 DoS Port Settings

The DoS Port Settings page allow you to configure DoS security (enabled or disabled) for the selected port.

To access this page, click **Security > DoS Prevention > DoS Port Settings**.



**Figure 4.64 Security > DoS Prevention > DoS Port Settings**

The following table describes the items in the previous figure.

| Item           | Description  |
|----------------|--|
| Port           | Select the port to configure for the DoS prevention function.                        |
| DoS Protection | Click <b>Enabled</b> or <b>Disabled</b> to set the DoS Port security function state. |
| Apply          | Click <b>Apply</b> to save the values and update the screen.                         |

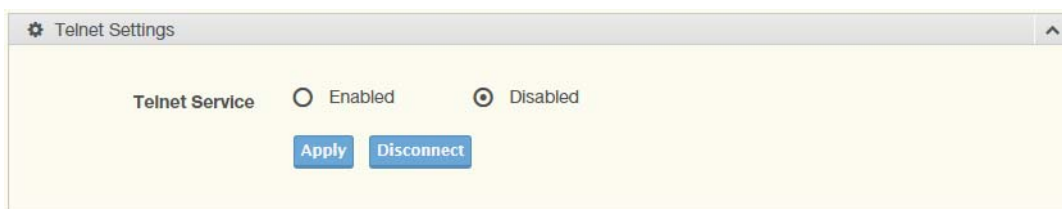
The ensuing table for **DoS Port Status** settings are informational only: Port and DoS Protection.

## 4.7.5 Applications

The Applications function allows you to configure various types of AAA lists.

### 4.7.5.1 TELNET

The TELNET page allows you to combine all kinds of AAA lists with the Telnet line. To access this page, click **Security > Applications > TELNET**.



**Figure 4.65 Security > Applications > TELNET**

The following table describes the items in the previous figure.

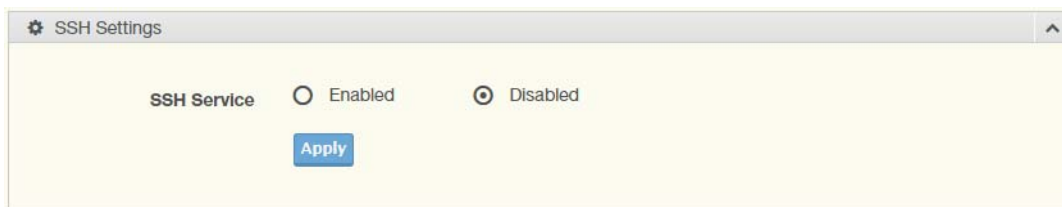
| Item           | Description   |
|----------------|---|
| Telnet Service | Click <b>Enabled</b> or <b>Disabled</b> to set remote access through the Telnet Service function. |
| Apply          | Click <b>Apply</b> to save the values and update the screen.                                      |
| Disconnect     | Click <b>Disconnect</b> to disable the current Telnet service.                                    |

The ensuing table for **Telnet Information** settings are informational only: Telnet Service and Current Telnet Sessions Count.

### 4.7.5.2 SSH

Secure Shell (SSH) is a protocol providing secure (encrypted) management connection to a remote device.

To access this page, click **Security > Applications > SSH**.



**Figure 4.66 Security > Applications > SSH**

The following table describes the items in the previous figure.

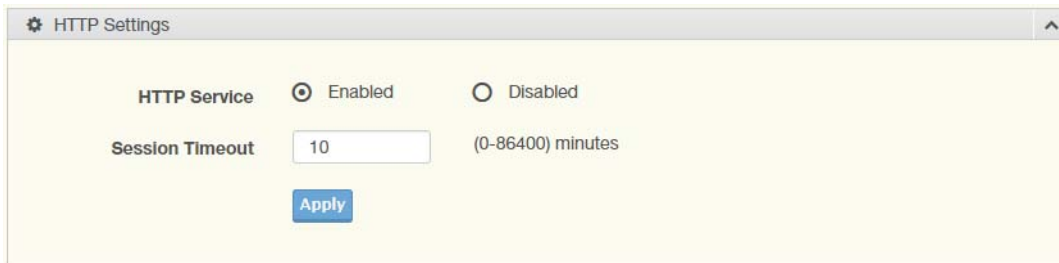
| Item        | Description   |
|-------------|---|
| SSH Service | Click <b>Enabled</b> or <b>Disabled</b> to set up Ethernet encapsulation (remote access) through the Secure Shell (SSH) function. |
| Apply       | Click <b>Apply</b> to save the values and update the screen.  |

The ensuing table for **SSH Information** settings are informational only: SSH.

#### 4.7.5.3 HTTP

The HTTP page allows you to combine all kinds of AAA lists to the HTTP line. Attempts to access the switch's Web UI from HTTP are first authenticated.

To access this page, click **Security > Applications > HTTP**.



**Figure 4.67 Security > Applications > HTTP**

The following table describes the items in the previous figure.

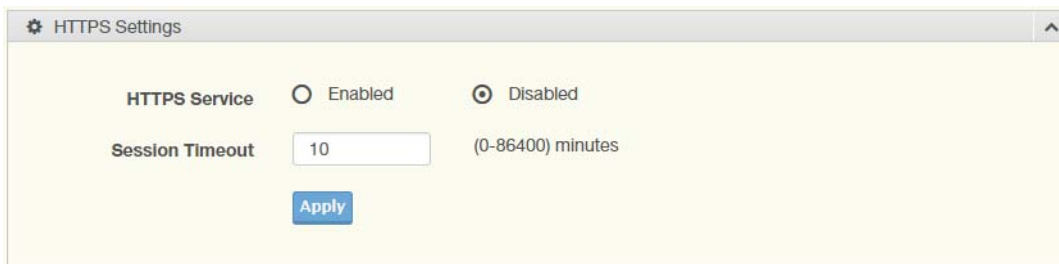
| Item            | Description   |
|-----------------|---|
| HTTP Service    | Click <b>Enabled</b> or <b>Disabled</b> to set up Ethernet encapsulation (remote access) through HTTP function. |
| Session Timeout | Enter the variable in minutes (0 to 86400) to define the timeout period for the HTTP session.                   |
| Apply           | Click <b>Apply</b> to save the values and update the screen.  |

The ensuing table for **HTTP Information** settings are informational only: HTTP Service and Session Timeout.

#### 4.7.5.4 HTTPS

The HTTPS page allows you to combine all kinds of AAA lists on the HTTPS line. Attempts to access the switch's Web UI from HTTPS are first authenticated.

To access this page, click **Security > Applications > HTTPS**.



**Figure 4.68 Security > Applications > HTTPS**

The following table describes the items in the previous figure.

| Item            | Description  |
|-----------------|--|
| HTTPS Service   | Click <b>Enabled</b> or <b>Disabled</b> to set up Ethernet encapsulation over HTTPS.           |
| Session Timeout | Enter the variable in minutes (0 to 86400) to define the timeout period for the HTTPS session. |
| Apply           | Click <b>Apply</b> to save the values and update the screen.                                   |

The ensuing table for **HTTPS Information** settings are informational only: HTTPS Service and Session Timeout.

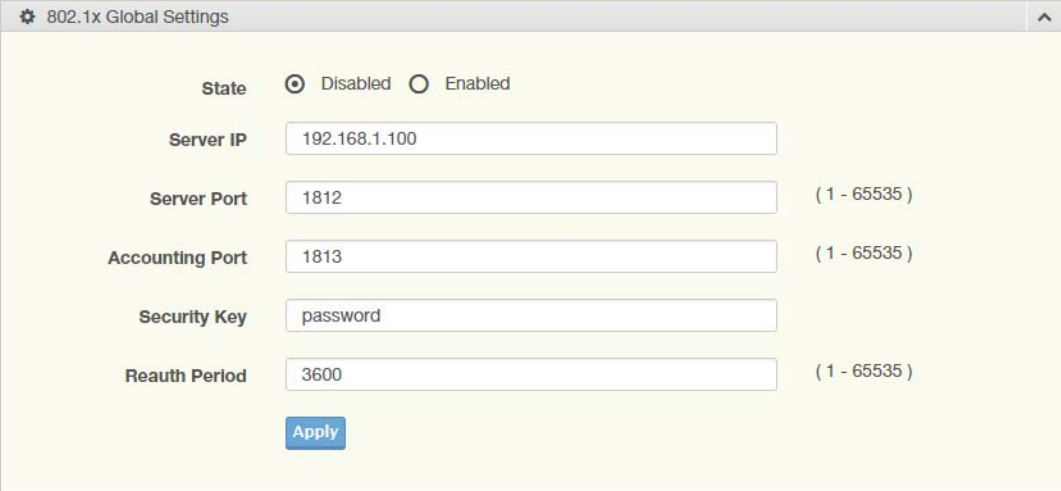
## 4.7.6 802.1x

The 802.1x function provides port-based authentication to prevent unauthorized devices (clients) from gaining access to the network.

### 4.7.6.1 802.1x Global Settings

The 802.1x Global Settings page allows you to set the state (enabled or disabled) for the selected IP server address, port, accounting port and associated password, including a reauthentication period.

To access this page, click **Security > 802.1x > 802.1x Global Settings**.



**Figure 4.69 Security > 802.1x > 802.1x Global Settings**

The following table describes the items in the previous figure.

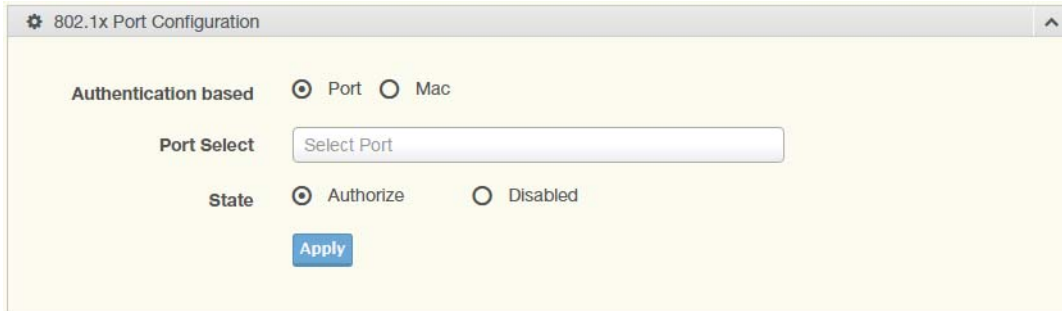
| Item            | Description  |
|-----------------|--|
| State           | Click <b>Enabled</b> or <b>Disabled</b> to set up 802.1x Setting function.   |
| Server IP       | Enter the IP address of the local server providing authentication function.  |
| Server Port     | Enter the port number (1 to 65535) assigned to the listed Server IP.   |
| Accounting Port | Enter the port number (1 to 65535) assigned to the listed server IP configured to provide authorization and authentication for network access. |
| Security Key    | Enter the variable to define the network security key used in authentication.  |
| Reauth Period   | Enter the variable in seconds to define the period of time between authentication attempts.  |
| Apply           | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **802.1x Information** settings are informational only: 802.1x State, Server IP, Server Port, Accounting Port, Security Key and Reauth Period.

#### 4.7.6.2 802.1x Port Configuration

The 802.1x Port Configuration page allows you to identify the authorization state for a port by using a MAC or Port authentication base.

To access this page, click **Security > 802.1x > 802.1x Port Configuration**.



**Figure 4.70 Security > 802.1x > 802.1x Port Configuration**

The following table describes the items in the previous figure.

| Item                 | Description   |
|----------------------|---|
| Authentication based | Click <b>Port</b> or <b>Mac</b> to designate the type of configuration for the 802.1x Port setting. |
| Port Select          | Enter the port number associated with the configuration setting.                                    |
| State                | Click <b>Authorize</b> or <b>Disabled</b> to define the listed port's state mode.                   |
| Apply                | Click <b>Apply</b> to save the values and update the screen.  |

The ensuing table for **802.1x Port Authorization** settings are informational only: Port and Port State.

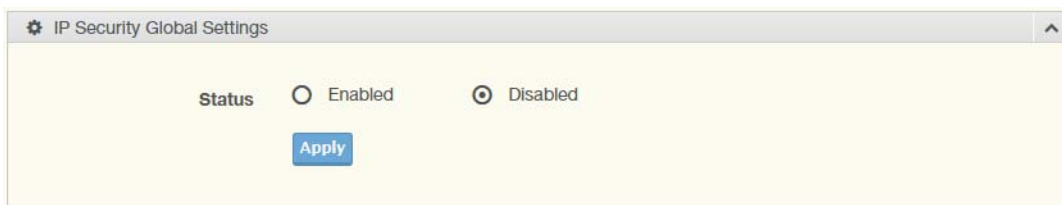
#### 4.7.7 IP Security

This section provides you a means to configure the IP Security settings.

##### 4.7.7.1 Global Settings

The Global Settings page allows you to set the IP Security status (enabled or disabled).

To access this page, click **Security > IP Security > Global Settings**.



**Figure 4.71 Security > IP Security > Global Settings**

The following table describes the items in the previous figure.

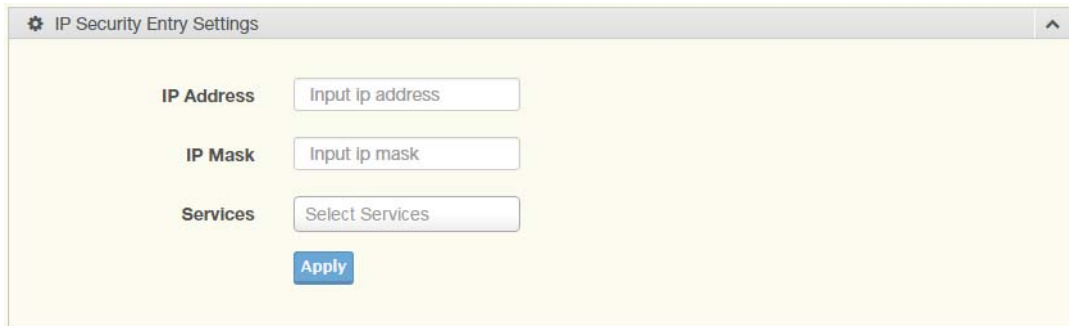
| Item   | Description  |
|--------|--|
| Status | Click <b>Enabled</b> or <b>Disabled</b> to define the global setting for the IP security function. |
| Apply  | Click <b>Apply</b> to save the values and update the screen.                                       |

The ensuing table for **IP Security Status** settings are informational only: IP Security.

### 4.7.7.2 Entry Settings

Once the Global Setting is enabled, use the Entry Settings to define an IP Security entry.

To access this page, click **Security > IP Security > Entry Settings**.



**Figure 4.72 Security > IP Security > Entry Settings**

The following table describes the items in the previous figure.

| Item       | Description  |
|------------|--|
| IP Address | Enter the source IP address to apply the IP Security function.   |
| IP Mask    | Enter the IP address for use in masking the previous IP Address. |
| Services   | Enter the type of services to associate with the entry setting.  |
| Apply      | Click <b>Apply</b> to save the values and update the screen.     |

The ensuing table for **IP Security Entry Information** settings are informational only: IP Address, IP Mask, Services and Action.

## 4.8 QoS

The QoS function allows you to configure settings for the switch QoS interface and how the switch connects to a remote server to get services.

### 4.8.1 General

Traditionally, networks operate on a best-effort delivery basis, all traffic has equal priority and an equal chance of being delivered in a timely manner. When there is congestion, all traffic has an equal chance of being dropped.

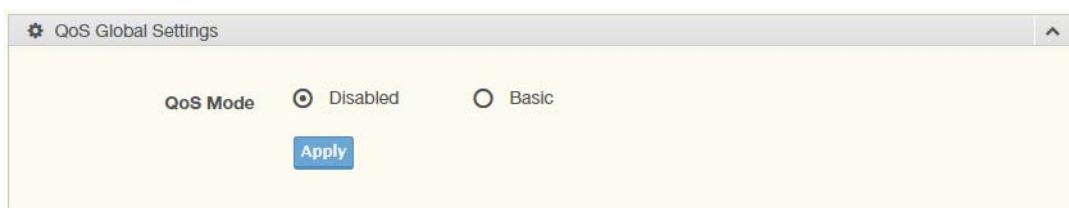
The QoS feature can be configured for congestion-management and congestion-avoidance to specifically manage the priority of the traffic delivery. Implementing QoS in the network makes performance predictable and bandwidth utilization much more effective.

The QoS implementation is based on the prioritization values in Layer 2 frames.

#### 4.8.1.1 QoS Properties

The QoS Properties allows you to set the QoS mode.

To access this page, click **QoS > General > QoS Properties**.



**Figure 4.73 QoS > General > QoS Properties**

The following table describes the items in the previous figure.

| Item     | Description   |
|----------|---|
| QoS Mode | Select <b>Disabled</b> or <b>Basic</b> to setup the QoS function. |
| Apply    | Click <b>Apply</b> to save the values and update the screen.      |

The ensuing table for **QoS Global Information** settings are informational only: QoS Mode.

#### 4.8.1.2 QoS Settings

Once the QoS function is enabled, you can configure the available settings.

To access this page, click **QoS > General > QoS Settings**.

**Figure 4.74 QoS > General > QoS Settings**

The following table describes the items in the previous figure.

| Item                 | Description   |
|----------------------|---|
| Port                 | Enter the port number to associate with the QoS setting.  |
| CoS Value            | Click the drop-down menu to designate the Class of Service (CoS) value (0 to 7) for the Port entry.   |
| Remark CoS           | Click <b>Disabled</b> or <b>Enabled</b> to setup the Remark CoS function. When enabled the LAN (preassigned priority values) is marked at Layer 2 boundary to CoS values. |
| Remark DSCP          | Click <b>Disabled</b> or <b>Enabled</b> to setup the DSCP remark option for the QoS function.   |
| Remark IP Precedence | Click <b>Disabled</b> or <b>Enabled</b> to setup the Remark IP Precedence for the QoS function.   |
| Apply                | Click <b>Apply</b> to save the values and update the screen.  |

The ensuing table for **QoS Status** settings are informational only: Port, CoS value, Remark CoS, Remark DSCP and Remark IP Precedence.

#### 4.8.1.3 Queue Scheduling

The switch support eight CoS queues for each egress port. For each of the eight queues, two types of scheduling can be configured: Strict Priority and Weighted Round Robin (WRR).

Strict Priority scheduling is based on the priority of queues. Packets in a high-priority queue are always sent first and packets in a low-priority queue are only sent after all the high priority queues are empty.

Weighted RoundRobin (WRR) scheduling is based on the user priority specification to indicate the importance (weight) of the queue relative to the other CoS queues. WRR scheduling prevents low-priority queues from being completely ignored during

periods of high priority traffic. The WRR scheduler sends some packets from each queue in turn.

To access this page, click **QoS > General > QoS Scheduling**.

| Queue | Strict                           | WRR                   | Weight | % of WRR Bandwidth |
|-------|----------------------------------|-----------------------|--------|--------------------|
| 1     | <input checked="" type="radio"/> | <input type="radio"/> | 1      |                    |
| 2     | <input checked="" type="radio"/> | <input type="radio"/> | 2      |                    |
| 3     | <input checked="" type="radio"/> | <input type="radio"/> | 3      |                    |
| 4     | <input checked="" type="radio"/> | <input type="radio"/> | 4      |                    |
| 5     | <input checked="" type="radio"/> | <input type="radio"/> | 5      |                    |
| 6     | <input checked="" type="radio"/> | <input type="radio"/> | 9      |                    |
| 7     | <input checked="" type="radio"/> | <input type="radio"/> | 13     |                    |
| 8     | <input checked="" type="radio"/> | <input type="radio"/> | 15     |                    |

[Apply](#)

**Figure 4.75 QoS > General > QoS Scheduling**

The following table describes the items in the previous figure.

| Item               | Description   |
|--------------------|---|
| Queue              | Queue entry for egress port.  |
| Strict             | Select Strict to assign the scheduling designation to the selected queue.   |
| WRR                | Select WRR to assign the scheduling designation to the selected queue.      |
| Weight             | Enter a queue priority (weight) relative to the defined entries (WRR only). |
| % of WRR Bandwidth | Displays the allotted bandwidth for the queue entry in percentage values.   |
| Apply              | Click <b>Apply</b> to save the values and update the screen.                |

The ensuing table for **Queue Information** settings are informational only: Strict Priority Queue Number.



#### 4.8.1.4 CoS Mapping

The CoS Mapping allows you to apply CoS mapping.

To access this page, click **QoS > General > CoS Mapping**.

**Figure 4.76 QoS > General > CoS Mapping**

The following table describes the items in the previous figure.

| Item                 | Description  |
|----------------------|--|
| CoS to Queue Mapping |  |
| Class of Service     | Displays the CoS for the queue entry.                                  |
| Queue                | Click the drop-down menu to select the queue priority for selected CoS |
| Queue to CoS Mapping |  |
| Queue                | Displays the queue entry for CoS mapping.                              |
| Class of Service     | Click the drop-down menu to select the CoS type                        |
| Apply                | Click <b>Apply</b> to save the values and update the screen.           |

The ensuing table for **CoS Mapping Information** settings are informational only: CoS and Mapping to Queue.

The ensuing table for **Queue Mapping Information** settings are informational only: Queue and Mapping to CoS.

#### 4.8.1.5 DSCP Mapping

The DSCP to Queue mapping function maps queue values in incoming packets to a DSCP value that QoS uses internally to represent the priority of the traffic. The following table shows the DSCP to Queue map.

If these values are not appropriate for your network, you need to modify them.

To access this page, click **QoS > General > DSCP Mapping**.

**Figure 4.77 QoS > General > DSCP Mapping**

The following table describes the items in the previous figure.

| Item                         | Description  |
|------------------------------|--|
| <b>DSCP to Queue Mapping</b> |  |
| DSCP                         | Enter the DSCP entry to define the precedence values.                        |
| Queue                        | Click the drop-down menu to select the queue designation for the DSCP value. |
| <b>Queue to DSCP Mapping</b> |  |
| Queue                        | Displays the queue value for the DSCP map.                                   |
| DSCP                         | Enter the DSCP entry to define the precedence values.                        |
| Apply                        | Click <b>Apply</b> to save the values and update the screen.                 |

The ensuing table for **DSCP Mapping Information** settings are informational only: DSCP and Mapping to Queue.

The ensuing table for **Queue Mapping Information** settings are informational only: Queue and Mapping to DSCP.

#### 4.8.1.6 IP Precedence Mapping

The IP Precedence Mapping allows you to set IP Precedence mapping.

To access this page, click **QoS > General > IP Precedence Mapping**.

The screenshot shows a configuration window titled "IP Precedence Mapping". It is divided into two main sections:

- IP Precedence to Queue Mapping:** This section contains two columns. The left column lists IP Precedence values from 0 to 7, each with a corresponding Queue value in a dropdown menu (1 to 7). The right column lists IP Precedence values from 1 to 8, each with a corresponding Queue value in a dropdown menu (2 to 8).
- Queue to IP Precedence Mapping:** This section contains two columns. The left column lists Queue values from 1 to 7, each with a corresponding IP Precedence value in a dropdown menu (0 to 6). The right column lists Queue values from 2 to 8, each with a corresponding IP Precedence value in a dropdown menu (1 to 7).

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

**Figure 4.78 QoS > General > IP Precedence Mapping**

The following table describes the items in the previous figure.

| Item                                  | Description   |
|---------------------------------------|---|
| <b>IP Precedence to Queue Mapping</b> |   |
| IP Precedence                         | Displays the IP precedence value for the queue map.                           |
| Queue                                 | Click the drop-down menu to map a queue value to the selected IP precedence.  |
| <b>Queue to IP Precedence Mapping</b> |   |
| Queue                                 | Displays the queue entry for mapping IP precedence values.                    |
| IP Precedence                         | Click the drop-down menu to map an IP precedence value to the selected queue. |
| Apply                                 | Click <b>Apply</b> to save the values and update the screen.                  |

The ensuing table for **IP Precedence Mapping Information** settings are informational only: IP Precedence and Mapping to Queue.

The ensuing table for **Queue Mapping Information** settings are informational only: Queue and Mapping to IP Precedence.

## 4.8.2 QoS Basic Mode

Quality of Service (QoS) allows to give preferential treatment to certain types of traffic at the expense of others. Without QoS, the switch offers best-effort service to each packet, regardless of the packet contents or size sending the packets without any assurance of reliability, delay bounds, or throughput.

QoS mode supports two modes: 802.1p and DSCP.

### 4.8.2.1 Global Settings

The Global Settings page allows you to configure the trust mode to a port selection.

To access this page, click **QoS > QoS Basic Mode > Global Settings**.

The function is only available when **QoS Properties** is set to **Basic**.



**Figure 4.79 QoS > QoS Basic Mode > Global Settings**

The following table describes the items in the previous figure.

| Item       | Description   |
|------------|---|
| Trust Mode | Click the drop-down menu to select the trust state of the QoS basic mode. |
| Apply      | Click <b>Apply</b> to save the values and update the screen.              |

The ensuing table for **QoS Information** settings are informational only: Trust Mode.

### 4.8.2.2 Port Settings

The Port Settings page allows you to define a trust state (enabled or disabled) to a listed port.

To access this page, click **QoS > QoS Basic Mode > Port Settings**.



**Figure 4.80 QoS > QoS Basic Mode > Port Settings**

The following table describes the items in the previous figure.

| Item        | Description  |
|-------------|--|
| Port        | Enter the port number for the QoS basic mode setting.                          |
| Trust State | Select <b>Enabled</b> or <b>Disabled</b> to set the port's trust state status. |
| Apply       | Click <b>Apply</b> to save the values and update the screen.                   |

The ensuing table for **QoS Port Status** settings are informational only: Port and Trust State.

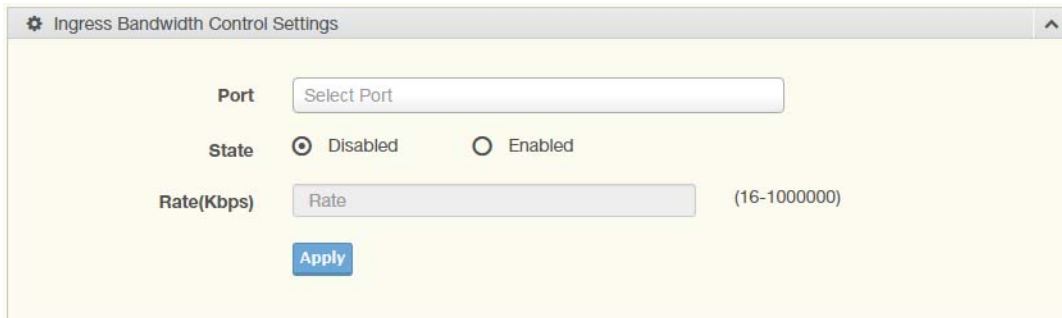
### 4.8.3 Rate Limit

Rate Limits features control on a per port basis. Bandwidth control is supported for the following: Ingress Bandwidth Control, Egress Bandwidth Control and Egress Queue.

#### 4.8.3.1 Ingress Bandwidth Control

The Ingress Bandwidth Control page allows you to configure the bandwidth control for a listed port.

To access this page, click **QoS > Rate Limit > Ingress Bandwidth Control**.



**Figure 4.81 QoS > Rate Limit > Ingress Bandwidth Control**

The following table describes the items in the previous figure.

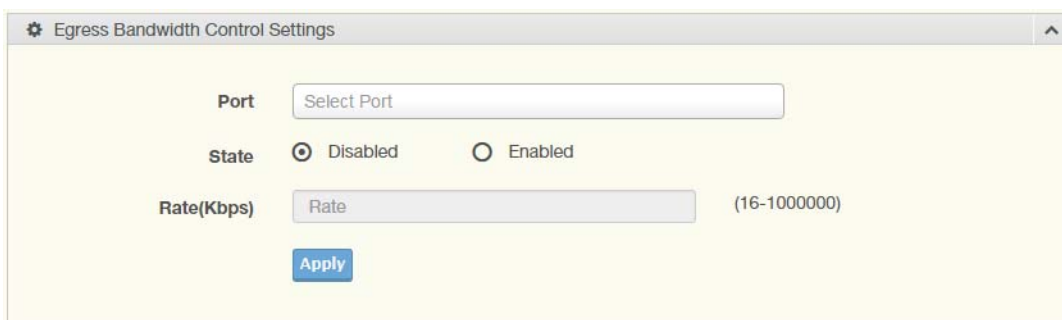
| Item        | Description   |
|-------------|---|
| Port        | Enter the port number for the rate limit setup.   |
| State       | Select <b>Disabled</b> or <b>Enabled</b> to set the port's state status.                    |
| Rate (Kbps) | Enter the value in Kbps (16 to 1000000) to set as the bandwidth rate for the selected port. |
| Apply       | Click <b>Apply</b> to save the values and update the screen.                                |

The ensuing table for **Ingress Bandwidth Control Status** settings are informational only: Port and Ingress Rate Limit (Kbps).

#### 4.8.3.2 Egress Bandwidth Control

The Egress Bandwidth Control page allows you to set the egress bandwidth control for a listed port.

To access this page, click **QoS > Rate Limit > Egress Bandwidth Control**.



**Figure 4.82 QoS > Rate Limit > Egress Bandwidth Control**

The following table describes the items in the previous figure.

| Item | Description  |
|------|--|
| Port | Enter the port number to set the Egress Bandwidth Control. |

| Item        | Description   |
|-------------|---|
| State       | Select <b>Disabled</b> or <b>Enabled</b> to set the Egress Bandwidth Control state. |
| Rate (Kbps) | Enter the value in Kbps (16 to 1000000) to set the Egress Bandwidth rate.           |
| Apply       | Click <b>Apply</b> to save the values and update the screen.                        |

The ensuing table for **Egress Bandwidth Control Status** settings are informational only: Port and Egress Rate Limit (Kbps).

#### 4.8.3.3 Egress Queue

The Egress Queue page allows you to set the egress bandwidth parameters.

To access this page, click **QoS > Rate Limit > Egress Queue**.

**Figure 4.83 QoS > Rate Limit > Egress Queue**

The following table describes the items in the previous figure.

| Item       | Description   |
|------------|---|
| Port       | Click the drop-down menu to select the port to define the Egress queue.           |
| Queue      | Click the drop-down menu to set the queue order for the Egress setting.           |
| State      | Click <b>Disabled</b> or <b>Enabled</b> to set the Egress queue state.            |
| CIR (Kbps) | Enter the value in Kbps (16 to 1000000) to set the CIR rate for the Egress queue. |
| Apply      | Click <b>Apply</b> to save the values and update the screen.                      |

The ensuing table for **FE1 Egress Per Queue Status** settings are informational only: Queue Id and Egress Rate Limit (Kbps).

## 4.9 Management

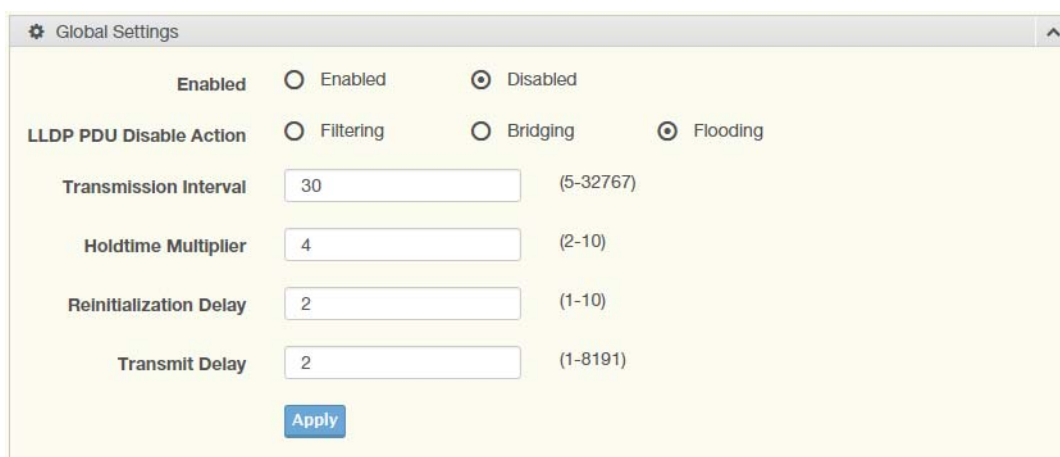
### 4.9.1 LLDP

LLDP is a one-way protocol without request/response sequences. Information is advertised by stations implementing the transmit function, and is received and processed by stations implementing the receive function.

#### 4.9.1.1 LLDP System Settings

The LLDP System Settings allows you to configure the status (enabled or disabled) for the protocol, set the interval for frame transmission, set the hold time multiplier and the re-initialization delay.

To access this page, click **Management > LLDP > LLDP System Settings**.



**Figure 4.84 Management > LLDP > LLDP System Settings**

The following table describes the items in the previous figure.

| Item                    | Description  |
|-------------------------|--|
| Enabled                 | Click <b>Enabled</b> or <b>Disabled</b> to set the Global Settings state.  |
| LLDP PDU Disable Action | Click to select the LLDP PDU handling action when LLDP is globally disabled. Options include: Filtered, Bridged, or Flooded. |
| Transmission Interval   | Select the interval at which frames are transmitted. The default is 30 seconds, and the valid range is 5 to 32768 seconds.   |
| Holdtime Multiplier     | Select the multiplier on the transmit interval to assign to TTL.   |
| Reinitialization Delay  | Select the delay length before re-initialization.  |
| Transmit Delay          | Select the delay after an LLDP frame is sent.  |
| Apply                   | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **LLDP Global Config** settings are informational only: LLDP Enabled, LLDP PDU Disable Action, Transmission Interval, Holdtime Multiplier, Reinitialization Delay and Transmit Delay.

### 4.9.1.2 LLDP Port Settings

The LLDP Port Settings page allows you to configure the state (enabled or disabled) of the selected port.

To access this page, click **Management > LLDP > LLDP Port Settings**.

**Figure 4.85 Management > LLDP > LLDP Port Settings > LLDP Port Configuration**

The following table describes the items in the previous figure.

| Item        | Description  |
|-------------|--|
| Port Select | Enter the port number associated with the LLDP setting.      |
| State       | Click the drop-down menu to select the LLDP port state.      |
| Apply       | Click <b>Apply</b> to save the values and update the screen. |

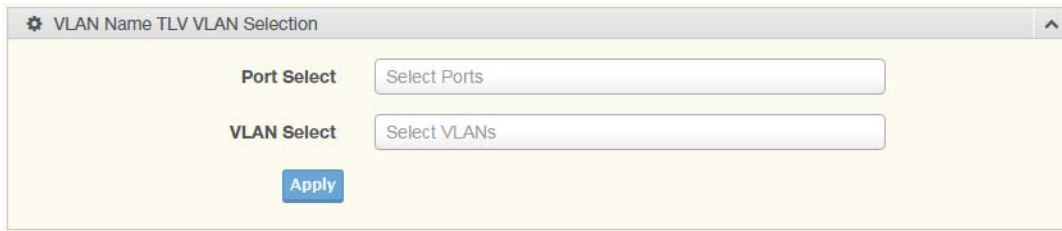
**Figure 4.86 Management > LLDP > LLDP Port Settings > Optional TLVs Selection**

The following table describes the items in the previous figure.

| Item                | Description   |
|---------------------|---|
| Port Select         | Enter the port number associated with the TLV (optional) selection.   |
| Optional TLV Select | Click the drop-down menu to select the LLDP optional TLVs to be carried (multiple selections are allowed). <ul style="list-style-type: none"> <li>■ System Name: To include system name TLV in LLDP frames.</li> <li>■ Port Description: To include port description TLV in LLDP frames.</li> <li>■ System Description: To include system description TLV in LLDP frames.</li> <li>■ System Capability: To include system capability TLV in LLDP frames.</li> <li>■ 802.3 MAC-PHY:</li> <li>■ 802.3 Link Aggregation:</li> <li>■ 802.3 Maximum Frame Size:</li> <li>■ Management Address:</li> <li>■ 802.1 PVID:</li> </ul> |
| Apply               | Click <b>Apply</b> to save the values and update the screen.  |

The ensuing table for **LLDP Port Status** settings are informational only: Port, State and Selected Optional TLVs.





**Figure 4.87 Management > LLDP > LLDP Port Settings > VLAN Name TLV VLAN Selection**

The following table describes the items in the previous figure.

| Item        | Description  |
|-------------|--|
| Port Select | Enter the port number to associated with the TLV selection.                |
| VLAN Select | Select the VLAN Name ID to be carried out (multiple selection is allowed). |
| Apply       | Click <b>Apply</b> to save the values and update the screen.               |

The ensuing table for **LLDP Port VLAN TLV Status** settings are informational only: Port and Selected VLAN.

#### 4.9.1.3 LLDP Local Device Info

The LLDP Local Device Info page allows you to view information regarding network devices, providing that the switch has already obtained LLDP information on the devices.

To access this page, click **Management > LLDP > LLDP Local Device Info**.

The ensuing table for **Local Device Summary** settings are informational only: Chassis ID Subtype, Chassis ID, System Name, System Description, Capabilities Supported, Capabilities Enabled and Port ID Subtype.

The ensuing table for **Port Status** settings are informational only: Port, Selected VLAN and **Detail** (click the radio box and click **Detail** to displays the details).

#### 4.9.1.4 LLDP Remote Device Info

The LLDP Remote Device Info page allows you to view information about remote devices, LLDP information must be available on the switch.

To access this page, click **Management > LLDP > LLDP Remote Device Info**.



**Figure 4.88 Management > LLDP > LLDP Remote Device Info**

The following table describes the items in the previous figure.

| Item    | Description  |
|---------|--|
| Detail  | Click to display the device details.                 |
| Delete  | Click to delete the selected devices.                |
| Refresh | Click to refresh the remote device information list. |

#### 4.9.1.5 LLDP Overloading

To access this page, click **Management > LLDP > LLDP Overloading**.

The ensuing table for **LLDP Overloading** settings are informational only: Port, Total (Bytes), Left to Send (Bytes), Status and Status (Mandatory TLVs, 802.3 TLVs, Optional TLVs and 802.1 TLVs).

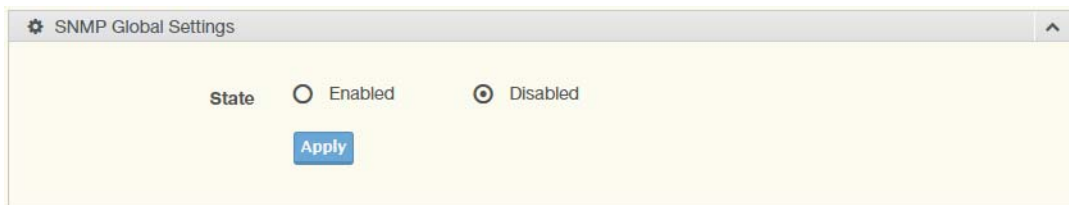
### 4.9.2 SNMP

Simple Network Management Protocol (SNMP) is a protocol to facilitate the monitoring and exchange of management information between network devices. Through SNMP, the health of the network or status of a particular device can be determined.

#### 4.9.2.1 SNMP Settings

The SNMP Settings page allows you to set the SNMP daemon state (enabled or disabled).

To access this page, click **Management > SNMP > SNMP Settings**.



**Figure 4.89 Management > SNMP > SNMP Settings**

The following table describes the items in the previous figure.

| Item  | Description  |
|-------|--|
| State | Click <b>Enabled</b> or <b>Disabled</b> to define the SNMP daemon. |
| Apply | Click <b>Apply</b> to save the values and update the screen.       |

The ensuing table for **SNMP Information** settings are informational only: SNMP.

#### 4.9.2.2 SNMP Community

The SNMP Community page provides configuration options for the community.

SNMP v1 and SNMP v2c use the group name (Community Name) certification. Its role is similar to the password function. If SNMP v1 and SNMP v2c are used, you can go directly from the configuration settings to this page to configure the SNMP community.

To access this page, click **Management > SNMP > SNMP Community**.



**Figure 4.90 Management > SNMP > SNMP Community**

The following table describes the items in the previous figure.

| Item           | Description                                   |
|----------------|---|
| Community Name | Enter a community name (up to 20 characters). |

| Item         | Description  |
|--------------|--|
| Access Right | Click the radio box to specify the access level (read only or read write). |
| Apply        | Click <b>Apply</b> to save the values and update the screen.               |

The ensuing table for **Community Status** settings are informational only: No., Community Name, Access Right and **Delete** (click to delete the desired community name).

#### 4.9.2.3 SNMP User Settings

The SNMP User Settings page allows you to create SNMP groups. The users have the same level of security and access control permissions as defined by the group settings.

To access this page, click **Management > SNMP > SNMP User Settings**.

**Figure 4.91 Management > SNMP > SNMP User Settings**

The following table describes the items in the previous figure.

| Item          | Description   |
|---------------|---|
| User Name     | Enter a user name (up to 32 characters) to create an SNMP profile.  |
| Access Right  | Click <b>read-only</b> or <b>read-write</b> to define the access right for the profile.   |
| Encrypted     | Click the option to set the encrypted option for the user setting.  |
| Auth-Protocol | Click the drop-down menu to select the authentication level: MD5 or SHA. The field requires a user password. <ul style="list-style-type: none"> <li>■ MD5: specify HMAC-MD5-96 authentication level</li> <li>■ SHA: specify HMAC-SHA authentication protocol</li> </ul> |
| Password      | Enter the characters to define the password associated with the authentication protocol.  |
| Priv-Protocol | Click the drop-down menu to select an authorization protocol: none or DES. The field requires a user password. <ul style="list-style-type: none"> <li>■ None: no authorization protocol in use</li> <li>■ DES: specify 56-bit encryption in use</li> </ul>              |
| Password      | Enter the characters to define the password associated with the authorization protocol.   |
| Add           | Click <b>Add</b> to save the values and update the screen.  |

The ensuing table for **User Status** settings are informational only: User Name, Access Right, Auth-Protocol, Priv-Protocol and **Delete** (click to delete the desired user name).

#### 4.9.2.4 SNMP Trap

The SNMP Trap page allows you to set the IP address of the node and the SNMP credentials corresponding to the version that is included in the trap message.

To access this page, click **Management > SNMP > SNMP Trap**.

**Figure 4.92 Management > SNMP > SNMP Trap**

The following table describes the items in the previous figure.

| Item           | Description   |
|----------------|---|
| IP Address     | Enter the IP address to designate the SNMP trap host.                           |
| Community Name | Click the drop-down menu to select a defined community name.                    |
| Version        | Click the drop-down menu to designate the SNMP version credentials (v1 or v2c). |
| Add            | Click <b>Add</b> to save the values and update the screen.                      |

The ensuing table for **Trap Host Status** settings are informational only: No., IP Address, Community Name, Version and **Delete** (click to delete the desired IP address).

### 4.9.3 Power of Ethernet

#### 4.9.3.1 Power of Ethernet

To access this page, click **Management > Power of Ethernet > PoE System Settings**.

**Figure 4.93 Management > Power of Ethernet > PoE System Settings**

The following table describes the items in the previous figure.

| Item                    | Description                            |
|-------------------------|--|
| Maximum Power Available | Enter a value to define maximum power. |

| Item                     | Description  |
|--------------------------|--|
| OverLoad Disconnect Mode | Click the drop-down menu to select the overload disconnect mode: Overload Port First or Port-Based Priority. |
| Apply                    | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **PoE System Information** settings are informational only: Firmware Version, Maximum Power Available, Actual Power Consumption and OverLoad Disconnect TYPE.

#### 4.9.3.2 PoE Port Settings

To access this page, click **Management > Power of Ethernet > PoE Port Settings**.

**Figure 4.94 Management > Power of Ethernet > PoE Port Settings**

The following table describes the items in the previous figure.

| Item                            | Description  |
|---------------------------------|--|
| Port                            | Click the drop-down menu to select the desired port                                |
| Power Switch                    | Click <b>Disabled</b> or <b>Enabled</b> to enable power switch.                    |
| Power Limit From Classification | Click <b>Disabled</b> or <b>Enabled</b> to enable power limit from classification. |
| Legacy Mode                     | Click <b>Disabled</b> or <b>Enabled</b> to enable legacy mode.                     |
| Priority                        | Click the drop-down menu to select the priority: Critical, High, Medium or Low.    |
| Power Limit                     | Enter a value to set power limit.  |
| Apply                           | Click <b>Apply</b> to save the values and update the screen.                       |

The ensuing table for **PoE System Information** settings are informational only: Port, Switch State, Power Limit From Classification, Priority, Legacy Mode and Power Limit (W).

#### 4.9.3.3 PoE Port Status

To access this page, click **Management > Power of Ethernet > PoE Port Status**.

The ensuing table for **PoE Port Status** settings are informational only: Port, Current (mA), Voltage (V), Power (W) and Temp. °C.

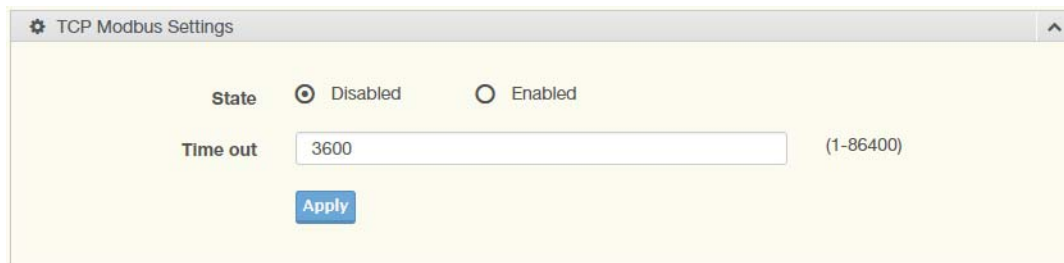
## 4.9.4 Modbus TCP Settings

The TCP Modbus function allows for client-server communication between a switch module (server) and a device in the networking running MODBUS client software (client).

### 4.9.4.1 Modbus TCP Settings

The Modbus TCP Settings page allows you to configure the modbus function.

To access this page, click **Management > Modbus TCP Settings > Modbus TCP Settings**.



**Figure 4.95 Management > Modbus TCP Settings > Modbus TCP Settings**

The following table describes the items in the previous figure.

| Item     | Description   |
|----------|---|
| State    | Click <b>Disabled</b> or <b>Enabled</b> to set the TCP Modbus state.              |
| Time out | Enter the value (1 to 86400) to define the timeout period between transport time. |
| Apply    | Click <b>Apply</b> to save the values and update the screen.                      |

The ensuing table for **TCP Modbus Status** settings are informational only: TCP Modbus status and TCP Modbus time out.

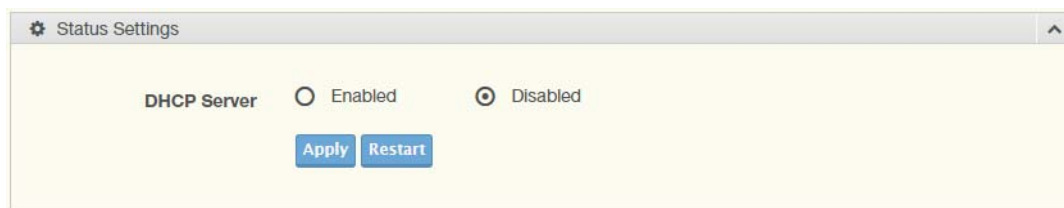
## 4.9.5 DHCP Server

The Dynamic Host Configuration Protocol (DHCP) is a network protocol enabling a server to automatically assign an IP address to a computer from a defined range of numbers configured for a given network.

### 4.9.5.1 Status Settings

The Status Settings page allows you to configure the DHCP server mode (enabled or disabled).

To access this page, click **Management > DHCP Server > Status Settings**.



**Figure 4.96 Management > DHCP Server > Status Settings**

The following table describes the items in the previous figure.

| Item        | Description  |
|-------------|--|
| DHCP Server | Select <b>Enable</b> or <b>Disable</b> to designate the DHCP server function type.<br>When a new DHCP server mode is selected, the switch requires a system restart for the new mode to take effect. |
| Apply       | Click <b>Apply</b> to save the values and update the screen.   |
| Restart     | Click <b>Restart</b> to have the switch perform a system restart function. In the event that the IP settings are changed, the DHCP server must be restarted for the IP settings to take effect.      |

The ensuing table for **Status Information** settings are informational only: DHCP Server Service.

#### 4.9.5.2 Global Settings

The Global Settings page allows you to configure the global settings for the DHCP function.

To access this page, click **Management > DHCP Server > Global Settings**.

**Figure 4.97 Management > DHCP Server > Global Settings**

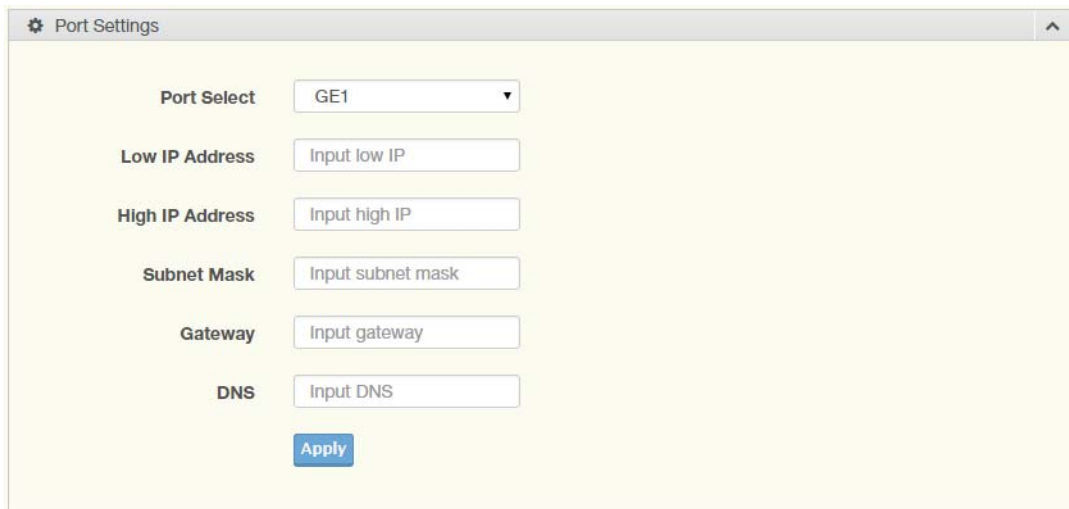
The following table describes the items in the previous figure.

| Item            | Description   |
|-----------------|---|
| Lease Time      | Type in the value designating the lease time (60 - 864000) in seconds for each setting lease. |
| Low IP Address  | Type in the value designating the lowest range in the IP address pool.                        |
| High IP Address | Type in the value designating the highest range in the IP address pool.                       |
| Subnet Mask     | Type in the value designating the subnet mask for the IP address pool.                        |
| Gateway         | Type in the value designating the gateway for the IP address pool.                            |
| DNS             | Type in the value designating the DNS for the IP address pool.                                |
| Apply           | Click <b>Apply</b> to save the values and update the screen.                                  |

The ensuing table for **Global Information** settings are informational only: Lease Time, Low IP Address, High IP Address, Subnet Mask, Gateway, DNS and **Clear** (click to clear IP pool).

### 4.9.5.3 Port Settings

The Port Settings page allows you to configure selected ports for the DHCP function. To access this page, click **Management > DHCP Server > Port Settings**.



**Figure 4.98 Management > DHCP Server > Port Settings**

The following table describes the items in the previous figure.

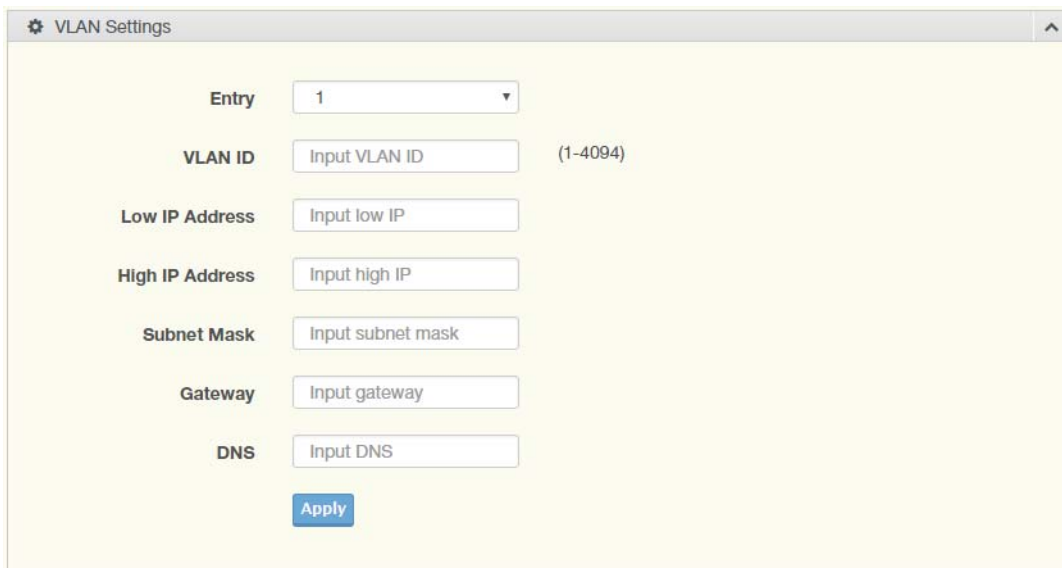
| Item            | Description  |
|-----------------|--|
| Port Select     | Click the drop-down menu to select a pre-defined port to configure. The suboptions are designated for the selected port. |
| Low IP Address  | Type in the value designating the lowest range in the IP address pool.   |
| High IP Address | Type in the value designating the highest range in the IP address pool.  |
| Subnet Mask     | Type in the value designating the subnet mask for the IP address pool.   |
| Gateway         | Type in the value designating the gateway for the IP address pool.   |
| DNS             | Type in the value designating the DNS for the IP address pool.   |
| Apply           | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **Port Information** settings are informational only: Port, Low IP Address, High IP Address, Subnet Mask, Gateway, DNS, **Edit** (click to modify the settings) and **Clear** (click to clear the settings).



#### 4.9.5.4 VLAN Settings

To access this page, click **Management > DHCP Server > VLAN Settings**.



**Figure 4.99 Management > DHCP Server > VLAN Settings**

The following table describes the items in the previous figure.

| Item            | Description   |
|-----------------|---|
| Entry           | Click the drop-down menu to select an entry for the VLAN setting.       |
| VLAN ID         | Type in the value designating the VLAN ID.                              |
| Low IP Address  | Type in the value designating the lowest range in the IP address pool.  |
| High IP Address | Type in the value designating the highest range in the IP address pool. |
| Subnet Mask     | Type in the value designating the subnet mask for the IP address pool.  |
| Gateway         | Type in the value designating the gateway for the IP address pool.      |
| DNS             | Type in the value designating the DNS for the IP address pool.          |
| Apply           | Click <b>Apply</b> to save the values and update the screen.            |

The ensuing table for **Entry Information** settings are informational only and display the following: **Entry** (click the drop-down menu to select an entry), Entry ID, VLAN ID, Low IP Address, High IP Address, Subnet Mask, Gateway, DNS, **Edit** (click to modify the settings) and **Clear** (click to clear the settings).

#### 4.9.5.5 Option 82 Settings

The Option 82 Settings, also known as the DHCP relay agent information option, provide information about the network location of a DHCP client. In turn, the DHCP server uses the information to implement IP addresses or other parameters for the client.

To access this page, click **Management > DHCP Server > Option 82 Settings**.

**Figure 4.100 Management > DHCP Server > Option 82 Settings**

The following table describes the items in the previous figure.

| Item               | Description   |
|--------------------|---|
| Entry              | Click the drop-down menu to select an entry for the Option 82 setting.          |
| Circuit ID Format  | Click the drop-down menu to select the format of the circuit ID: string or hex. |
| Circuit ID Content | Enter the circuit ID string on the switch on which the request was received.    |
| Remote ID Format   | Click the drop-down menu to select the format of the remote ID: string or hex.  |
| Remote ID Content  | Enter the remote ID string of the host.   |
| Low IP Address     | Type in the value designating the lowest range in the IP address pool.          |
| High IP Address    | Type in the value designating the highest range in the IP address pool.         |
| Subnet Mask        | Type in the value designating the subnet mask for the IP address pool.          |
| Gateway            | Type in the value designating the gateway for the IP address pool.              |
| DNS                | Type in the value designating the DNS for the IP address pool.                  |
| Apply              | Click <b>Apply</b> to save the values and update the screen.                    |

The ensuing table for **Entry Information** settings are informational only: **Entry** (click the drop-down menu to select an entry), Entry ID, Circuit ID Format, Circuit ID Content, Remote ID Format, Remote ID Content, Low IP Address, High IP Address, Subnet Mask, Gateway, DNS, **Edit** (click to modify the settings) and **Clear** (click to clear the settings).

#### 4.9.5.6 Lease Entry

To access this page, click **Management > DHCP Server > Lease Entry**.

The ensuing table for **Lease entry Table** settings are informational only: IP Address, Client Mac, Start Time, End Time and Type.

#### 4.9.6 SMTP Client

Simple Mail Transfer Protocol (SMTP) is a protocol to send e-mail messages between servers. SMTP is used to send messages from a mail client to a mail server. SMTP by default uses TCP port 25.

##### 4.9.6.1 Global Settings

The Global Settings page allows you to set the active profile for the SMTP client.

To access this page, click **Management > SMTP Client > Global Settings**.



**Figure 4.101 Management > SMTP Client > Global Settings**

The following table describes the items in the previous figure.

| Item           | Description   |
|----------------|---|
| Active Profile | Click the drop-down menu to select the profile status (None, 1 or 2). |
| Apply          | Click <b>Apply</b> to save the values and update the screen.          |

The ensuing table for **SMTP Information** settings are informational only: Active Profile Id.

##### 4.9.6.2 Profile Settings

The Profile Settings page allows you to select the server IP, the server port, and sender mail for the listed profile.

To access this page, click **Management > SMTP Client > Profile Settings**.



**Figure 4.102 Management > SMTP Client > Profile Settings > Profile Settings**

The following table describes the items in the previous figure.

| Item       | Description  |
|------------|--|
| Profile ID | Click the drop-down menu to select the identification type for the profile (1 or 2). |
| Server IP  | Enter the IP address to designate the server host.                                   |

| Item        | Description  |
|-------------|--|
| Server Port | Enter the port number to designate the port associated with the server IP address. |
| Sender Mail | Enter the email address of the sender client.                                      |
| Apply       | Click <b>Apply</b> to save the values and update the screen.                       |

**Figure 4.103 Management > SMTP Client > Profile Settings > Profile Target Mail Settings**

The following table describes the items in the previous figure.

| Item        | Description  |
|-------------|--|
| Profile ID  | Click the drop-down menu to select the identification type for the profile (1 or 2). |
| Target Mail | Enter the email address of the target client.  |
| Apply       | Click <b>Apply</b> to save the values and update the screen.                         |

The ensuing table for **Profile Information** settings are informational only: **Profile ID** (click the drop-down menu to select a profile ID), Server IP, Server Port and Sender Mail Address.

#### 4.9.6.3 Sending Message

The Sending Message page allows you to setup the log message for use with the SMTP client.

To access this page, click **Management > SMTP Client > Sending Message**.

**Figure 4.104 Management > SMTP Client > Sending Message**

The following table describes the items in the previous figure.

| Item    | Description   |
|---------|---|
| Title   | Assign the title of the email. The maximum length is 20 characters (alphanumeric, symbols (. dot), _ (underline), - (dash line) and space).   |
| Content | Assign the content of the email. The maximum length is 64 characters (alphanumeric, symbols (. dot), _ (underline), - (dash line) and space). |
| Apply   | Click <b>Apply</b> to save the values and update the screen.  |

## 4.9.7 RMON

Remote monitoring (RMON) uses a client-server model to monitor/manage remote devices on a network.

### 4.9.7.1 RMON Statistics

The RMON Statistics page allows you to view information regarding packet sizes and information for physical layer errors. The information displayed is according to the RMON standard.

To access this page, click **Management > RMON > RMON Statistics**.

**Figure 4.105 Management > RMON > Rmon Statistics**

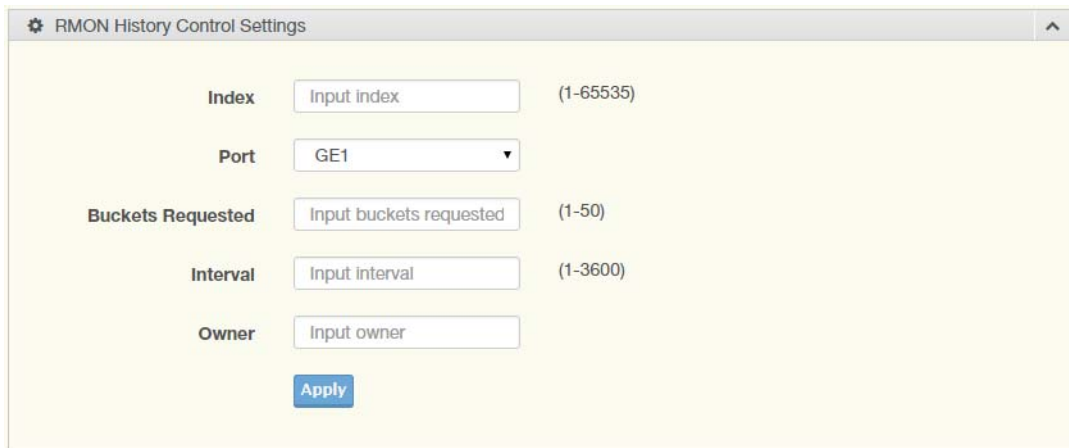
The following table describes the items in the previous figure.

| Item  | Description   |
|-------|---|
| Index | Enter an entry selection (1 to 65535) to display its statistical information. |
| Port  | Enter the respective port number for the selected entry.                      |
| Owner | Enter the name of the owner of the RMON group.                                |
| Apply | Click <b>Apply</b> to save the values and update the screen.                  |

The ensuing table for **Statistics Information** settings are informational only: Index, Port, Drop Events, Octets, Packets, Broadcast, Multicast, Owner and **Delete** (click to delete the desired index).

#### 4.9.7.2 RMON History

The RMON History page allows you to configure the display of history entries. To access this page, click **Management > RMON > RMON History**.



**Figure 4.106 Management > RMON > RMON History**

The following table describes the items in the previous figure.

| Item              | Description   |
|-------------------|---|
| Index             | Enter the index entry (1 to 65535) to select the number of new history table entries.                   |
| Port              | Select the specific port switch.  |
| Buckets Requested | Enter the specific (1-50) number of samples to store.   |
| Interval          | Enter value in seconds (1 to 3600) to designate a specific interval time for the collection of samples. |
| Owner             | Enter the name of the owner of the RMON history group.  |
| Apply             | Click <b>Apply</b> to save the values and update the screen.  |

The ensuing table for **History Information** settings are informational only: Index, Port, Buckets Requested, Interval, Owner and **Delete** (click to delete the desired index).

### 4.9.7.3 RMON Alarm

The RMON Alarm page allows you to configure RMON statistics group and alarm groups.

To access this page, click **Management > RMON > RMON Alarm**.

**Figure 4.107 Management > RMON > Rmon Alarm**

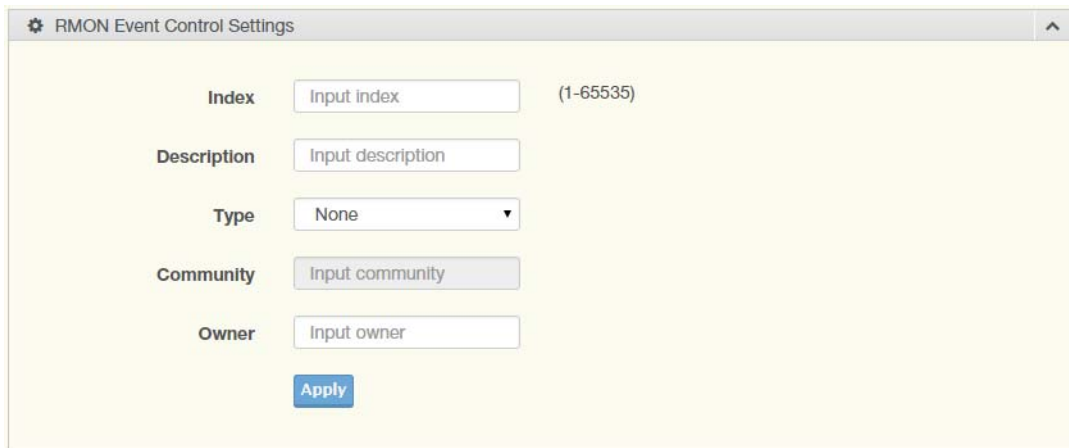
The following table describes the items in the previous figure.

| Item                | Description  |
|---------------------|--|
| Index               | Enter the index entry (1 to 65535) to define a specific Alarm Collection history entry.        |
| Interval            | Enter a value (1 to 2147483647) to define the interval value for the Alarm Collection history. |
| Variable            | Enter the alarm variables to define the monitoring triggers.                                   |
| Sample Type         | Enter the variable sample type.  |
| Rising Threshold    | Enter the rising alarm threshold (1-2147483647) trigger.                                       |
| Falling Threshold   | Enter the falling alarm threshold (1-2147483647) trigger.                                      |
| Rising Event Index  | Enter the rising event index (1-65535) to define the alarm group.                              |
| Falling Event Index | Enter the falling event index (1-65535) to define the alarm group.                             |
| Owner               | Enter the name of the owner of the RMON alarm group.   |
| Apply               | Click <b>Apply</b> to save the values and update the screen.                                   |

The ensuing table for **Alarm Information** settings are informational only: Index, Interval, Variable, Sample Type, Rising Threshold, Falling Threshold, Rising Event Index, Falling Event Index, Owner and **Delete** (click to delete the desired index).

#### 4.9.7.4 RMON Event

The RMON Event page is used to configure RMON event groups.  
To access this page, click **Management > RMON > RMON Event**.



**Figure 4.108 Management > RMON > RMON Event**

The following table describes the items in the previous figure.

| Item        | Description  |
|-------------|--|
| Index       | Enter the index entry (1 to 65535) to define a specific RMON event.                            |
| Description | Enter a value (1 to 2147483647) to define the interval value for the Alarm Collection history. |
| Type        | Click the drop-down menu to define the event type: None, Log, SNMP Trap, Log and Trap.         |
| Community   | Enter the community string to be passed for the specified event.                               |
| Owner       | Enter the name of the owner of the RMON event.   |
| Apply       | Click <b>Apply</b> to save the values and update the screen.                                   |

The ensuing table for **Event Information** settings are informational only: Index, Description, Type, Community, Owner and **Delete** (click to delete the desired index).



## 4.10 Diagnostics

Through the Diagnostics function configuration of settings for the switch diagnostics is available.

### 4.10.1 Cable Diagnostics

The Cable Diagnostics page allows you to select the port for applying a copper test. To access this page, click **Diagnostics > Cable Diagnostics**.



**Figure 4.109 Diagnostics > Cable Diagnostics**

The following table describes the items in the previous figure.

| Item        | Description   |
|-------------|---|
| Port        | Click the drop-down menu to select a pre-defined port for diagnostic testing. Giga ports are displayed with a channel A to D designation. |
| Copper Test | Click <b>Copper Test</b> to display the test result for the selected port.  |

The ensuing table for **Test Result** settings are informational only: Port, Channel A, Cable Length A, Channel B, Cable Length B, Channel C, Cable Length C, Channel D and Cable Length D.

### 4.10.2 Ping Test

The Ping Test page allows you to configure the test log page.

To access this page, click **Diagnostics > Ping Test**.

**Figure 4.110 Diagnostics > Ping Test**

The following table describes the items in the previous figure.

| Item              | Description   |
|-------------------|---|
| IP Address        | Enter the IP address or host name of the station to ping. The initial value is blank. The IP Address or host name you enter is not retained across a power cycle. Host names are composed of series of labels concatenated with periods. Each label must be between 1 and 63 characters long, maximum of 64 characters. |
| Count             | Enter the number of echo requests to send. The default value is 4. The value ranges from 1 to 5. The count entered is not retained across a power cycle.  |
| Interval (in sec) | Enter the interval between ping packets in seconds. The default value is 1. The value ranges from 1 to 5. The interval entered is not retained across a power cycle.  |
| Size (in bytes)   | Enter the size of ping packet. The default value is 56. The value ranges from 8 to 5120. The size entered is not retained across a power cycle.   |

| Item         | Description   |
|--------------|---|
| Ping Results | Display the reply format of ping.<br>PING 172.17.8.254 (172.17.8.254): 56 data bytes<br><br>--- 172.17.8.254 ping statistics ---<br>4 packets transmitted, 0 packets received, 100% packet loss<br>Or<br>PING 172.17.8.93 (172.17.8.93): 56 data bytes<br>64 bytes from 172.17.8.93: icmp_seq=0 ttl=128 time=0.0 ms<br>64 bytes from 172.17.8.93: icmp_seq=1 ttl=128 time=0.0 ms<br>64 bytes from 172.17.8.93: icmp_seq=2 ttl=128 time=0.0 ms<br>64 bytes from 172.17.8.93: icmp_seq=3 ttl=128 time=0.0 ms<br><br>--- 172.17.8.93 ping statistics ---<br>4 packets transmitted, 4 packets received, 0% packet loss<br>round-trip min/avg/max = 0.0/0.0/0.0 ms |
| Apply        | Click <b>Apply</b> to display ping result for the IP address.   |

### 4.10.3 IPv6 Ping Test

The IPv6 Ping Test page allows you to configure the Ping Test for IPv6.

To access this page, click **Diagnostics > IPv6 Ping Test**.

Figure 4.111 Diagnostics > IPv6 Ping Test

The following table describes the items in the previous figure.

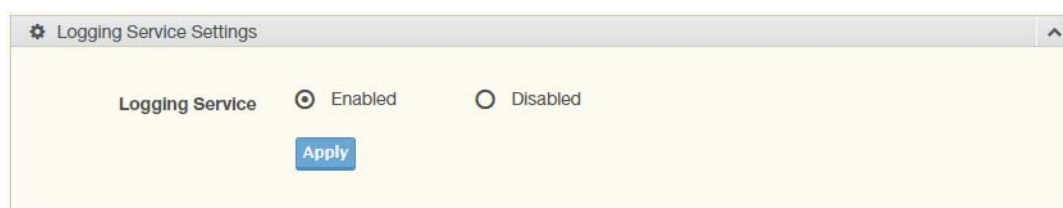
| Item              | Description   |
|-------------------|---|
| IPv6 Address      | Enter the IP address or host name of the station you want the switch to ping. The initial value is blank. The IP Address or host name you enter is not retained across a power cycle. Host names are composed of series of labels concatenated with dots. Each label must be between 1 and 63 characters long, and the entire hostname has a maximum of 64 characters.  |
| Count             | Enter the number of echo requests you want to send. The default value is 4. The value ranges from 1 to 5. The count you enter is not retained across a power cycle.   |
| Interval (in sec) | Enter the interval between ping packets in seconds. The default value is 1. The value ranges from 1 to 5. The interval you enter is not retained across a power cycle.  |
| Size (in bytes)   | Enter the size of ping packet. The default value is 56. The value ranges from 8 to 5120. The size you enter is not retained across a power cycle.   |
| Ping Results      | <p>Display the reply format of ping.</p> <p>PING 2222::777 (2222::777): 56 data bytes</p> <p>---</p> <p>--- 2222::777 ping statistics ---</p> <p>4 packets transmitted, 0 packets received, 100% packet loss</p> <p>Or</p> <p>PING 2222::717 (2222::717): 56 data bytes</p> <p>64 bytes from 2222::717: icmp6_seq=0 ttl=128 time=10.0 ms</p> <p>64 bytes from 2222::717: icmp6_seq=1 ttl=128 time=0.0 ms</p> <p>64 bytes from 2222::717: icmp6_seq=2 ttl=128 time=0.0 ms</p> <p>64 bytes from 2222::717: icmp6_seq=3 ttl=128 time=0.0 ms</p> <p>---</p> <p>--- 2222::717 ping statistics ---</p> <p>4 packets transmitted, 4 packets received, 0% packet loss</p> <p>round-trip min/avg/max = 0.0/2.5/10.0 ms</p> |
| Apply             | Click <b>Apply</b> to display ping result for the IP address.   |

## 4.10.4 System Log

### 4.10.4.1 Logging Service

The Logging Service page allows you to setup the logging services feature for the system log.

To access this page, click **Diagnostics > System Log > Logging Service**.



**Figure 4.112 Diagnostics > System Log > Logging Service**

The following table describes the items in the previous figure.

| Item            | Description  |
|-----------------|--|
| Logging Service | Click Enabled or Disabled to set the Logging Service status. |
| Apply           | Click <b>Apply</b> to save the values and update the screen. |

The ensuing table for **Logging Information** settings are informational only: Logging Service.

#### 4.10.4.2 Local Logging

The Local Logging page allows you to designate a local target when the severity criteria is reached.

To access this page, click **Diagnostics > System Log > Local Logging**.

**Figure 4.113 Diagnostics > System Log > Local Logging**

The following table describes the items in the previous figure.

| Item     | Description  |
|----------|--|
| Target   | Enter the local logging target.  |
| Severity | Click the drop-down menu to select the severity level for local log messages.<br>The level options are: <ul style="list-style-type: none"> <li>■ emerg: Indicates system is unusable. It is the highest level of severity</li> <li>■ alert: Indicates action must be taken immediately</li> <li>■ crit: Indicates critical conditions</li> <li>■ error: Indicates error conditions</li> <li>■ warning: Indicates warning conditions</li> <li>■ notice: Indicates normal but significant conditions</li> <li>■ info: Indicates informational messages</li> <li>■ debug: Indicates debug-level messages</li> </ul> |
| Apply    | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **Local Logging Settings Status** settings are informational only: Status, Target, Severity and **Delete** (click to delete the desired target).

#### 4.10.4.3 System Log Server

The System Log Server page allows you to configure the log server.

To access this page, click **Diagnostics > System Log > System Log Server**.

**Figure 4.114 Diagnostics > System Log > System Log Server**

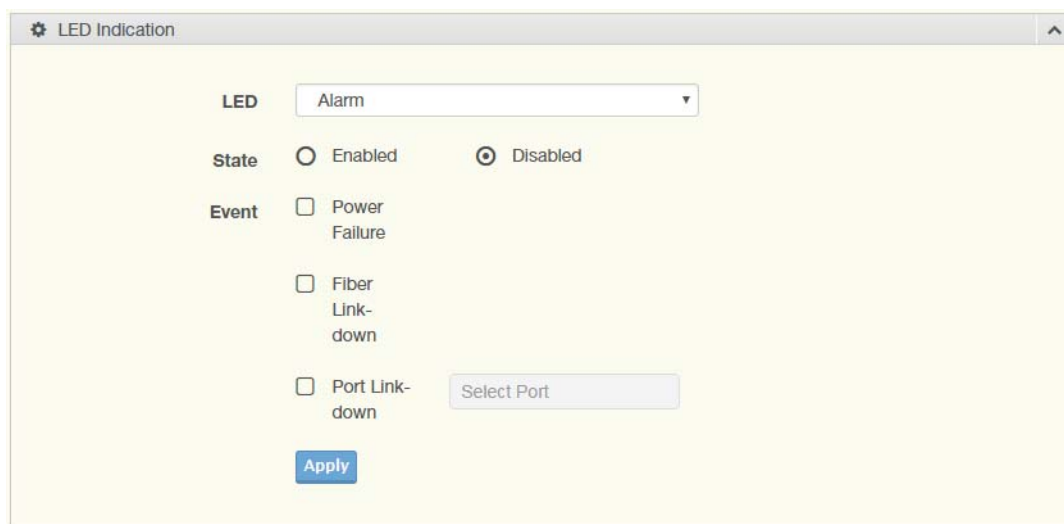
The following table describes the items in the previous figure.

| Item           | Description  |
|----------------|--|
| Server Address | Enter the IP address of the log server.  |
| Server Port    | Enter the Udp port number of the log server.   |
| Severity       | Click the drop-down menu to select the severity level for local log messages. The default is emerg.<br>The level options are: <ul style="list-style-type: none"> <li>■ emerg: Indicates system is unusable. It is the highest level of severity</li> <li>■ alert: Indicates action must be taken immediately</li> <li>■ crit: Indicates critical conditions</li> <li>■ error: Indicates error conditions</li> <li>■ warning: Indicates warning conditions</li> <li>■ notice: Indicates normal but significant conditions</li> <li>■ info: Indicates informational messages</li> <li>■ debug: Indicates debug-level messages</li> </ul> |
| Facility       | Click the drop-down menu to select facility to which the message refers.   |
| Apply          | Click <b>Apply</b> to save the values and update the screen.   |

The ensuing table for **Remote Logging Setting Status** settings are informational only: Status, Server Info, Severity, Facility and **Delete** (click to delete the desired server address).

#### 4.10.5 LED Indication

This function specifies the state of the LED indicators and the available events.  
To access this page, click **Diagnostics > LED Indication**.



**Figure 4.115 Diagnostics > LED Indication**

The following table describes the items in the previous figure.

| Item  | Description  |
|-------|--|
| LED   | Click the drop-down menu to select LED indicator.            |
| State | Select Enable or Disable to enable LED alarm.                |
| Event | Click to select the event of LED alarm.                      |
| Apply | Click <b>Apply</b> to save the values and update the screen. |

The ensuing table for **LED Information** settings are informational only: LED and State.

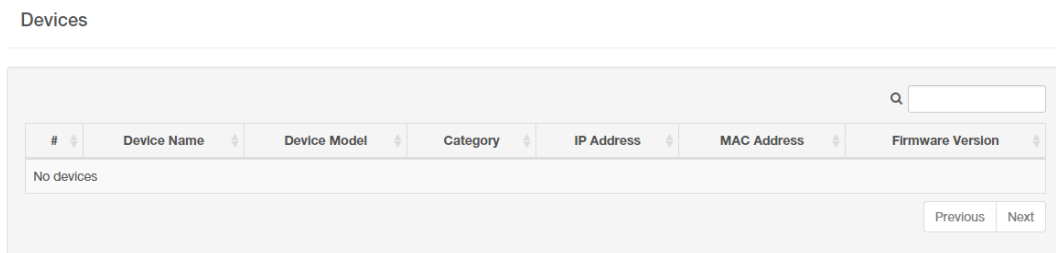
The ensuing table for **Event Information** settings are informational only: LED, Event, State, and Delete.

## 4.11 Tools

### 4.11.1 IXM

The IXM tool is an industrial Ethernet switch solution to help the users deploy industrial Ethernet switch hardware by allowing users with multiple, managed Ethernet switches in the field to eliminate the need to individually connect to each device to configure it.

To access this page, click **Tools > IXM**.



**Figure 4.116 Tools > IXM**

The following table describes the items in the previous figure.

| Item             | Description                                     |
|------------------|---|
| Search Field     | Enter criteria to search the IXM information.   |
| #                | Displays the reference to the device number.    |
| Device Name      | Displays the device name.                       |
| Device Model     | Displays the device model type.                 |
| Category         | Displays the device's category type.            |
| IP Address       | Displays the device's IP address.               |
| MAC Address      | Displays the device's IP MAC address.           |
| Firmware Version | Displays the device's firmware version.         |
| System Indicator | Displays the device's system indicator.         |
| Previous         | Click <b>Previous</b> to back to previous page. |
| Next             | Click <b>Next</b> to go to next page.           |

## 4.11.2 Backup Manager

The Backup Manager page allows you to configure a remote TFTP sever or host file system in order to backup the firmware image or configuration file.

To access this page, click **Tools > Backup Manager**.

The screenshot shows the Backup Manager configuration interface. It includes a title bar 'Backup' with a gear icon and an up arrow. The main content area is light yellow. It contains four sections: 'Backup Method' with a dropdown menu set to 'TFTP'; 'Server IP' with a text input field containing 'Input IP' and a note '(IPv4 or IPv6 Address)'; 'Backup Type' with five radio button options: 'Image' (selected), 'Running configuration', 'Startup configuration', 'Flash log', and 'Buffered log'; and 'Image' with two radio button options: 'Partition0 (Active)' (selected) and 'Partition1 (Backup)'. At the bottom is a blue 'Backup' button.

**Figure 4.117 Tools > Backup Manager**

The following table describes the items in the previous figure.

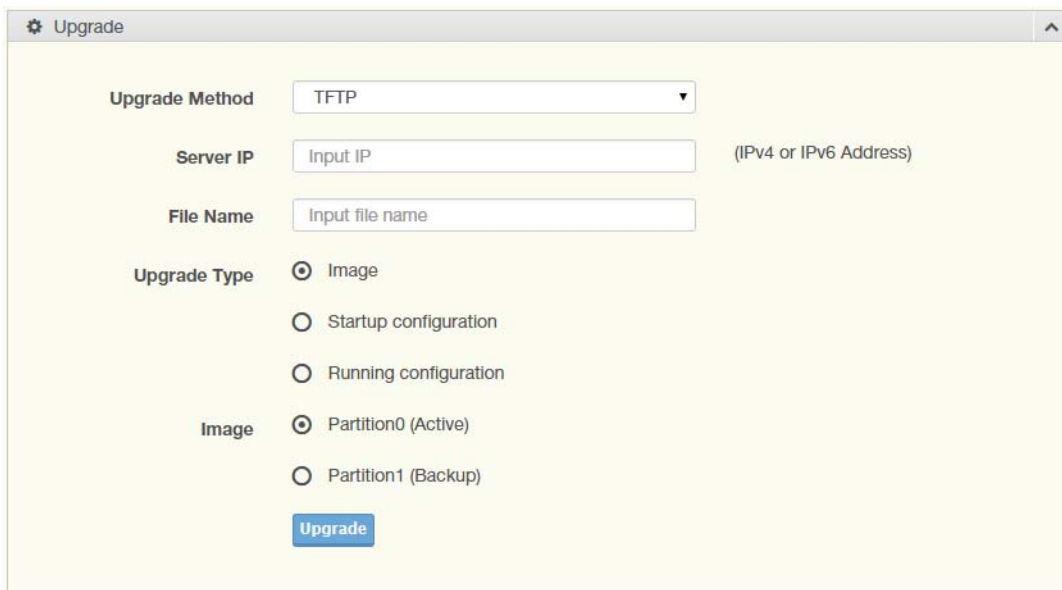
| Item          | Description  |
|---------------|--|
| Backup Method | Click the drop-down menu to select the backup method: TFTP or HTTP.  |
| Server IP     | Enter the IP address of the backup server.   |
| Backup Type   | Click a type to define the backup method: image: running configuration, startup configuration, flash log, or buffered log. |
| Image         | Click the format for the image type: 7720E_2C_1_00_13.bix (Active) or vmlinux.bix (backup).                                |
| Backup        | Click <b>Backup</b> to backup the settings.  |



### 4.11.3 Upgrade Manager

The Upgrade Manager page allows you to configure a remote TFTP sever or host file system in order to upload firmware upgrade images or configuration files.

To access this page, click **Tools > Upgrade Manager**.



**Figure 4.118 Tools > Upgrade Manager**

The following table describes the items in the previous figure.

| Item           | Description  |
|----------------|--|
| Upgrade Method | Click the drop-down menu to select the upgrade method: TFTP or HTTP.                               |
| Server IP      | Enter the IP address of the upgrade server.  |
| File Name      | Enter the file name of the new firmware version.   |
| Upgrade Type   | Click a type to define the upgrade method: image, startup configuration, or running configuration. |
| Image          | Click the format for the image type: Partition0 (Active), Partition1 (backup) or Auto.             |
| Upgrade        | Click <b>Upgrade</b> to upgrade to the current version.  |

### 4.11.4 Dual Image

The Dual Image page allows you to setup an active and backup partitions for firmware image redundancy.

To access this page, click **Tools > Dual Image**.



**Figure 4.119 Tools > Dual Image**

The following table describes the items in the previous figure.

| Item         | Description  |
|--------------|--|
| Active Image | Click the format for the image type: Partition0 (Active) or Partition1 (backup). |
| Save         | Click <b>Save</b> to save and keep the new settings.                             |

The ensuing table for **Image Information 0/1** settings are informational only: Flash Partition, Image Name, Image Size and Created Time.

#### 4.11.5 Save Configuration

To access this page, click **Tools > Save Configuration**.

Click **Save Configuration to FLASH** to have configuration changes you have made to be saved across a system reboot. All changes submitted since the previous save or system reboot will be retained by the switch.

#### 4.11.6 User Account

The User Account page allows you to setup a user and the related parameters.

To access this page, click **Tools > User Account**.

**Figure 4.120 Tools > User Account**

The following table describes the items in the previous figure.

| Item            | Description   |
|-----------------|---|
| User Name       | Enter the name of the new user entry.   |
| Password Type   | Click the drop-down menu to define the type of password: <b>Clear Text</b> , <b>Encrypted</b> or <b>No Password</b> . |
| Password        | Enter the character set for the define password type.   |
| Retype Password | Retype the password entry to confirm the profile password.  |
| Privilege Type  | Click the drop-down menu to designate privilege authority for the user entry: <b>Admin</b> or <b>User</b> .           |
| Apply           | Click <b>Apply</b> to create a new user account.  |

The ensuing table for **Local Users** settings are informational only: User Name, Password Type, Privilege Type and **Delete** (click to delete the desired user account).

## 4.11.7 Reset System

To access this page, click **Tools > Reset System**.

Click **Restore** to have all configuration parameters reset to their factory default values. All changes that have been made will be lost, even if you have issued a save.

Reset settings take effect after a system reboot.

## 4.11.8 Reboot Device

To access this page, click **Tools > Reboot Device**.

Click **Reboot** to reboot the switch. Any configuration changes you have made since the last time you issued a save will be lost.

## 4.12 Modbus/TCP Mapping

The data map addresses of Advantech switches shown in the following table start from Modbus address 30001 for function code 4.

In the given example, the address offset 0x1000 (hex) equals Modbus address 34097, while the address offset 0x1100 (hex) equals Modbus address 34353.

The information given by the Advantech is shown in hex mode.

### 4.12.1 Modbus/TCP Mapping Table

| Catalog          | Name                      | Data Type            | Interpretation | Address Offset (Hex) | Address 3X   | Description   |
|------------------|---------------------------|----------------------|----------------|----------------------|--|---|
| System Info      | Vendor ID = 0x13FE        | 1 word<br>16 bits    | HEX            | 0x0000               | 30001  | Vendor ID = 0x13FE  |
|                  | Unit ID = 0xFF            | 1 word<br>16 bits    | HEX            | 0x0001               | 30002  | Unit ID = 0xFF  |
|                  | Product Code              | 1 word<br>16 bits    | HEX            | 0x0002               | 30003  | Product Code  |
|                  | Vendor Name = "Advantech" | 16 words<br>32 chars | ASCII          | 0x0010               | 30017  | Vendor Name =<br>"Advantech"<br>Word 0 Hi byte = 'A'<br>Word 0 Lo byte = 'd'<br>Word 1 Hi byte = 'v'<br>Word 1 Lo byte = 'a'<br>Word 2 Hi byte = 'n'<br>Word 2 Lo byte = 't'<br>Word 3 Hi byte = 'e'<br>Word 3 Lo byte = 'c'<br>Word 4 Hi byte = 'h'<br>Word 4 Lo byte = '\0' |
|                  | Product Name = "EKI-xxxx" | 16 words<br>32 chars | ASCII          | 0x0020               | 30033  | Product Name =<br>"EKI-xxxx"<br>Word 0 Hi byte = 'E'<br>Word 0 Lo byte = 'K'<br>Word 1 Hi byte = 'I'<br>Word 1 Lo byte = '-'<br>Word 2 Hi byte = 'x'<br>Word 2 Lo byte = 'x'<br>Word 3 Hi byte = 'x'<br>Word 3 Lo byte = 'x'<br>Word 4 Hi byte = '\0'                         |
| Firmware Version | 2 words<br>32 bits        | HEX                  | 0x020A         | 30523                | Firmware Version<br>Word 0 Hi byte = major<br>Word 0 Lo byte = minor<br>Word 1 Hi byte = release<br>Word 1 Lo byte = build |   |

| Catalog     | Name                 | Data Type | Interpretation | Address Offset (Hex) | Address 3X      | Description   |   |
|-------------|----------------------|-----------|----------------|----------------------|-----------------|---------------|---|
| System Info | Ethernet MAC Address | 3 words   | 48 bits        | HEX                  | 0x020E          | 30527         | Ethernet MAC Address<br>Ex: MAC = 00-19-CB-01-02-03<br>Word 0 Hi byte = 0x00<br>Word 0 Lo byte = 0x19<br>Word 1 Hi byte = 0xCB<br>Word 1 Lo byte = 0x01<br>Word 2 Hi byte = 0x02<br>Word 2 Lo byte = 0x03   |
|             | Revision Number      | 16 words  | 32 chars       | ASCII                | 0x0211          | 30530         | Product Name = "YY.xxxx"<br>Word 0 Hi byte = 'Y'<br>Word 0 Lo byte = 'Y'<br>Word 1 Hi byte = 'Y'<br>Word 1 Lo byte = '.'<br>Word 2 Hi byte = 'x'<br>Word 2 Lo byte = 'x'<br>Word 3 Hi byte = 'x'<br>Word 3 Lo byte = 'x'<br>Word 4 Hi byte = 'x'<br>Word 4 Lo byte = '\0' |
|             | IP Address           | 2 words   | 32 bits        | HEX                  | 0x0400          | 31025         | IP Address<br>Ex: IP = 192.168.1.1<br>Word 0 Hi byte = 0xC0<br>Word 0 Lo byte = 0xA8<br>Word 1 Hi byte = 0x01<br>Word 1 Lo byte = 0x01  |
| Port Info   | Port Status          | 1 word    | 16 bits        | HEX                  | 0x1000 ~ 0x101F | 34097 ~ 34128 | Port Status<br>0x0000: Link down<br>0x0001: Link up<br>0xFFFF: No port  |
|             | Port 1 Status        | 1 word    | 16 bits        | HEX                  | 0x1000          | 34097         |   |
|             | Port 2 Status        | 1 word    | 16 bits        | HEX                  | 0x1001          | 34098         |   |
|             | Port 3 Status        | 1 word    | 16 bits        | HEX                  | 0x1002          | 34099         |   |
|             | Port 4 Status        | 1 word    | 16 bits        | HEX                  | 0x1003          | 34100         |   |
|             | Port 5 Status        | 1 word    | 16 bits        | HEX                  | 0x1004          | 34101         |   |
|             | Port 6 Status        | 1 word    | 16 bits        | HEX                  | 0x1005          | 34102         |   |
|             | Port 7 Status        | 1 word    | 16 bits        | HEX                  | 0x1006          | 34103         |   |
|             | Port 8 Status        | 1 word    | 16 bits        | HEX                  | 0x1007          | 34104         |   |
|             | Port 9 Status        | 1 word    | 16 bits        | HEX                  | 0x1008          | 34105         |   |
|             | Port 10 Status       | 1 word    | 16 bits        | HEX                  | 0x1009          | 34106         |   |
|             | Port 11 Status       | 1 word    | 16 bits        | HEX                  | 0x100A          | 34107         |   |
|             | Port 12 Status       | 1 word    | 16 bits        | HEX                  | 0x100B          | 34108         |   |
|             | Port 13 Status       | 1 word    | 16 bits        | HEX                  | 0x100C          | 34109         |   |
|             | Port 14 Status       | 1 word    | 16 bits        | HEX                  | 0x100D          | 34110         |   |

| Catalog     | Name                 | Data Type | Interpretation | Address Offset (Hex) | Address 3X      | Description   |  |
|-------------|----------------------|-----------|----------------|----------------------|-----------------|---------------|--|
| System Info | Ethernet MAC Address | 3 words   | 48 bits        | HEX                  | 0x020E          | 30527         | Ethernet MAC Address<br>Ex: MAC = 00-19-CB-01-02-03<br>Word 0 Hi byte = 0x00<br>Word 0 Lo byte = 0x19<br>Word 1 Hi byte = 0xCB<br>Word 1 Lo byte = 0x01<br>Word 2 Hi byte = 0x02<br>Word 2 Lo byte = 0x03  |
|             | Revision Number      | 16 words  | 32 chars       | ASCII                | 0x0211          | 30530         | Product Name = "YY.xxxxx"<br>Word 0 Hi byte = 'Y'<br>Word 0 Lo byte = 'Y'<br>Word 1 Hi byte = 'Y'<br>Word 1 Lo byte = '.'<br>Word 2 Hi byte = 'x'<br>Word 2 Lo byte = 'x'<br>Word 3 Hi byte = 'x'<br>Word 3 Lo byte = 'x'<br>Word 4 Hi byte = 'x'<br>Word 4 Lo byte = '\0' |
|             | IP Address           | 2 words   | 32 bits        | HEX                  | 0x0400          | 31025         | IP Address<br>Ex: IP = 192.168.1.1<br>Word 0 Hi byte = 0xC0<br>Word 0 Lo byte = 0xA8<br>Word 1 Hi byte = 0x01<br>Word 1 Lo byte = 0x01   |
| Port Info   | Port Status          | 1 word    | 16 bits        | HEX                  | 0x1000 ~ 0x101F | 34097 ~ 34128 | Port Status<br>0x0000: Link down<br>0x0001: Link up<br>0xFFFF: No port   |
|             | Port 1 Status        | 1 word    | 16 bits        | HEX                  | 0x1000          | 34097         |  |
|             | Port 2 Status        | 1 word    | 16 bits        | HEX                  | 0x1001          | 34098         |  |
|             | Port 3 Status        | 1 word    | 16 bits        | HEX                  | 0x1002          | 34099         |  |
|             | Port 4 Status        | 1 word    | 16 bits        | HEX                  | 0x1003          | 34100         |  |
|             | Port 5 Status        | 1 word    | 16 bits        | HEX                  | 0x1004          | 34101         |  |
|             | Port 6 Status        | 1 word    | 16 bits        | HEX                  | 0x1005          | 34102         |  |
|             | Port 7 Status        | 1 word    | 16 bits        | HEX                  | 0x1006          | 34103         |  |
|             | Port 8 Status        | 1 word    | 16 bits        | HEX                  | 0x1007          | 34104         |  |
|             | Port 9 Status        | 1 word    | 16 bits        | HEX                  | 0x1008          | 34105         |  |
|             | Port 10 Status       | 1 word    | 16 bits        | HEX                  | 0x1009          | 34106         |  |
|             | Port 11 Status       | 1 word    | 16 bits        | HEX                  | 0x100A          | 34107         |  |
|             | Port 12 Status       | 1 word    | 16 bits        | HEX                  | 0x100B          | 34108         |  |
|             | Port 13 Status       | 1 word    | 16 bits        | HEX                  | 0x100C          | 34109         |  |
|             | Port 14 Status       | 1 word    | 16 bits        | HEX                  | 0x100D          | 34110         |  |

| Catalog     | Name                 | Data Type | Interpretation | Address Offset (Hex) | Address 3X      | Description   |  |
|-------------|----------------------|-----------|----------------|----------------------|-----------------|---------------|--|
| System Info | Ethernet MAC Address | 3 words   | 48 bits        | HEX                  | 0x020E          | 30527         | Ethernet MAC Address<br>Ex: MAC = 00-19-CB-01-02-03<br>Word 0 Hi byte = 0x00<br>Word 0 Lo byte = 0x19<br>Word 1 Hi byte = 0xCB<br>Word 1 Lo byte = 0x01<br>Word 2 Hi byte = 0x02<br>Word 2 Lo byte = 0x03  |
|             | Revision Number      | 16 words  | 32 chars       | ASCII                | 0x0211          | 30530         | Product Name = "YYY.xxxxx"<br>Word 0 Hi byte = 'Y'<br>Word 0 Lo byte = 'Y'<br>Word 1 Hi byte = 'Y'<br>Word 1 Lo byte = '.'<br>Word 2 Hi byte = 'x'<br>Word 2 Lo byte = 'x'<br>Word 3 Hi byte = 'x'<br>Word 3 Lo byte = 'x'<br>Word 4 Hi byte = 'x'<br>Word 4 Lo byte = '0' |
|             | IP Address           | 2 words   | 32 bits        | HEX                  | 0x0400          | 31025         | IP Address<br>Ex: IP = 192.168.1.1<br>Word 0 Hi byte = 0xC0<br>Word 0 Lo byte = 0xA8<br>Word 1 Hi byte = 0x01<br>Word 1 Lo byte = 0x01   |
| Port Info   | Port Status          | 1 word    | 16 bits        | HEX                  | 0x1000 ~ 0x101F | 34097 ~ 34128 | Port Status<br>0x0000: Link down<br>0x0001: Link up<br>0xFFFF: No port   |
|             | Port 1 Status        | 1 word    | 16 bits        | HEX                  | 0x1000          | 34097         |  |
|             | Port 2 Status        | 1 word    | 16 bits        | HEX                  | 0x1001          | 34098         |  |
|             | Port 3 Status        | 1 word    | 16 bits        | HEX                  | 0x1002          | 34099         |  |
|             | Port 4 Status        | 1 word    | 16 bits        | HEX                  | 0x1003          | 34100         |  |
|             | Port 5 Status        | 1 word    | 16 bits        | HEX                  | 0x1004          | 34101         |  |
|             | Port 6 Status        | 1 word    | 16 bits        | HEX                  | 0x1005          | 34102         |  |
|             | Port 7 Status        | 1 word    | 16 bits        | HEX                  | 0x1006          | 34103         |  |
|             | Port 8 Status        | 1 word    | 16 bits        | HEX                  | 0x1007          | 34104         |  |
|             | Port 9 Status        | 1 word    | 16 bits        | HEX                  | 0x1008          | 34105         |  |
|             | Port 10 Status       | 1 word    | 16 bits        | HEX                  | 0x1009          | 34106         |  |
|             | Port 11 Status       | 1 word    | 16 bits        | HEX                  | 0x100A          | 34107         |  |
|             | Port 12 Status       | 1 word    | 16 bits        | HEX                  | 0x100B          | 34108         |  |
|             | Port 13 Status       | 1 word    | 16 bits        | HEX                  | 0x100C          | 34109         |  |
|             | Port 14 Status       | 1 word    | 16 bits        | HEX                  | 0x100D          | 34110         |  |

| Catelog       | Name           | Data Type | Interpretation | Address Offset (Hex) | Address 3X         | Description      |   |
|---------------|----------------|-----------|----------------|----------------------|--------------------|------------------|---|
| Port Info     | Port 15 Status | 1 word    | 16 bits        | HEX                  | 0x100E             | 34111            |   |
|               | Port 16 Status | 1 word    | 16 bits        | HEX                  | 0x100F             | 34112            |   |
|               | Port 17 Status | 1 word    | 16 bits        | HEX                  | 0x1010             | 34113            |   |
|               | Port 18 Status | 1 word    | 16 bits        | HEX                  | 0x1011             | 34114            |   |
|               | Port 19 Status | 1 word    | 16 bits        | HEX                  | 0x1012             | 34115            |   |
|               | Port 20 Status | 1 word    | 16 bits        | HEX                  | 0x1013             | 34116            |   |
|               | Port 21 Status | 1 word    | 16 bits        | HEX                  | 0x1014             | 34117            |   |
|               | Port 22 Status | 1 word    | 16 bits        | HEX                  | 0x1015             | 34118            |   |
|               | Port 23 Status | 1 word    | 16 bits        | HEX                  | 0x1016             | 34119            |   |
|               | Port 24 Status | 1 word    | 16 bits        | HEX                  | 0x1017             | 34120            |   |
|               | Port 25 Status | 1 word    | 16 bits        | HEX                  | 0x1018             | 34121            |   |
|               | Port 26 Status | 1 word    | 16 bits        | HEX                  | 0x1019             | 34122            |   |
|               | Port 27 Status | 1 word    | 16 bits        | HEX                  | 0x101A             | 34123            |   |
|               | Port 28 Status | 1 word    | 16 bits        | HEX                  | 0x101B             | 34124            |   |
|               | Port 29 Status | 1 word    | 16 bits        | HEX                  | 0x101C             | 34125            |   |
|               | Port 30 Status | 1 word    | 16 bits        | HEX                  | 0x101D             | 34126            |   |
|               | Port 31 Status | 1 word    | 16 bits        | HEX                  | 0x101E             | 34127            |   |
|               | Port 32 Status | 1 word    | 16 bits        | HEX                  | 0x101F             | 34128            |   |
|               | Port Speed     | 1 word    | 16 bits        | HEX                  | 0x1100 ~<br>0x111F | 34353 ~<br>34384 | Port Speed<br>0x0000: 10M-Half<br>0x0001: 10M-Full<br>0x0002: 100M-Half<br>0x0003: 100M-Full<br>0x0004: 1000M-Half<br>0x0005: 1000M-Full<br>0xFFFF: No port |
|               | Port 1 Speed   | 1 word    | 16 bits        | HEX                  | 0x1100             | 34353            |   |
|               | Port 2 Speed   | 1 word    | 16 bits        | HEX                  | 0x1101             | 34354            |   |
|               | Port 3 Speed   | 1 word    | 16 bits        | HEX                  | 0x1102             | 34355            |   |
|               | Port 4 Speed   | 1 word    | 16 bits        | HEX                  | 0x1103             | 34356            |   |
|               | Port 5 Speed   | 1 word    | 16 bits        | HEX                  | 0x1104             | 34357            |   |
|               | Port 6 Speed   | 1 word    | 16 bits        | HEX                  | 0x1105             | 34358            |   |
|               | Port 7 Speed   | 1 word    | 16 bits        | HEX                  | 0x1106             | 34359            |   |
|               | Port 8 Speed   | 1 word    | 16 bits        | HEX                  | 0x1107             | 34360            |   |
|               | Port 9 Speed   | 1 word    | 16 bits        | HEX                  | 0x1108             | 34361            |   |
|               | Port 10 Speed  | 1 word    | 16 bits        | HEX                  | 0x1109             | 34362            |   |
|               | Port 11 Speed  | 1 word    | 16 bits        | HEX                  | 0x110A             | 34363            |   |
|               | Port 12 Speed  | 1 word    | 16 bits        | HEX                  | 0x110B             | 34364            |   |
|               | Port 13 Speed  | 1 word    | 16 bits        | HEX                  | 0x110C             | 34365            |   |
|               | Port 14 Speed  | 1 word    | 16 bits        | HEX                  | 0x110D             | 34366            |   |
| Port 15 Speed | 1 word         | 16 bits   | HEX            | 0x110E               | 34367              |                  |   |
| Port 16 Speed | 1 word         | 16 bits   | HEX            | 0x110F               | 34368              |                  |   |
| Port 17 Speed | 1 word         | 16 bits   | HEX            | 0x1110               | 34369              |                  |   |
| Port 18 Speed | 1 word         | 16 bits   | HEX            | 0x1111               | 34370              |                  |   |
| Port 19 Speed | 1 word         | 16 bits   | HEX            | 0x1112               | 34371              |                  |   |
| Port 20 Speed | 1 word         | 16 bits   | HEX            | 0x1113               | 34372              |                  |   |
| Port 21 Speed | 1 word         | 16 bits   | HEX            | 0x1114               | 34373              |                  |   |
| Port 22 Speed | 1 word         | 16 bits   | HEX            | 0x1115               | 34374              |                  |   |
| Port 23 Speed | 1 word         | 16 bits   | HEX            | 0x1116               | 34375              |                  |   |
| Port 24 Speed | 1 word         | 16 bits   | HEX            | 0x1117               | 34376              |                  |   |
| Port 25 Speed | 1 word         | 16 bits   | HEX            | 0x1118               | 34377              |                  |   |
| Port 26 Speed | 1 word         | 16 bits   | HEX            | 0x1119               | 34378              |                  |   |
| Port 27 Speed | 1 word         | 16 bits   | HEX            | 0x111A               | 34379              |                  |   |

| Catalog     | Name                 | Data Type | Interpretation | Address Offset (Hex) | Address 3X      | Description   |   |
|-------------|----------------------|-----------|----------------|----------------------|-----------------|---------------|---|
| System Info | Ethernet MAC Address | 3 words   | 48 bits        | HEX                  | 0x020E          | 30527         | Ethernet MAC Address<br>Ex: MAC = 00-19-CB-01-02-03<br>Word 0 Hi byte = 0x00<br>Word 0 Lo byte = 0x19<br>Word 1 Hi byte = 0xCB<br>Word 1 Lo byte = 0x01<br>Word 2 Hi byte = 0x02<br>Word 2 Lo byte = 0x03   |
|             | Revision Number      | 16 words  | 32 chars       | ASCII                | 0x0211          | 30530         | Product Name = "YYY.xxxxx"<br>Word 0 Hi byte = 'Y'<br>Word 0 Lo byte = 'Y'<br>Word 1 Hi byte = 'Y'<br>Word 1 Lo byte = '.'<br>Word 2 Hi byte = 'x'<br>Word 2 Lo byte = 'x'<br>Word 3 Hi byte = 'x'<br>Word 3 Lo byte = 'x'<br>Word 4 Hi byte = 'x'<br>Word 4 Lo byte = '\0' |
|             | IP Address           | 2 words   | 32 bits        | HEX                  | 0x0400          | 31025         | IP Address<br>Ex: IP = 192.168.1.1<br>Word 0 Hi byte = 0xC0<br>Word 0 Lo byte = 0xA8<br>Word 1 Hi byte = 0x01<br>Word 1 Lo byte = 0x01  |
| Port Info   | Port Status          | 1 word    | 16 bits        | HEX                  | 0x1000 ~ 0x101F | 34097 ~ 34128 | Port Status<br>0x0000: Link down<br>0x0001: Link up<br>0xFFFF: No port  |
|             | Port 1 Status        | 1 word    | 16 bits        | HEX                  | 0x1000          | 34097         |   |
|             | Port 2 Status        | 1 word    | 16 bits        | HEX                  | 0x1001          | 34098         |   |
|             | Port 3 Status        | 1 word    | 16 bits        | HEX                  | 0x1002          | 34099         |   |
|             | Port 4 Status        | 1 word    | 16 bits        | HEX                  | 0x1003          | 34100         |   |
|             | Port 5 Status        | 1 word    | 16 bits        | HEX                  | 0x1004          | 34101         |   |
|             | Port 6 Status        | 1 word    | 16 bits        | HEX                  | 0x1005          | 34102         |   |
|             | Port 7 Status        | 1 word    | 16 bits        | HEX                  | 0x1006          | 34103         |   |
|             | Port 8 Status        | 1 word    | 16 bits        | HEX                  | 0x1007          | 34104         |   |
|             | Port 9 Status        | 1 word    | 16 bits        | HEX                  | 0x1008          | 34105         |   |
|             | Port 10 Status       | 1 word    | 16 bits        | HEX                  | 0x1009          | 34106         |   |
|             | Port 11 Status       | 1 word    | 16 bits        | HEX                  | 0x100A          | 34107         |   |
|             | Port 12 Status       | 1 word    | 16 bits        | HEX                  | 0x100B          | 34108         |   |
|             | Port 13 Status       | 1 word    | 16 bits        | HEX                  | 0x100C          | 34109         |   |
|             | Port 14 Status       | 1 word    | 16 bits        | HEX                  | 0x100D          | 34110         |   |



| Catalog       | Name           | Data Type | Interpretation | Address Offset (Hex) | Address 3X         | Description      |   |
|---------------|----------------|-----------|----------------|----------------------|--------------------|------------------|---|
| Port Info     | Port 15 Status | 1 word    | 16 bits        | HEX                  | 0x100E             | 34111            |   |
|               | Port 16 Status | 1 word    | 16 bits        | HEX                  | 0x100F             | 34112            |   |
|               | Port 17 Status | 1 word    | 16 bits        | HEX                  | 0x1010             | 34113            |   |
|               | Port 18 Status | 1 word    | 16 bits        | HEX                  | 0x1011             | 34114            |   |
|               | Port 19 Status | 1 word    | 16 bits        | HEX                  | 0x1012             | 34115            |   |
|               | Port 20 Status | 1 word    | 16 bits        | HEX                  | 0x1013             | 34116            |   |
|               | Port 21 Status | 1 word    | 16 bits        | HEX                  | 0x1014             | 34117            |   |
|               | Port 22 Status | 1 word    | 16 bits        | HEX                  | 0x1015             | 34118            |   |
|               | Port 23 Status | 1 word    | 16 bits        | HEX                  | 0x1016             | 34119            |   |
|               | Port 24 Status | 1 word    | 16 bits        | HEX                  | 0x1017             | 34120            |   |
|               | Port 25 Status | 1 word    | 16 bits        | HEX                  | 0x1018             | 34121            |   |
|               | Port 26 Status | 1 word    | 16 bits        | HEX                  | 0x1019             | 34122            |   |
|               | Port 27 Status | 1 word    | 16 bits        | HEX                  | 0x101A             | 34123            |   |
|               | Port 28 Status | 1 word    | 16 bits        | HEX                  | 0x101B             | 34124            |   |
|               | Port 29 Status | 1 word    | 16 bits        | HEX                  | 0x101C             | 34125            |   |
|               | Port 30 Status | 1 word    | 16 bits        | HEX                  | 0x101D             | 34126            |   |
|               | Port 31 Status | 1 word    | 16 bits        | HEX                  | 0x101E             | 34127            |   |
|               | Port 32 Status | 1 word    | 16 bits        | HEX                  | 0x101F             | 34128            |   |
|               | Port Speed     | 1 word    | 16 bits        | HEX                  | 0x1100 ~<br>0x111F | 34353 ~<br>34384 | Port Speed<br>0x0000: 10M-Half<br>0x0001: 10M-Full<br>0x0002: 100M-Half<br>0x0003: 100M-Full<br>0x0004: 1000M-Half<br>0x0005: 1000M-Full<br>0xFFFF: No port |
|               | Port 1 Speed   | 1 word    | 16 bits        | HEX                  | 0x1100             | 34353            |   |
|               | Port 2 Speed   | 1 word    | 16 bits        | HEX                  | 0x1101             | 34354            |   |
|               | Port 3 Speed   | 1 word    | 16 bits        | HEX                  | 0x1102             | 34355            |   |
|               | Port 4 Speed   | 1 word    | 16 bits        | HEX                  | 0x1103             | 34356            |   |
|               | Port 5 Speed   | 1 word    | 16 bits        | HEX                  | 0x1104             | 34357            |   |
|               | Port 6 Speed   | 1 word    | 16 bits        | HEX                  | 0x1105             | 34358            |   |
|               | Port 7 Speed   | 1 word    | 16 bits        | HEX                  | 0x1106             | 34359            |   |
|               | Port 8 Speed   | 1 word    | 16 bits        | HEX                  | 0x1107             | 34360            |   |
|               | Port 9 Speed   | 1 word    | 16 bits        | HEX                  | 0x1108             | 34361            |   |
|               | Port 10 Speed  | 1 word    | 16 bits        | HEX                  | 0x1109             | 34362            |   |
|               | Port 11 Speed  | 1 word    | 16 bits        | HEX                  | 0x110A             | 34363            |   |
|               | Port 12 Speed  | 1 word    | 16 bits        | HEX                  | 0x110B             | 34364            |   |
|               | Port 13 Speed  | 1 word    | 16 bits        | HEX                  | 0x110C             | 34365            |   |
|               | Port 14 Speed  | 1 word    | 16 bits        | HEX                  | 0x110D             | 34366            |   |
| Port 15 Speed | 1 word         | 16 bits   | HEX            | 0x110E               | 34367              |                  |   |
| Port 16 Speed | 1 word         | 16 bits   | HEX            | 0x110F               | 34368              |                  |   |
| Port 17 Speed | 1 word         | 16 bits   | HEX            | 0x1110               | 34369              |                  |   |
| Port 18 Speed | 1 word         | 16 bits   | HEX            | 0x1111               | 34370              |                  |   |
| Port 19 Speed | 1 word         | 16 bits   | HEX            | 0x1112               | 34371              |                  |   |
| Port 20 Speed | 1 word         | 16 bits   | HEX            | 0x1113               | 34372              |                  |   |
| Port 21 Speed | 1 word         | 16 bits   | HEX            | 0x1114               | 34373              |                  |   |
| Port 22 Speed | 1 word         | 16 bits   | HEX            | 0x1115               | 34374              |                  |   |
| Port 23 Speed | 1 word         | 16 bits   | HEX            | 0x1116               | 34375              |                  |   |
| Port 24 Speed | 1 word         | 16 bits   | HEX            | 0x1117               | 34376              |                  |   |
| Port 25 Speed | 1 word         | 16 bits   | HEX            | 0x1118               | 34377              |                  |   |
| Port 26 Speed | 1 word         | 16 bits   | HEX            | 0x1119               | 34378              |                  |   |
| Port 27 Speed | 1 word         | 16 bits   | HEX            | 0x111A               | 34379              |                  |   |

| Catalog              | Name                 | Data Type | Interpretation | Address Offset (Hex) | Address 3X         | Description      |  |
|----------------------|----------------------|-----------|----------------|----------------------|--------------------|------------------|--|
| Port Info            | Port 28 Speed        | 1 word    | 16 bits        | HEX                  | 0x111B             | 34380            |  |
|                      | Port 29 Speed        | 1 word    | 16 bits        | HEX                  | 0x111C             | 34381            |  |
|                      | Port 30 Speed        | 1 word    | 16 bits        | HEX                  | 0x111D             | 34382            |  |
|                      | Port 31 Speed        | 1 word    | 16 bits        | HEX                  | 0x111E             | 34383            |  |
|                      | Port 32 Speed        | 1 word    | 16 bits        | HEX                  | 0x111F             | 34384            |  |
|                      | Flow Control         | 1 word    | 16 bits        | HEX                  | 0x1200 ~<br>0x121F | 34609 ~<br>34640 | Flow Control<br>0x0000: Off<br>0x0001: On<br>0xFFFF: No port |
|                      | Port 1 Flow Control  | 1 word    | 16 bits        | HEX                  | 0x1200             | 34609            |  |
|                      | Port 2 Flow Control  | 1 word    | 16 bits        | HEX                  | 0x1201             | 34610            |  |
|                      | Port 3 Flow Control  | 1 word    | 16 bits        | HEX                  | 0x1202             | 34611            |  |
|                      | Port 4 Flow Control  | 1 word    | 16 bits        | HEX                  | 0x1203             | 34612            |  |
|                      | Port 5 Flow Control  | 1 word    | 16 bits        | HEX                  | 0x1204             | 34613            |  |
|                      | Port 6 Flow Control  | 1 word    | 16 bits        | HEX                  | 0x1205             | 34614            |  |
|                      | Port 7 Flow Control  | 1 word    | 16 bits        | HEX                  | 0x1206             | 34615            |  |
|                      | Port 8 Flow Control  | 1 word    | 16 bits        | HEX                  | 0x1207             | 34616            |  |
|                      | Port 9 Flow Control  | 1 word    | 16 bits        | HEX                  | 0x1208             | 34617            |  |
|                      | Port 10 Flow Control | 1 word    | 16 bits        | HEX                  | 0x1209             | 34618            |  |
|                      | Port 11 Flow Control | 1 word    | 16 bits        | HEX                  | 0x120A             | 34619            |  |
|                      | Port 12 Flow Control | 1 word    | 16 bits        | HEX                  | 0x120B             | 34620            |  |
|                      | Port 13 Flow Control | 1 word    | 16 bits        | HEX                  | 0x120C             | 34621            |  |
|                      | Port 14 Flow Control | 1 word    | 16 bits        | HEX                  | 0x120D             | 34622            |  |
|                      | Port 15 Flow Control | 1 word    | 16 bits        | HEX                  | 0x120E             | 34623            |  |
|                      | Port 16 Flow Control | 1 word    | 16 bits        | HEX                  | 0x120F             | 34624            |  |
|                      | Port 17 Flow Control | 1 word    | 16 bits        | HEX                  | 0x1210             | 34625            |  |
|                      | Port 18 Flow Control | 1 word    | 16 bits        | HEX                  | 0x1211             | 34626            |  |
|                      | Port 19 Flow Control | 1 word    | 16 bits        | HEX                  | 0x1212             | 34627            |  |
|                      | Port 20 Flow Control | 1 word    | 16 bits        | HEX                  | 0x1213             | 34628            |  |
|                      | Port 21 Flow Control | 1 word    | 16 bits        | HEX                  | 0x1214             | 34629            |  |
| Port 22 Flow Control | 1 word               | 16 bits   | HEX            | 0x1215               | 34630              |                  |  |
| Port 23 Flow Control | 1 word               | 16 bits   | HEX            | 0x1216               | 34631              |                  |  |
| Port 24 Flow Control | 1 word               | 16 bits   | HEX            | 0x1217               | 34632              |                  |  |
| Port 25 Flow Control | 1 word               | 16 bits   | HEX            | 0x1218               | 34633              |                  |  |

| Catalog             | Name                 | Data Type | Interpretation | Address Offset (Hex) | Address 3X    | Description   |
|---------------------|----------------------|-----------|----------------|----------------------|---------------|---|
| Port Info           | Port 26 Flow Control | 1 word    | 16 bits        | HEX                  | 0x1219        | 34634   |
|                     | Port 27 Flow Control | 1 word    | 16 bits        | HEX                  | 0x121A        | 34635   |
|                     | Port 28 Flow Control | 1 word    | 16 bits        | HEX                  | 0x121B        | 34636   |
|                     | Port 29 Flow Control | 1 word    | 16 bits        | HEX                  | 0x121C        | 34637   |
|                     | Port 30 Flow Control | 1 word    | 16 bits        | HEX                  | 0x121D        | 34638   |
|                     | Port 31 Flow Control | 1 word    | 16 bits        | HEX                  | 0x121E        | 34639   |
|                     | Port 32 Flow Control | 1 word    | 16 bits        | HEX                  | 0x121F        | 34640   |
| Port Description    | 20 words             | 40 chars  | ASCII          | 0x1400 ~ 0x166C      | 35121 ~ 35741 | Port Description<br>Port Description = "100RX,RJ45."<br>Word 0 Hi byte = '1'<br>Word 0 Lo byte = '0'<br>Word 1 Hi byte = '0'<br>Word 1 Lo byte = 'R'<br>Word 2 Hi byte = 'X'<br>Word 2 Lo byte = ','<br>Word 3 Hi byte = 'R'<br>Word 3 Lo byte = 'J'<br>Word 4 Hi byte = '4'<br>Word 4 Lo byte = '5'<br>Word 5 Hi byte = '.'<br>Word 5 Lo byte = '\0' |
| Port 1 Description  | 20 words             | 40 chars  | ASCII          | 0x1400               | 35121         |   |
| Port 2 Description  | 20 words             | 40 chars  | ASCII          | 0x1414               | 35141         |   |
| Port 3 Description  | 20 words             | 40 chars  | ASCII          | 0x1428               | 35161         |   |
| Port 4 Description  | 20 words             | 40 chars  | ASCII          | 0x143C               | 35181         |   |
| Port 5 Description  | 20 words             | 40 chars  | ASCII          | 0x1450               | 35201         |   |
| Port 6 Description  | 20 words             | 40 chars  | ASCII          | 0x1464               | 35221         |   |
| Port 7 Description  | 20 words             | 40 chars  | ASCII          | 0x1478               | 35241         |   |
| Port 8 Description  | 20 words             | 40 chars  | ASCII          | 0x148C               | 35261         |   |
| Port 9 Description  | 20 words             | 40 chars  | ASCII          | 0x14A0               | 35281         |   |
| Port 10 Description | 20 words             | 40 chars  | ASCII          | 0x14B4               | 35301         |   |
| Port 11 Description | 20 words             | 40 chars  | ASCII          | 0x14C8               | 35321         |   |
| Port 12 Description | 20 words             | 40 chars  | ASCII          | 0x14DC               | 35341         |   |
| Port 13 Description | 20 words             | 40 chars  | ASCII          | 0x14F0               | 35361         |   |
| Port 14 Description | 20 words             | 40 chars  | ASCII          | 0x1504               | 35381         |   |

| Catalog   | Name                   | Data Type | Interpretation | Address Offset (Hex) | Address 3X      | Description   |  |
|-----------|------------------------|-----------|----------------|----------------------|-----------------|---------------|--|
| Port Info | Port 15 Description    | 20 words  | 40 chars       | ASCII                | 0x1518          | 35401         |  |
|           | Port 16 Description    | 20 words  | 40 chars       | ASCII                | 0x152C          | 35421         |  |
|           | Port 17 Description    | 20 words  | 40 chars       | ASCII                | 0x1540          | 35441         |  |
|           | Port 18 Description    | 20 words  | 40 chars       | ASCII                | 0x1554          | 35461         |  |
|           | Port 19 Description    | 20 words  | 40 chars       | ASCII                | 0x1568          | 35481         |  |
|           | Port 20 Description    | 20 words  | 40 chars       | ASCII                | 0x157C          | 35501         |  |
|           | Port 21 Description    | 20 words  | 40 chars       | ASCII                | 0x1590          | 35521         |  |
|           | Port 22 Description    | 20 words  | 40 chars       | ASCII                | 0x15A4          | 35541         |  |
|           | Port 23 Description    | 20 words  | 40 chars       | ASCII                | 0x15B8          | 35561         |  |
|           | Port 24 Description    | 20 words  | 40 chars       | ASCII                | 0x15CC          | 35581         |  |
|           | Port 25 Description    | 20 words  | 40 chars       | ASCII                | 0x15E0          | 35601         |  |
|           | Port 26 Description    | 20 words  | 40 chars       | ASCII                | 0x15F4          | 35621         |  |
|           | Port 27 Description    | 20 words  | 40 chars       | ASCII                | 0x1608          | 35641         |  |
|           | Port 28 Description    | 20 words  | 40 chars       | ASCII                | 0x161C          | 35661         |  |
|           | Port 29 Description    | 20 words  | 40 chars       | ASCII                | 0x1630          | 35681         |  |
|           | Port 30 Description    | 20 words  | 40 chars       | ASCII                | 0x1644          | 35701         |  |
|           | Port 31 Description    | 20 words  | 40 chars       | ASCII                | 0x1658          | 35721         |  |
|           | Port 32 Description    | 20 words  | 40 chars       | ASCII                | 0x166C          | 35741         |  |
|           | Link Up Counter        | 1 word    | 16 bits        | HEX                  | 0x1700 ~ 0x171F | 35889 ~ 35920 | Link Up Counter<br>Ex: port link up counter = 13<br>Received MODBUS response: 0x000D |
|           | Port 1 Link Up Counter | 1 word    | 16 bits        | HEX                  | 0x1700          | 35889         |  |
|           | Port 2 Link Up Counter | 1 word    | 16 bits        | HEX                  | 0x1701          | 35890         |  |
|           | Port 3 Link Up Counter | 1 word    | 16 bits        | HEX                  | 0x1702          | 35891         |  |
|           | Port 4 Link Up Counter | 1 word    | 16 bits        | HEX                  | 0x1703          | 35892         |  |
|           | Port 5 Link Up Counter | 1 word    | 16 bits        | HEX                  | 0x1704          | 35893         |  |
|           | Port 6 Link Up Counter | 1 word    | 16 bits        | HEX                  | 0x1705          | 35894         |  |
|           | Port 7 Link Up Counter | 1 word    | 16 bits        | HEX                  | 0x1706          | 35895         |  |
|           | Port 8 Link Up Counter | 1 word    | 16 bits        | HEX                  | 0x1707          | 35896         |  |
|           | Port 9 Link Up Counter | 1 word    | 16 bits        | HEX                  | 0x1708          | 35897         |  |

| Catalog   | Name                    | Data Type          | Interpretation | Address Offset (Hex) | Address 3X | Description     |               |  |
|-----------|-------------------------|--------------------|----------------|----------------------|------------|-----------------|---------------|--|
| Port Info | Port 10 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x1709     | 35898           |               |  |
|           | Port 11 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x170A     | 35899           |               |  |
|           | Port 12 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x170B     | 35900           |               |  |
|           | Port 13 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x170C     | 35901           |               |  |
|           | Port 14 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x170D     | 35902           |               |  |
|           | Port 15 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x170E     | 35903           |               |  |
|           | Port 16 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x170F     | 35904           |               |  |
|           | Port 17 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x1710     | 35905           |               |  |
|           | Port 18 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x1711     | 35906           |               |  |
|           | Port 19 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x1712     | 35907           |               |  |
|           | Port 20 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x1713     | 35908           |               |  |
|           | Port 21 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x1714     | 35909           |               |  |
|           | Port 22 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x1715     | 35910           |               |  |
|           | Port 23 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x1716     | 35911           |               |  |
|           | Port 24 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x1717     | 35912           |               |  |
|           | Port 25 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x1718     | 35913           |               |  |
|           | Port 26 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x1719     | 35914           |               |  |
|           | Port 27 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x171A     | 35915           |               |  |
|           | Port 28 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x171B     | 35916           |               |  |
|           | Port 29 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x171C     | 35917           |               |  |
|           | Port 30 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x171D     | 35918           |               |  |
|           | Port 31 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x171E     | 35919           |               |  |
|           | Port 32 Link Up Counter | 1 word             | 16 bits        | HEX                  | 0x171F     | 35920           |               |  |
|           | Packet Info             | Tx Packets Counter | 4 words        | 64 bits              | HEX        | 0x2000 ~ 0x207C | 38193 ~ 38317 | Tx Packets<br>Ex: port 1 Tx Packet Amount = 11223344<br>Received MODBUS response: 0xAB4130<br>Word 0 = 0x0000<br>Word 1 = 0x0000<br>Word 2 = 0x00AB<br>Word 3 = 0x4130 |
|           |                         | Port 1 Tx Packets  | 4 words        | 64 bits              | HEX        | 0x2000          | 38193         |  |
|           |                         | Port 2 Tx Packets  | 4 words        | 64 bits              | HEX        | 0x2004          | 38197         |  |

| Catalog     | Name               | Data Type | Interpretation | Address Offset (Hex) | Address 3X | Description |
|-------------|--------------------|-----------|----------------|----------------------|------------|-------------|
| Packet Info | Port 3 Tx Packets  | 4 words   | 64 bits        | HEX                  | 0x2008     | 38201       |
|             | Port 4 Tx Packets  | 4 words   | 64 bits        | HEX                  | 0x200C     | 38205       |
|             | Port 5 Tx Packets  | 4 words   | 64 bits        | HEX                  | 0x2010     | 38209       |
|             | Port 6 Tx Packets  | 4 words   | 64 bits        | HEX                  | 0x2014     | 38213       |
|             | Port 7 Tx Packets  | 4 words   | 64 bits        | HEX                  | 0x2018     | 38217       |
|             | Port 8 Tx Packets  | 4 words   | 64 bits        | HEX                  | 0x201C     | 38221       |
|             | Port 9 Tx Packets  | 4 words   | 64 bits        | HEX                  | 0x2020     | 38225       |
|             | Port 10 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2024     | 38229       |
|             | Port 11 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2028     | 38233       |
|             | Port 12 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x202C     | 38237       |
|             | Port 13 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2030     | 38241       |
|             | Port 14 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2034     | 38245       |
|             | Port 15 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2038     | 38249       |
|             | Port 16 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x203C     | 38253       |
|             | Port 17 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2040     | 38257       |
|             | Port 18 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2044     | 38261       |
|             | Port 19 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2048     | 38265       |
|             | Port 20 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x204C     | 38269       |
|             | Port 21 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2050     | 38273       |
|             | Port 22 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2054     | 38277       |
|             | Port 23 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2058     | 38281       |
|             | Port 24 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x205C     | 38285       |
|             | Port 25 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2060     | 38289       |
|             | Port 26 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2064     | 38293       |
|             | Port 27 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2068     | 38297       |
|             | Port 28 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x206C     | 38301       |
|             | Port 29 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2070     | 38305       |
|             | Port 30 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2074     | 38309       |
|             | Port 31 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x2078     | 38313       |
|             | Port 32 Tx Packets | 4 words   | 64 bits        | HEX                  | 0x207C     | 38317       |

| Catalog     | Name               | Data Type | Interpretation | Address Offset (Hex) | Address 3X     | Description   |  |
|-------------|--------------------|-----------|----------------|----------------------|----------------|---------------|--|
| Packet Info | Rx Packets Counter | 4 words   | 64 bits        | HEX                  | 0x2100 ~0x217C | 38449 ~ 38573 | Rx Packets<br>Ex: port 1 Rx Packet Amount = 11223344<br>Received MODBUS response: 0xAB4130<br>Word 0 = 0x0000<br>Word 1 = 0x0000<br>Word 2 = 0x00AB<br>Word 3 = 0x4130 |
|             | Port 1 Rx Packets  | 4 words   | 64 bits        | HEX                  | 0x2100         | 38449         |  |
|             | Port 2 Rx Packets  | 4 words   | 64 bits        | HEX                  | 0x2104         | 38453         |  |
|             | Port 3 Rx Packets  | 4 words   | 64 bits        | HEX                  | 0x2108         | 38457         |  |
|             | Port 4 Rx Packets  | 4 words   | 64 bits        | HEX                  | 0x210C         | 38461         |  |
|             | Port 5 Rx Packets  | 4 words   | 64 bits        | HEX                  | 0x2110         | 38465         |  |
|             | Port 6 Rx Packets  | 4 words   | 64 bits        | HEX                  | 0x2114         | 38469         |  |
|             | Port 7 Rx Packets  | 4 words   | 64 bits        | HEX                  | 0x2118         | 38473         |  |
|             | Port 8 Rx Packets  | 4 words   | 64 bits        | HEX                  | 0x211C         | 38477         |  |
|             | Port 9 Rx Packets  | 4 words   | 64 bits        | HEX                  | 0x2120         | 38481         |  |
|             | Port 10 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2124         | 38485         |  |
|             | Port 11 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2128         | 38489         |  |
|             | Port 12 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x212C         | 38493         |  |
|             | Port 13 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2130         | 38497         |  |
|             | Port 14 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2134         | 38501         |  |
|             | Port 15 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2138         | 38505         |  |
|             | Port 16 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x213C         | 38509         |  |
|             | Port 17 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2140         | 38513         |  |
|             | Port 18 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2144         | 38517         |  |
|             | Port 19 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2148         | 38521         |  |
|             | Port 20 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x214C         | 38525         |  |
|             | Port 21 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2150         | 38529         |  |
|             | Port 22 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2154         | 38533         |  |
|             | Port 23 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2158         | 38537         |  |
|             | Port 24 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x215C         | 38541         |  |
|             | Port 25 Rx Packets | 4 words   | 64 bits        | HEX                  | 0x2160         | 38545         |  |

| Catalog                  | Name                     | Data Type | Interpretation | Address Offset (Hex) | Address 3X      | Description   |  |
|--------------------------|--------------------------|-----------|----------------|----------------------|-----------------|---------------|--|
| Packet Info              | Port 26 Rx Packets       | 4 words   | 64 bits        | HEX                  | 0x2164          | 38549         |  |
|                          | Port 27 Rx Packets       | 4 words   | 64 bits        | HEX                  | 0x2168          | 38553         |  |
|                          | Port 28 Rx Packets       | 4 words   | 64 bits        | HEX                  | 0x216C          | 38557         |  |
|                          | Port 29 Rx Packets       | 4 words   | 64 bits        | HEX                  | 0x2170          | 38561         |  |
|                          | Port 30 Rx Packets       | 4 words   | 64 bits        | HEX                  | 0x2174          | 38565         |  |
|                          | Port 31 Rx Packets       | 4 words   | 64 bits        | HEX                  | 0x2178          | 38569         |  |
|                          | Port 32 Rx Packets       | 4 words   | 64 bits        | HEX                  | 0x217C          | 38573         |  |
|                          | Tx Error Packets Counter | 2 words   | 32 bits        | HEX                  | 0x2200 ~ 0x223E | 38705 ~ 38767 | Tx Error Packets<br>Ex: port 1 Tx Packet Amount = 11223344<br>Received MODBUS response: 0xAB4130<br>Word 0 = 0x00AB<br>Word 1 = 0x4130 |
|                          | Port 1 Tx Error Packets  | 2 words   | 32 bits        | HEX                  | 0x2200          | 38705         |  |
|                          | Port 2 Tx Error Packets  | 2 words   | 32 bits        | HEX                  | 0x2202          | 38707         |  |
|                          | Port 3 Tx Error Packets  | 2 words   | 32 bits        | HEX                  | 0x2204          | 38709         |  |
|                          | Port 4 Tx Error Packets  | 2 words   | 32 bits        | HEX                  | 0x2206          | 38711         |  |
|                          | Port 5 Tx Error Packets  | 2 words   | 32 bits        | HEX                  | 0x2208          | 38713         |  |
|                          | Port 6 Tx Error Packets  | 2 words   | 32 bits        | HEX                  | 0x220A          | 38715         |  |
|                          | Port 7 Tx Error Packets  | 2 words   | 32 bits        | HEX                  | 0x220C          | 38717         |  |
|                          | Port 8 Tx Error Packets  | 2 words   | 32 bits        | HEX                  | 0x220E          | 38719         |  |
|                          | Port 9 Tx Error Packets  | 2 words   | 32 bits        | HEX                  | 0x2210          | 38721         |  |
|                          | Port 10 Tx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2212          | 38723         |  |
|                          | Port 11 Tx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2214          | 38725         |  |
|                          | Port 12 Tx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2216          | 38727         |  |
|                          | Port 13 Tx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2218          | 38729         |  |
|                          | Port 14 Tx Error Packets | 2 words   | 32 bits        | HEX                  | 0x221A          | 38731         |  |
|                          | Port 15 Tx Error Packets | 2 words   | 32 bits        | HEX                  | 0x221C          | 38733         |  |
|                          | Port 16 Tx Error Packets | 2 words   | 32 bits        | HEX                  | 0x221E          | 38735         |  |
|                          | Port 17 Tx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2220          | 38737         |  |
| Port 18 Tx Error Packets | 2 words                  | 32 bits   | HEX            | 0x2222               | 38739           |               |  |
| Port 19 Tx Error Packets | 2 words                  | 32 bits   | HEX            | 0x2224               | 38741           |               |  |



| Catalog                  | Name                     | Data Type |         | Interpretation | Address Offset (Hex) | Address 3X    | Description  |
|--------------------------|--------------------------|-----------|---------|----------------|----------------------|---------------|--|
| Packet Info              | Port 20 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x2226               | 38743         |  |
|                          | Port 21 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x2228               | 38745         |  |
|                          | Port 22 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x222A               | 38747         |  |
|                          | Port 23 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x222C               | 38749         |  |
|                          | Port 24 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x222E               | 38751         |  |
|                          | Port 25 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x2230               | 38753         |  |
|                          | Port 26 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x2232               | 38755         |  |
|                          | Port 27 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x2234               | 38757         |  |
|                          | Port 28 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x2236               | 38759         |  |
|                          | Port 29 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x2238               | 38761         |  |
|                          | Port 30 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x223A               | 38763         |  |
|                          | Port 31 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x223C               | 38765         |  |
|                          | Port 32 Tx Error Packets | 2 words   | 32 bits | HEX            | 0x223E               | 38767         |  |
|                          | Rx Error Packets Counter | 2 words   | 32 bits | HEX            | 0x2300 ~ 0x233E      | 38961 ~ 39023 | Rx Error Packets<br>Ex: port 1 Rx Packet Amount = 11223344<br>Received MODBUS response: 0xAB4130<br>Word 0 = 0x00AB<br>Word 1 = 0x4130 |
|                          | Port 1 Rx Error Packets  | 2 words   | 32 bits | HEX            | 0x2300               | 38961         |  |
|                          | Port 2 Rx Error Packets  | 2 words   | 32 bits | HEX            | 0x2302               | 38963         |  |
|                          | Port 3 Rx Error Packets  | 2 words   | 32 bits | HEX            | 0x2304               | 38965         |  |
|                          | Port 4 Rx Error Packets  | 2 words   | 32 bits | HEX            | 0x2306               | 38967         |  |
|                          | Port 5 Rx Error Packets  | 2 words   | 32 bits | HEX            | 0x2308               | 38969         |  |
|                          | Port 6 Rx Error Packets  | 2 words   | 32 bits | HEX            | 0x230A               | 38971         |  |
| Port 7 Rx Error Packets  | 2 words                  | 32 bits   | HEX     | 0x230C         | 38973                |               |  |
| Port 8 Rx Error Packets  | 2 words                  | 32 bits   | HEX     | 0x230E         | 38975                |               |  |
| Port 9 Rx Error Packets  | 2 words                  | 32 bits   | HEX     | 0x2310         | 38977                |               |  |
| Port 10 Rx Error Packets | 2 words                  | 32 bits   | HEX     | 0x2312         | 38979                |               |  |
| Port 11 Rx Error Packets | 2 words                  | 32 bits   | HEX     | 0x2314         | 38981                |               |  |
| Port 12 Rx Error Packets | 2 words                  | 32 bits   | HEX     | 0x2316         | 38983                |               |  |
| Port 13 Rx Error Packets | 2 words                  | 32 bits   | HEX     | 0x2318         | 38985                |               |  |

| Catalog                  | Name                     | Data Type | Interpretation | Address Offset (Hex) | Address Description |
|--------------------------|--------------------------|-----------|----------------|----------------------|---------------------|
| Packet Info              | Port 14 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x231A 38987        |
|                          | Port 15 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x231C 38989        |
|                          | Port 16 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x231E 38991        |
|                          | Port 17 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2320 38993        |
|                          | Port 18 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2322 38995        |
|                          | Port 19 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2324 38997        |
|                          | Port 20 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2326 38999        |
|                          | Port 21 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2328 39001        |
|                          | Port 22 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x232A 39003        |
|                          | Port 23 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x232C 39005        |
|                          | Port 24 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x232E 39007        |
|                          | Port 25 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2330 39009        |
|                          | Port 26 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2332 39011        |
|                          | Port 27 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2334 39013        |
|                          | Port 28 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2336 39015        |
|                          | Port 29 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x2338 39017        |
|                          | Port 30 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x233A 39019        |
|                          | Port 31 Rx Error Packets | 2 words   | 32 bits        | HEX                  | 0x233C 39021        |
| Port 32 Rx Error Packets | 2 words                  | 32 bits   | HEX            | 0x233E 39023         |                     |

# ADVANTECH

*Enabling an Intelligent Planet*

[www.advantech.com](http://www.advantech.com)

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2018