



WAGO ETHERNET Accessories 852
7-Port 100BASE-TX + 2-Slot 100BASE-FX
Industrial Managed Switch
852-104
Assembly, Installation and Handling

Version 1.1.3

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Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

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We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present manual are generally protected by trademark or patent.

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1 Important Notes

This section includes an overall summary of the most important safety requirements and notes that are mentioned in each individual section. To protect your health and prevent damage to devices as well, it is imperative to read and carefully follow the safety guidelines.

1.1 Legal Bases

1.1.1 Subject to Changes

WAGO Kontakttechnik GmbH & Co. KG reserves the right to provide for any alterations or modifications that serve to increase the efficiency of technical progress. WAGO Kontakttechnik GmbH & Co. KG owns all rights arising from the granting of patents or from the legal protection of utility patents. Third-party products are always mentioned without any reference to patent rights. Thus, the existence of such rights cannot be excluded.

1.1.2 Personnel Qualification

All sequences implemented on Series 852 devices may only be carried out by electrical specialists with sufficient knowledge in automation. The specialists must be familiar with the current norms and guidelines for the devices and automated environments.

All changes to the controller should always be carried out by qualified personnel with sufficient sufficient skills in PLC programming.

1.1.3 Proper Use of the Industrial Switches

The device is designed for the IP30 protection class. It is protected against the insertion of solid items and solid impurities up to 2.5 mm in diameter, but not against water penetration. Unless otherwise specified, the device must not be operated in wet and dusty environments.

1.1.4 Technical Condition of Specified Devices

The components to be supplied Ex Works, are equipped with hardware and software configurations, which meet the individual application requirements. WAGO Kontakttechnik GmbH & Co. KG will be exempted from any liability in case of changes in hardware or software as well as to non-compliant usage of components.

Please send your request for modified and new hardware or software configurations directly to WAGO Kontakttechnik GmbH & Co. KG.

1.2 Standards and Regulations for Operating the Industrial Switches

Please observe the standards and regulations that are relevant to installation:

- The data and power lines must be connected and installed in compliance with the standards to avoid failures on your installation and eliminate any danger to personnel.
- For installation, startup, maintenance and repair, please observe the accident prevention regulations of your machine (e.g., BGV A 3, "Electrical Installations and Equipment").
- Emergency stop functions and equipment must not be deactivated or otherwise made ineffective. See relevant standards (e.g., DIN EN 418).
- Your installation must be equipped in accordance to the EMC guidelines so electromagnetic interferences can be eliminated.
- Please observe the safety measures against electrostatic discharge according to DIN EN 61340-5-1/-3. When handling the modules, ensure that environmental factors (persons, workplace and packing) are well grounded.
- The relevant valid and applicable standards and guidelines regarding the installation of switch cabinets must be observed.

1.3 Symbols

 **DANGER**

Personal Injury!

Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **DANGER**

Personal Injury Caused by Electric Current!

Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING**

Personal Injury!

Indicates a moderate-risk, potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION**

Personal Injury!

Indicates a low-risk, potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

Damage to Property!

Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

NOTICE

Damage to Property Caused by Electrostatic Discharge (ESD)!

Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

Note

Important Note!

Indicates a potential malfunction which, if not avoided, however, will not result in damage to property.



Information

Additional Information:

Refers to additional information which is not an integral part of this documentation (e.g., the Internet).

1.4 Safety Information

DANGER

Warning of physical injury

Industrial Switches are exposed operating equipment. They may only be assembled in housings, cabinets or in electrical operation rooms. Access is only permitted via a key or tool to authorized qualified personnel.

DANGER

Warning of physical injury

All power sources to the device must always be switched off before performing any installation, repair or maintenance work.



WARNING

Warning of physical Injury due to electric current

Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures.

It concerns here a laser class 1 according EN 60825-1.

NOTICE

Warning of damage to equipment

The components are not resistant against materials having seeping and insulating properties such as: aerosols, silicones, triglycerides (found in some hand creams). If it cannot be determined that these materials appear in the component environment, then the components must be installed in an enclosure that is resistant against the above mentioned materials. Clean tools and materials are generally required to operate the device/module.

NOTICE

Warning of damage to equipment

Soiled contacts must be cleaned using oil-free compressed air or with ethyl alcohol and leather cloths.

NOTICE

Warning of damage to equipment

Do not use contact sprays, which could possibly impair contact area functionality.

NOTICE**Warning of damage to equipment**

Avoid reverse polarity of data and power lines as this may damage the devices.

NOTICE**Warning of damage to equipment**

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

NOTICE**Warning of damage to equipment by electrostatic discharge**

The devices are equipped with electronic components that may be destroyed by electrostatic discharge when touched.

1.5 Font Conventions

Table 1: Font Conventions

Font type	Indicates
<i>italic</i>	Names of paths and data files are marked in italic-type. e.g.: <i>C:\Programme\WAGO-I/O-CHECK</i>
Menu	Menu items are marked in bold letters. e.g.: Save
>	A greater-than sign between two names means the selection of a menu item from a menu. e.g.: File > New
Input	Designation of input or optional fields are marked in bold letters, e.g.: Start of measurement range
“Value”	Input or selective values are marked in inverted commas. e.g.: Enter the value “4 mA” under Start of measurement range .
[Button]	Pushbuttons in dialog boxes are marked with bold letters in square brackets. e.g.: [Input]
[Key]	Keys are marked with bold letters in square brackets. e.g.: [F5]

1.6 Number Notation

Table 2: Number Notation

Number code	Example	Note
Decimal	100	Normal notation
Hexadecimal	0x64	C notation
Binary	'100' '0110.0100'	In quotation marks, nibble separated with dots (.)

2 General

2.1 Package Contents

- One Industrial Switch
- One console port cable (RJ-45 to DB9)
- DIN rail bracket
- Protective caps for unused ports

2.2 Industrial Ethernet Technology

The line of switches from WAGO ensure the scalability of your network infrastructure with outstanding electrical and mechanical characteristics. These robust devices are designed for industrial use and they are fully compliant with IEEE802.3, 802.3u.

They have function monitoring and redundant voltage supply with a supply voltage range of 9 ... 48 V. Alarm functions are enabled via DIP switch. Characteristics such as auto negotiation and auto MDI/MDIX (crossover) on all 10/100 BaseTX ports are also realized, as is a store-and-forward switching mode.

2.3 Switching Technology

Another approach to pushing beyond the limits of Ethernet technology is the development of switching technology. A switch bridges Ethernet packets at the MAC address level of the Ethernet protocol transmitting among connected Ethernet or Fast Ethernet LAN segments.

Switching is a cost-effective way of increasing the total network capacity available to users on a local area network. A switch increases capacity and decreases network loading by dividing a local area network into different segments, which don't compete with each other for network transmission capacity.

The Industrial Switch was designed for easy installation in an industrial environment where vibration, shock, heat, and RF interference may be commonplace.

The Industrial Switch, with its small, compact size, was specifically designed for easy DIN rail mounting and can be installed where space is limited.

The Industrial Switch is ideal for deployment with multiple high-speed servers for shared bandwidth 10 Mbps or 100 Mbps workgroups. With the highest bandwidth 200 Mbps (100 Mbps full duplex mode), any port can provide workstations with a congestion-free data pipe for simultaneous access to the server.

The Industrial Switch is expandable by cascading two or more switches together in a 'daisy-chain' fashion. As all ports support 200 Mbps, the Industrial Switch can be cascaded from any port and to any number of switches.

The Industrial Switch combines dynamic memory allocation with store-and-forward switching to ensure that the buffer is effectively allocated for each port, while controlling the data flow between the transmit and receive nodes to guarantee against all possible packet loss.

Other key features are:

- Seven (7) 10/100Base-TX, two (2) 100Base-FX (SFP type fiber transceivers) and One (1) Console port (RJ-45)
- Rugged metal-IP30 Case
- Vibration/Shock operational
- DIP switches to enable or disable alarm functions
- Under and over-power detection function
- Wide voltage range: 9 ... 48 V
- SNMP management (HP Open View and IBM/Tivoli NetView capable)
- Http/Web browser user interface, CLI and Menu driven user interfaces via both console and telnet
- Xpress Ring (redundant ring) with less than 50 ms recovery time
- Auto negotiation NWay on RJ-45 port
- Remote & local management
- Extends fiber distance to 2 km (6600 feet) for multi-mode and up to 30 km (99000 feet) for long-haul single-mode fiber
- Status LEDs for quick and easy network activity monitoring
- Firmware upgradeable
- Console Port (RJ-45) - Use this port for local device management. Configure the device through a Terminal Emulator/TELNET Program
- RJ-45 Ethernet port supports auto MDI/MDI-X. Fiber Port- Connect various fiber optic cables (multi mode, single mode, long haul single mode, WDM) to the fiber port.

3 Hardware Description

The Industrial Managed Switch was developed with both “Xpress Ring” and “Jet Ring” features. The Jet ring offers recovery time of less than 300 ms in case of any network-link failure – and the Xpress Ring can recover from such a failure within 50 ms. This makes the Industrial Managed Switch particularly suited for industrial applications that demand the utmost reliability. The device comes with 7 copper and 2 fiber ports that provide 10/100 Base fiber-to-copper conversion. With its industrial design, the Industrial Managed Switch ensures "always-on" connectivity, eliminating costly network downtime.

Being SNMP-ready, the Industrial Managed Switch enables network managers to remotely monitor the entire network's status quickly and easily via an RJ-45 or a console port connection. This Industrial Managed Switch can extend an enterprise's industrial Ethernet configuration range up to 30 km, while simultaneously minimizing troubleshooting time. The Industrial Managed Switch is designed with 'plug-n-play' features for hassle-free integration into today's managed mixed-cabling network configurations.

Featuring Auto MDI/MDI-X detection for direct connection to a workstation, switch or hub, network managers no longer need to worry about the cable configuration (cross-over or straight through) when establishing connections between RJ-45 ports.

The Industrial Managed Switch has auto-negotiation capabilities that allow it to support connection with leading NWay switches. In full-duplex mode, this unit can sustain distances of up to 2 km (for multi-mode fiber) and 30 km (for long-haul single-mode fiber) between it and a LAN switch or another switch or data/file server.

The Industrial Managed Switch features both RJ-45 jacks and slots for LC (SFP-type) fiber-optic connectors that allow it to connect a 10/100Base-TX network to a 100Base-FX (fiber-based) network.

3.1 Connectors

This Industrial Managed Switch utilizes ports with fiber or copper port connectors functioning under Ethernet and/or Fast Ethernet protocols.

3.1.1 10/100BASE-TX Ports

The 10/100BASE-TX ports support network speeds of either 10 Mbps or 100 Mbps, and can operate in half- and full-duplex transfer modes. The ports also offer automatic MDI/MDI-X crossover detection that gives true “plug and play” capability – just plug the network cables into the ports and the ports will adjust according to the end-node devices. The following are the recommended cables for the RJ-45 connectors:

- 10M – Cat 3 or better / 100M – Cat 5 or better

3.1.2 100BASE-FX Ports

The 100BASE-FX ports add fiber-based Fast Ethernet links to your network device. Complying with IEEE 802.3u, these ports can transmit data at 100 Mbps in full-duplex mode across distances of up to 2 km over multi-mode and up to 30 km over single-mode fiber-optic cable. The fiber ports have LC-type connectors.

3.1.3 RS-232 (RJ-45)

When connecting your Switch's console port to your COM port, use the provided console cable. For further information see in chapter “RJ-45 Cables “.

3.2 Views

3.2.1 Front View of Industrial Managed Switch

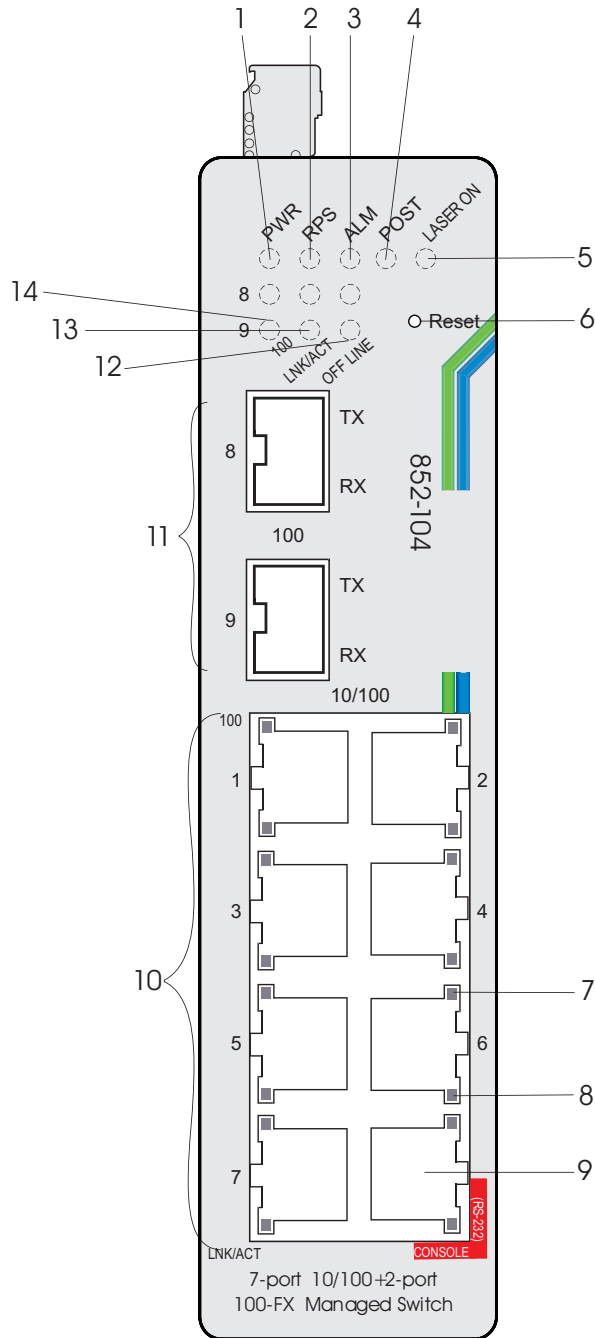


Figure 1: Front view of switch

Pos.	Description	Pos.	Description
1	Primary Power LED	2	Redundant Power LED
3	Alarm LED	4	POST LED
5	LASER ON LED for fiber optic modules	6	Reset button
7	TX port 100Mbps LED	8	TX port LNK/ACT LED
9	RS-232 Console port (RJ-45)	10	TX port 10/100 Mbps (7)
11	100 Base-FX LC Fiberslots (SFP-type) (2)	12	Fiber 100 Mbps LED (2)
13	Fiber port LNK/ACT LED (2)	14	Fiber port Offline LED (2)

3.2.2 TOP View of Industrial Managed Switch

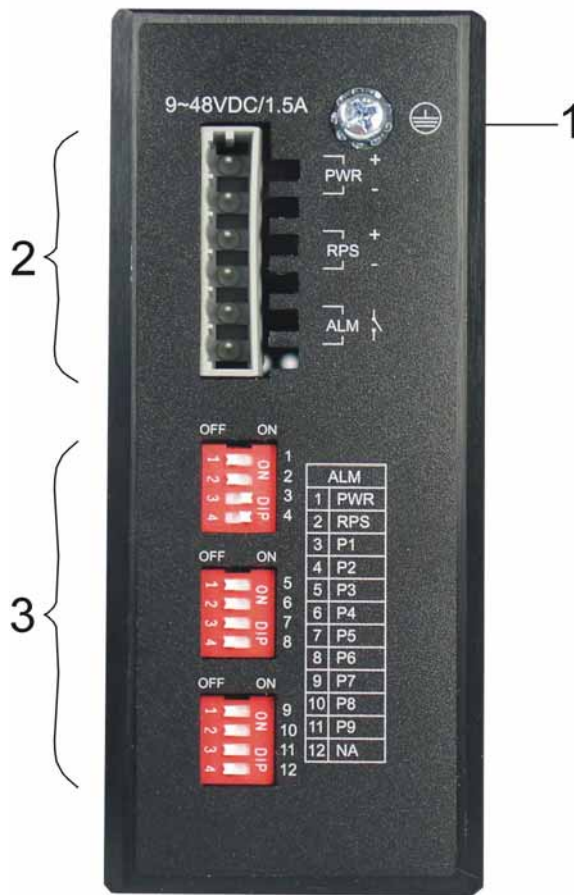


Figure 2: Top view of switch

Position	Description
1	Grounding Screw
2	Terminal block (male connector) for power input (PWR/RPS) and alarm dry contact
3	DIP Switches

3.2.3 Back View of Industrial Managed Switch



Figure 3: Back view of switch

Position	Description
1	DIN Rail Bracket
2	Screw

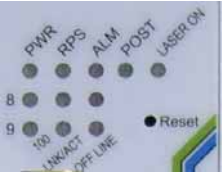
3.3 Display elements

This Industrial Managed Switch is equipped with Unit LEDs to enable you to quickly determine the status of the Switch, as well as Port LEDs to see what is happening across your connection.

They are as follows:

3.3.1 Unit LED's

Table 3: Unit LED's



LED		Designation	Status	Description
	PWR	Primary Power LED	Green	Switch uses primary power
			Off	Primary power off or failure
	RPS	Redundant Power LED	Green	Switch uses redundant power
			Off	Redundant power off failure
	ALM	Alarm LED	Red	Illuminated when power fails or link fails or ring fails (for Arbiter node)
			Off	No alarm to report
	POST	POST LED	Green	POST function successfully performed
			Flashing	Indicating POST function upon start-up
	LASER ON	LASER ON LED for fiber-optic modules	Yellow	Illuminated when fiber port is in use
			Off	No fiber port is in use
8	100	Fiber 100 Mbps LED	Green	Port operating at 100 Mps
			Off	Port operating at 10 Mps
9	LINK/ACT	Fiber port LNK/ACT LED	Green	Illuminated when connectors are attached
			Flashing	Data traffic passing through fiber port
			Off	No valid link established on fiber port
	OFF LINE	Fiber port Offline LED	Red	Illuminated Red when SFP device does not exist
			Off	Both SFP devices are properly plug in

3.3.2 Port LED'S

Table 4: Port LED's

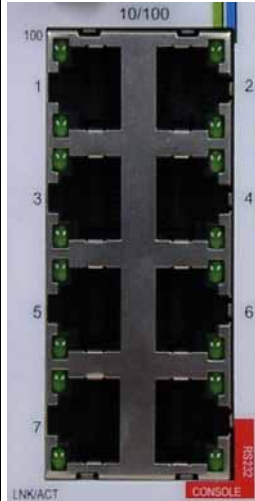
	LED	Designation	Status	Description
	100	TX-port 100 Mbps LED	Green	Port operating at 100 Mps (1 LED for each port)
			Off	Port operating at 10 Mps
	LNK/ACT	TX port LNK/ ACT LED	Green	Illuminated when connectors are attached (1 LED for each port)
			Flash- ing	Data traffic passing through port
			Off	No valid link established on port

Figure 5: Port LED's

3.3.3 Reset Button

Table 5: Reset Button


	Designation	Status	Description
	Reset	Press the button for 2 seconds and release	Restart the system

Figure 6: Reset Button

Note



Please note

The fiber module does not support “half-duplex” mode.

Note



Please note

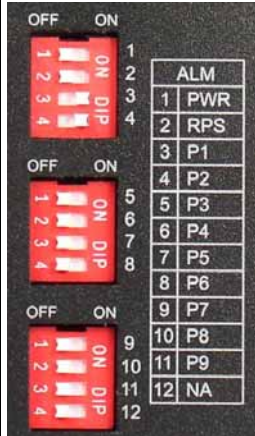
Use a pointed object like straightened paper clip or toothpick to press the Reset button.

3.4 Operating elements

On the top side of the Industrial Managed Switch there are DIP switches to configure the alarm and arbiter configurations.

The meaning of the DIP switch settings are described below:

Table 6: Operating elements



No.	Designation	State	Function
1	PWR	ON	Master power alarm reporting is enabled
		OFF	Master power alarm reporting is disabled
2	RPS	ON	Redundant power alarm reporting is enabled
		OFF	Redundant power alarm reporting is disabled
3	P1	ON	Port 1 link alarm reporting is enabled
		OFF	Port 1 link alarm reporting is disabled
4	P2	ON	Port 2 link alarm reporting is enabled
		OFF	Port 2 link alarm reporting is disabled
5	P3	ON	Port 3 link alarm reporting is enabled
		OFF	Port 3 link alarm reporting is disabled
6	P4	ON	Port 4 link alarm reporting is enabled
		OFF	Port 4 link alarm reporting is disabled
7	P5	ON	Port 5 link alarm reporting is enabled
		OFF	Port 5 link alarm reporting is disabled
8	P6	ON	Port 6 link alarm reporting is enabled
		OFF	Port 6 link alarm reporting is disabled
9	P7	ON	Port 7 link alarm reporting is enabled
		OFF	Port 7 link alarm reporting is disabled
10	P8	ON	Port 8 (SFP) link alarm reporting is enabled
		OFF	Port 8 (SFP) link alarm reporting is disabled
11	P9	ON	Port 9 (SFP) link alarm reporting is enabled
		OFF	Port 9 (SFP) link alarm reporting is disabled
12	NA		Not assigned

Figure 7: Operating elements

DIP-switches let the user manually turn “ON/OFF” any port, the external Alarm, or the redundant power supply.

DIP-switch to the “ON” position to manually enable the alarm function for the port. Default is “OFF”.

The following is the Recommended Procedure for configuring and setting DIP-switches during initial installation:

- 1 Turn all DIP-switches “OFF”.
- 2 Install the Industrial Switch into your network.
- 3 Decide which port(s) need to be monitored or should trigger the alarm.
- 4 Turn the corresponding port DIP-switch “ON”.
- 5 Activate the Industrial Switch.

3.5 Connection elements

3.5.1 Power Input (PWR/RPS)

The female connector can easily be connected to the 6-pole male connector located on the top of the switch.

The male connector shows the following pin assignment:

Table 7: Power Input (PWR/RPS)

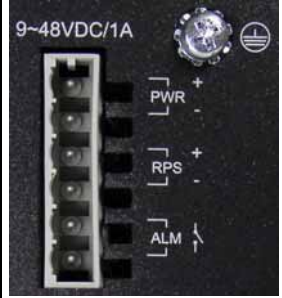
		Name	Designation
	+	PWR	Primary DC input
-	PWR	Primary DC input	
+	RPS	Redundant DC input	
-	RPS	Redundant DC input	
	ALM	Contact for external alarm	
	ALM	Contact for external alarm	

Figure 8: Power Input

NOTICE



Warning of damage to equipment by electrostatic discharge

DC Powered Switch: Power is supplied through an external DC power source. Check the technical specification section for information about the DC power input voltage. Since the switch does not include a power switch, plugging its power adapter into a power outlet will immediately power it on.

4 Assembly

5 Installation

The location selected to install the Industrial Switch may greatly affect its performance. When selecting a site, we recommend considering the following rules:

- Install the Industrial Switch at an appropriate place. See in chapter “Technical Data” for the acceptable temperature and humidity operating ranges.
- Fix the provided brackets at the back of the Industrial Switch to a DIN rail to protect the switch from falling.



DANGER

Warning of physical injury due to electric current

Because invisible laser radiation may be emitted from the aperture of the port when no cable is connected, avoid exposure to laser radiation and do not stare into open apertures.



Note

Please note

Default Communication Parameter:

IP Address: Default: 192.168.0.254

Subnet Mask: Default: 255.255.255.0

RS-232 Parameter:

- Bits per seconds: 38400

- Data Bits: 8

- Parity: None

- Stop Bits: 1

- Flow control: None

5.1 DIN Rail Mounting

The aluminum DIN Rail attachment plate should already be affixed to the back panel of the Industrial Switch. If you need to attach the DIN Rail plate, assure that the stiff metal spring is situated towards the top. Attaching the Industrial Switch to the DIN rail is easy, just align, and attach the top rail, then press down and snap forward the Industrial Switch to snap in the bottom rail, as shown in the figures below.

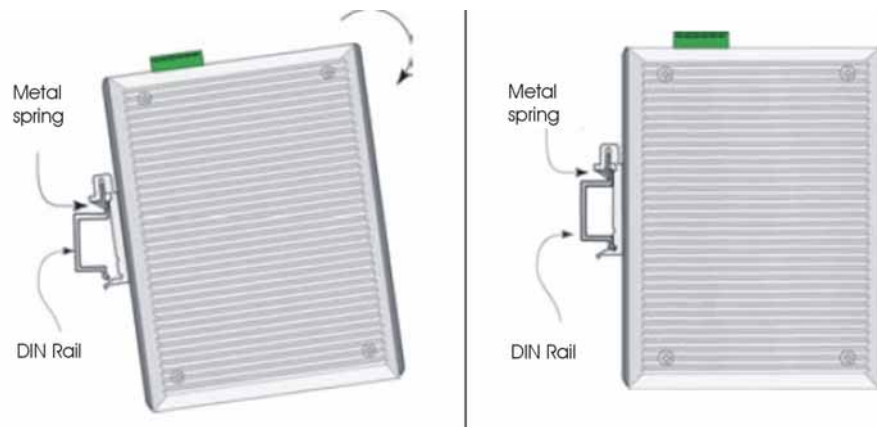


Figure 9: DIN Rail Mounting

The setup of the Industrial Switch can be performed using the following steps:

- The surface must support at least 1.5 kg for the Industrial Switch.
- Visually inspect the DC power jack and make sure that it is fully secured to the power adapter.
- Make sure that there is proper heat dissipation from and adequate ventilation around the Industrial Switch. Do not place heavy objects on the Industrial Switch.
- The carrier rail must optimally support the EMC measures integrated into the system and the shielding of the internal data bus connections.

Note



Important note

Grounding Industrial Switch will help eliminate the effects of noise due to electromagnetic interference (EMI). Always run the ground connection from the ground screw to the grounding surface prior to connecting DC power.

6 Connect Devices

6.1 DC Power Connection

The Industrial Switch uses a DC power supply of 9 ... 48 V DC.

The primary and redundant power connection is provided via a terminal block located at the top of the Industrial Switch.

The terminal block is composed of six contact pins and can be inserted and removed easily by hand to connect to the six pin terminal block receptor (male contacts located on the body of the Switch).

The Switch's power supply automatically self adjusts to the local power source and may be powered on without having any or all LAN segment cables connected.

- 1 Check the front panel LEDs as the device is powered on to verify that the Power LED is lit. If not, check that the power cable is correctly and securely plugged in.
- 2 If a redundant power supply is connected, an RPS LED will be illuminated.
- 3 „PWR +/-„ conductors:
To connect or disconnect the conductors, actuate the spring directly in the female connector using a screwdriver or an operating tool and insert or remove the conductor.
- 4 For the back up DC connection, follow the same procedure as above. Attach power wires to the terminal block (in the position marked RPS +/-).
- 5 If the terminal block is not already inserted into the block receptor of the Switch, do so now.

6.2 External Alarm Contact Connection

The Industrial Switch has one alarm contact connection point located on the grey terminal block on the top panel. For detailed instructions on how to connect the alarm contact power wires to the two ALM contacts of the 6 contact terminal block connector, see the procedure for connecting DC Power in the section above (it is the same procedure).

You can connect the alarm circuit to any warning device which the user's factory or industry already has installed in the control room or factory floor. When a fault occurs, the Industrial Switch will send a signal through the alarm contact, to activate this external alarm. The alarm contact has two terminals that form a fault circuit for connecting to alarm system.

An alarm will be signaled in the following situations:

- 1 Port link failure (e.g.: cable disconnected, device breakdown, etc.)

- 2 PWR/RPS:
 - a Power failure a Power cord is disconnected, power supply malfunction, etc.
 - b Input power is out of the range listed in the specifications (9 ...48 V)

6.3 Fiber Cable Connection

When connecting fiber cable to a 100BASE-FX port on the Industrial Managed Switch, be sure the correct type (LC) of connector and SFP module is used. Various types of multi mode, single mode, or WDM SFP modules are sold separately. Follow the steps below to properly connect the fiber cabling:

Note



Please note

Remove and keep the fiber port's (LC) rubber covers. When not connected to a fiber cable, the rubber cover should be in place to protect the fiber optics.

- 1 Plug in the appropriate SFP modules.
- 2 Check that the fiber terminators are clean. You can clean the cable plugs by wiping gently with a clean tissue or cotton ball moistened with a little ethanol. Dirty fiber terminators on fiber cables will impair the quality of the light transmitted through the cable and lead to degraded performance on the port.
- 3 Connect one end of the cable to the LC port on the Industrial Managed Switch and the other end to the fiber port of the other device.

Note



Please note

When inserting the cable, be sure the tab on the plug clicks into position to ensure that it is properly connected.

- 4 Check the corresponding port LED on the Industrial Managed Switch to be sure that the connection is valid. (Refer to the LED chart)

6.4 Copper Cable Connection

The Industrial Managed Switch's 10/100BASE-TX RJ-45 Ethernet ports fully support auto sensing and auto negotiation.

- 1 Insert one end of a Category 3/4/5/5e type twisted pair cable into an available RJ-45 port on the Industrial Managed Switch and the other end into the port of the selected network node.
- 2 Check the corresponding port LED on the Industrial Managed Switch to be sure that the connection is valid. (Refer to LED chart)

6.5 Console Port Cable Connection

The console port (RJ-45) provides the local management facility.

- 1 Insert the RJ-45 side of the (8 pin RJ-45 to DB9) cable into the RJ-45 console port on the Industrial Managed Switch and the other end into the COM port of the computer.
- 2 Configure the Hyper Terminal settings as mentioned in chapter "Connecting a HyperTerminal".

For console port (8 pin RJ-45) pin assignment, please see in the chapter "Console Cable (RJ-45 to DB9)".

7 Enhanced Features

7.1 Jet Ring – for Communication Reliability

Setting up Jet Ring (redundant linking) on your network helps to protect critical links against failure and network loops; and it reduces network downtime to less than 300 ms.

The Jet Ring function allows users to set up a redundant path in the network to provide a backup data-transmission route in the event that a connection is abruptly disconnected or damaged. This is an extremely important feature in industrial applications because a link failure in a link with no backup can cause several minutes of network downtime and thus cause heavy losses.

7.2 How Jet Ring Recovers in less than 300 ms

The Jet Ring protocol is designed to optimize redundant communication linking and deliver a very fast link-recovery period. The Jet Ring automatically identifies one switch as the “master” of the network, and then automatically blocks ports to prevent packets from traveling through any of the network’s redundant loop segments. If one segment of this ring becomes disconnected from the rest of the network because of a link failure, the Jet Ring protocol automatically re-adjusts the ring so that the part of the network that was disconnected, re-establishes contact with the rest of the network.

The user does not need to designate the master switch to use Jet Ring, this is done automatically.

The Jet Ring ensures smooth operation of industrial automation devices in many critical applications. It will put your automation system back to full operability in less than 300 ms if any node of your network goes down.

Step 1

You can apply the ring in the diagram below by connecting 4 units of Industrial Managed Switches.

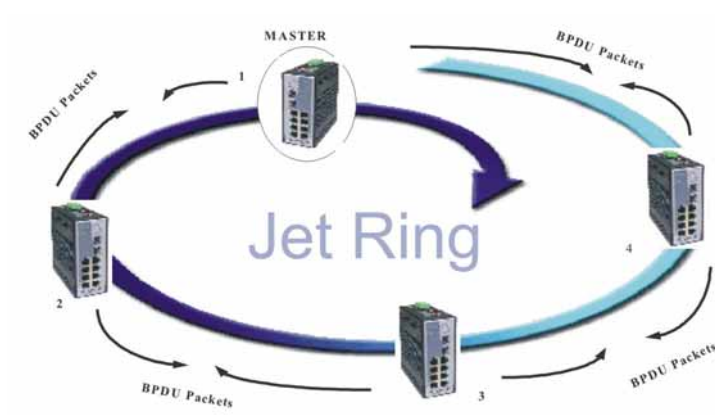


Figure 10: JetRing

Step 2

Jet Ring then automatically selects the Arbiter switch and the network is ready.

7.3 Xpress Ring

Xpress Ring is a ring protocol that enables networks to recover from link failure within 50 ms. Unlike Jet Ring, it needs some network configuration efforts: The user must assign two ring ports for each Switch in the ring. The user must also assign the Arbiter Switch, which will decide if it is necessary to activate the backup path. For Xpress Ring, any switch can be the arbiter – just remember that the arbiter switch must be part of the ring.

Apart from rerouting the transmission within 50 ms, the Arbiter Switch will also issue an alarm when a link failure occurs. The user will then be informed of the failure and will be able to fix the problem and reconfigure if required.

Xpress Ring is the faster ring recovery technology and is ideal for networks where the ring topology is not changed very often.

Please refer to the following chapter for the configuration of the Xpress Ring.

7.4 Coupling Ring

The Coupling Ring function connects two Xpress Rings via redundant links (Primary Link & Secondary Link). Please refer to the following illustration. When the primary link (port 2 at the Master Switch of coupling role) fails, the secondary link (port 2 at the Arbiter Switch of coupling role) will automatically kick in within milliseconds. The Secondary Link is blocked during normal operations, and it is enabled automatically when the Primary Link is disconnected. The Secondary Link is blocked again automatically when the Primary Link recovers.

Control Line of Coupling Ring (port 1 at the Master Switch of coupling role/port 1 at the Arbiter Switch of coupling role) is used for negotiation between Master and Arbiter Switches of coupling role and to decide when the secondary link should be enabled or blocked. It is needed to set coupling roles as “Master”, “Arbiter”, or “Normal” (all other Switches not Master neither Arbiter) to Switches in the Xpress Ring, and assign coupling’s ring and control ports to the Master and Arbiter Switches, to one side only of two interconnected rings.

Coupling Ring is designed based on Xpress Ring. For configuring the Coupling Ring feature, please consult the appropriate chapter in this manual.

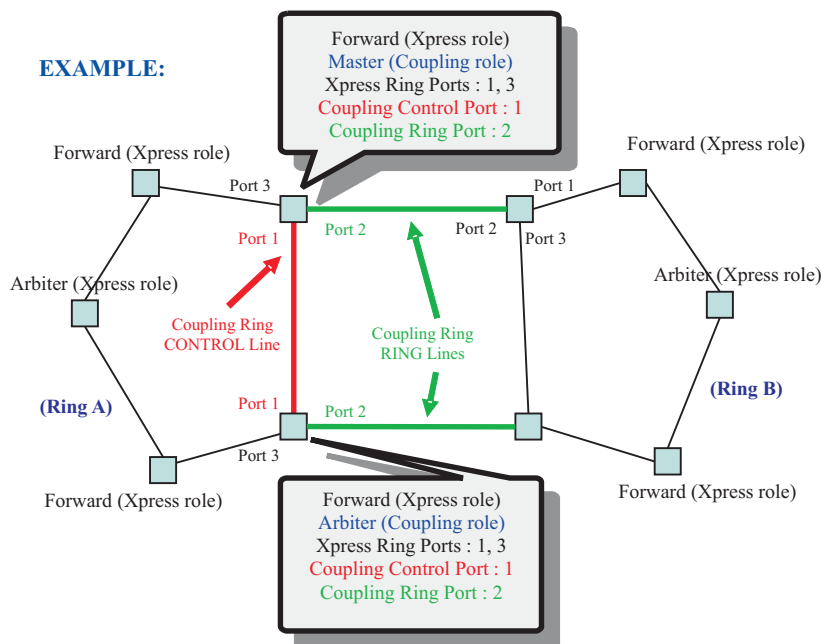


Figure 11: Coupling Ring

8 Configuration

8.1 Overview of Configuration Options

For advanced management capabilities, the onboard management agent provides CLI and menu driven interface configuration programs. These programs can be accessed by a direct or modem connection to the console port on the front panel (local), or by a Telnet connection over the network.

The management agent is based on SNMP (Simple Network Management Protocol). This SNMP agent permits the switch to be managed from any PC in the network by using management software.

The management agent also includes an embedded HTTP Web agent. This Web agent can be accessed using a standard Web browser from any computer attached to the network.

The Industrial Managed Switch gives you the flexibility to access and manage it by using any or all of the methods described. The administration console and web browser interfaces are embedded in the switch software and can be used immediately after setup.

External SNMP-based network management application

Advantages:

- Communicates with switch functions at the MIB level
- Based on open standards

The three methods for configuring the Industrial Managed Switch management agent are explained in this chapter.

The first method – Command Line Interface (CLI) via the Console Port to initially set IP parameters – is explained in part A.

The second is Menu Driven configurations via Telnet – explained in part B.

Part C explains the use of an Internet Browser Interface to configure the Industrial Managed Switch.

Part D provides some basic operational examples for using CLI via Telnet.

Complete part A and then proceed to either part B, C or D.

8.2 A - Console Port

Local Connection

Prior to accessing the Industrial Managed Switch's onboard agent via a network connection, you must first configure it with a valid IP address, subnet mask, and default gateway using a local connection or the BOOTP protocol.

After configuring the Industrial Managed Switch's IP parameters, you can access the onboard configuration program from anywhere within the attached network or via Internet. The onboard configuration program can be accessed using Telnet from any computer attached to the network. It can also be managed from any computer using a Web browser (Internet Explorer 4.0 or above, or Netscape Navigator 4.0 or above).

Access the Industrial Managed Switch via a terminal emulator (such as Hyper Terminal) attached to the console port. The console port is set at the factory with the following default COM port properties. Configure your own terminal to match the following:

Table 8: Console Port Terminal

Console Port Terminal	
Baud rate	38,400
Data size	8 bits
Parity	None
Stop bits	1
Flow Control	None



Note

Please note

Ensure that the terminal or PC you are using to make this connection is configured to match the above settings. Otherwise the connection will not work.

A console port cable is provided with the Industrial Managed Switch to connect the PC's COM port with the Industrial Managed Switch's serial console (RJ-45) port. Please see in chapter "RJ-45 Cables" in assignment details.

8.2.1 Connecting a HyperTerminal

Prior to following the instructions listed below for HyperTerminal, verify that a console cable (RJ-45 to DB9) connection between the Industrial Managed Switch and workstation exists. Then follow the steps below:

- 1 Launch the terminal emulation program on the remote workstation and power on the Industrial Managed Switch. Be sure to select the correct COM port.



Figure 12: Connect to switch

- 2 Enter the correct parameters according to the defaults given above.

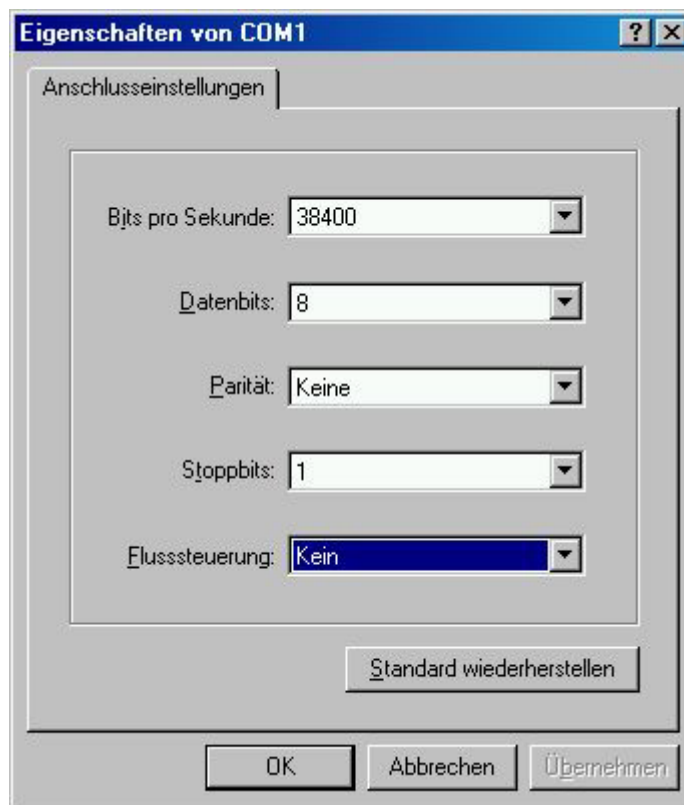


Figure 13: COM1 properties

- The following screen will appear after selecting [OK]. Press [ENTER] to start and move to the **Log in** screen.

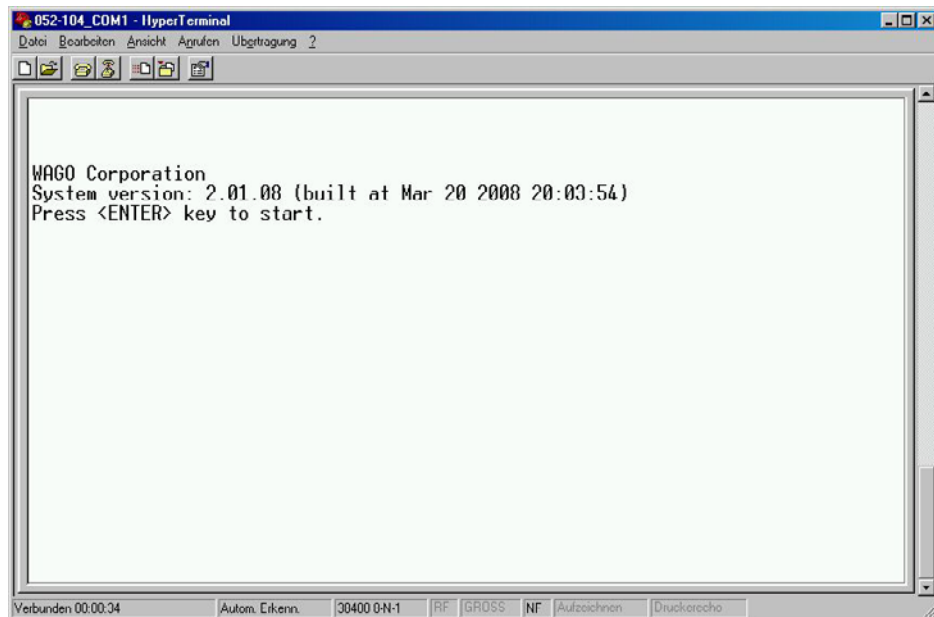


Figure 14: Systemversion

- The default log in name is **admin** with no preset password. The system provides both CLI and menu-driven user interfaces via console or telnet. After you log into the system, you will see a welcome message as below:

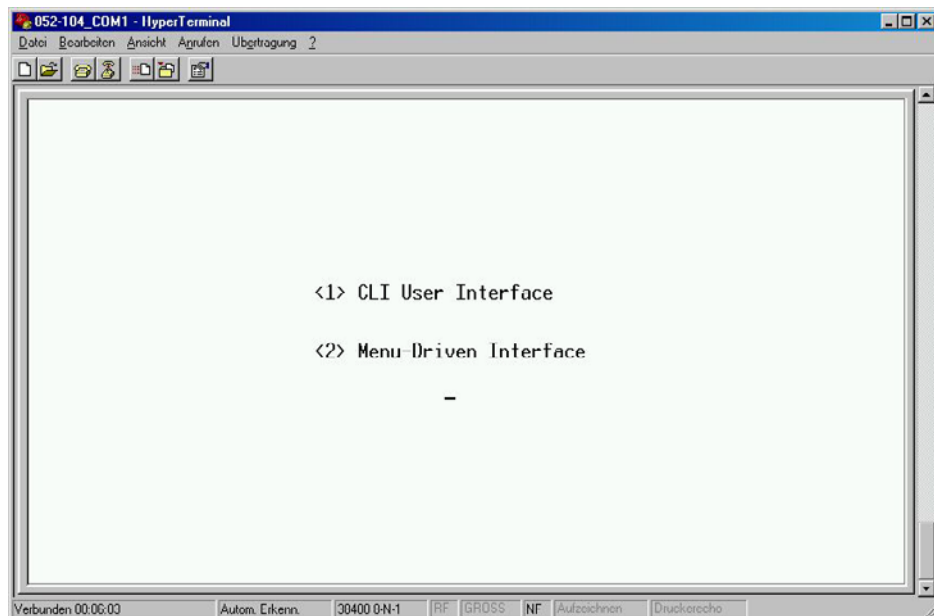


Figure 15: Interface

5 Type 1 to select CLI operations

After log-in, type the following command to change the device's IP address, Network Mask and Gateway Address:

```
set eth0 ip xxx.xxx.xxx.xxx  
set eth0 netmask xxx.xxx.xxx.xxx  
set eth0 gateway xxx.xxx.xxx.xxx
```

The **xxx**'s represent values between 0 and 255 and the user should enter their own IP address in this form. The configuration program will not accept anything outside this format. Remember to separate each part of the address with a period (dot). For example:

- 852-104>set eth0 ip 192.168.0.200

After entering the new IP address, the system will confirm whether the operation was successful.

6 The system will restart automatically

When the address has been changed, please make a note of the new address, and keep it in a safe place. With HyperTerminal, the command lines are the same as that for telnet. Users can continue to use Hyper Terminal along with the instructions given in part D. Otherwise, log out by typing exit and pressing the [ENTER] key. Then, the user can choose to configure the Industrial Managed Switch via HTTP web browser or telnet with Menu Driven or Command Line interfaces.



Note

Please note

IP addresses are unique. If an address isn't available, please contact the system administrator to apply for one.

8.3 B – Menu driven User Interface via Telnet

This section gives a step by step guide to configuring the Industrial Managed Switch management functions. A series of screen shots (SS#) and instructions illustrates the main menu structure, and how it works.

- 1 Open a Command Prompt window and type

telnet xxx.xxx.xxx.xxx where the xxx's represent the IP address.

As an example, we'll continue to use the IP address configured in part A of this manual: 192.168.0.200

- 2 Then press [ENTER] key to start.

SS1 – Log in

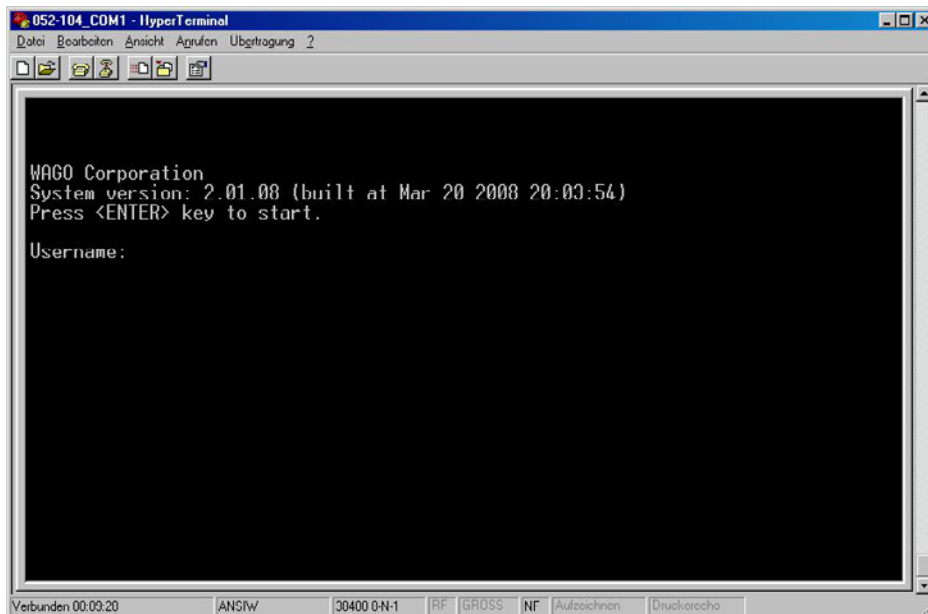


Figure 16: Log in

- 3 The default log in name is **admin** with no preset password.
The system provides both CLI and menu driven user interfaces via console or telnet. After you log into the system, you will see a welcome message as below:

SS2 – Welcome

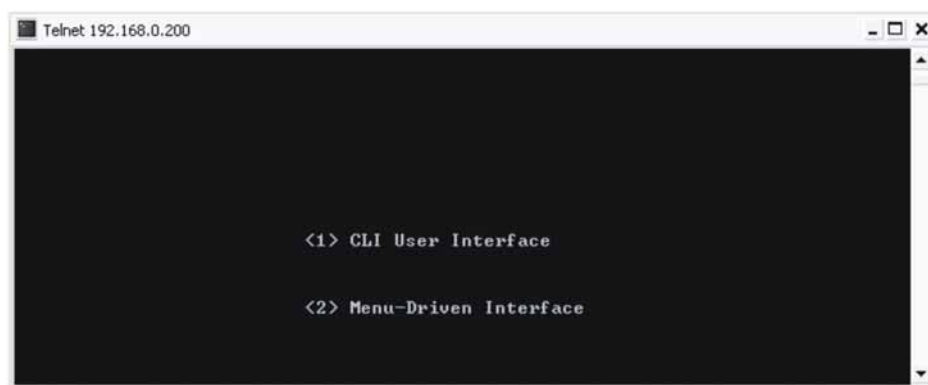


Figure 17: Welcome screen

4 Select **Menu Driven**, the system will launch the following:

SS3 - Main Menu



Figure 18: Main menu

Use the **[Tab]** to move up and down the menu, and the **[ENTER]** key to select. Choose the following operations from the main menu system. See description below:

Table 9: Main menu

Parameter	Description
Systems Information Menu	Provides default system information. i.e. IP Address, Network Mask, Gateway, etc.
DHCP Configuration Menu	Disabled – or Enabled with DHCP Client State, DHCP Leased Time in seconds, DHCP Expiry Time in seconds
Device Control menu	Provides configuration options for ports, Bridge menu, VLAN menu, and Jumbo Packet / Multicast Rate limit menu
Management Setup Menu	Provides SNMP, E-mail alarm Configurations menu and firmware upload menu
Port Counter Menu	Provides the ports status view at a glance
System Restart Menu	This menu provides options to the user for restarting the switch through software and/or restore the factory default settings
Exit	Return to Main Menu

SS4 - System Information

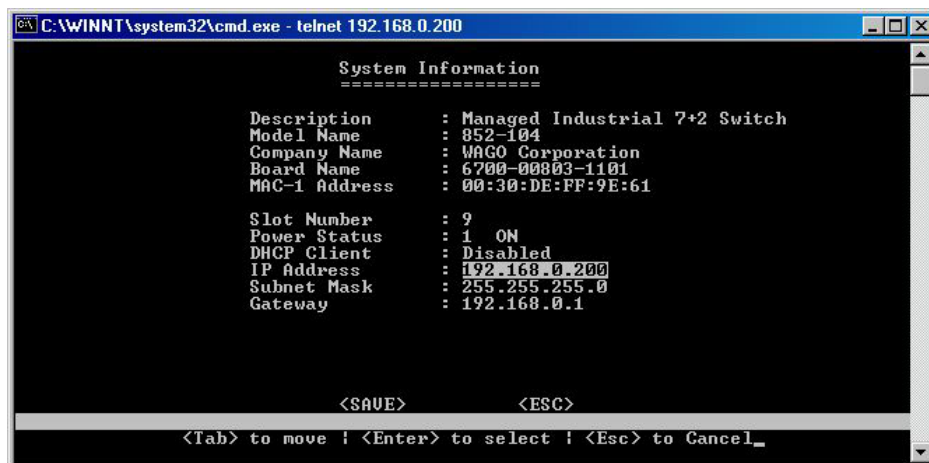


Figure 19: System information

Use the **[Tab]** key to move from one field to the next and the **[ENTER]** key to get a text prompt. Press **[ENTER]** to exit the field. Select **[SAVE]** after editing, or **[ESC]** to return to the Main Menu system (all unsaved work will return to default or the last saved values). Set IP Address, Subnet Mask, and Gateway on this page. See descriptions below:

Table 10: System information

Parameter	Description
Description	Provides description of the Switch
Model No	Shows Model No
Company Name	Manufacturer's Company Name
Board Name	Information about the Board used in the Switch
MAC Address	Display MAC Address of the Switch
Slot number	Total number of Switch's fast Ethernet slots/ports
Power status	Display the primary and redundant power status
IP Address	Display IP address of the switch. The user can change the IP address as per requirement (Default: 192.168.0.254)
Subnet Mask	Show the subnet mask of the switch, which identifies the host address bits used for routing to specific subnets. User must use the appropriate subnet mask with the assigned IP address (Default: 255.255.255.0)
Gateway	Gateway used to pass trap messages from the system's agent to the management station. User must assign the gateway as per their network configurations (Default: 192.168.0.1)

8.3.1 DHCP Configuration Menu

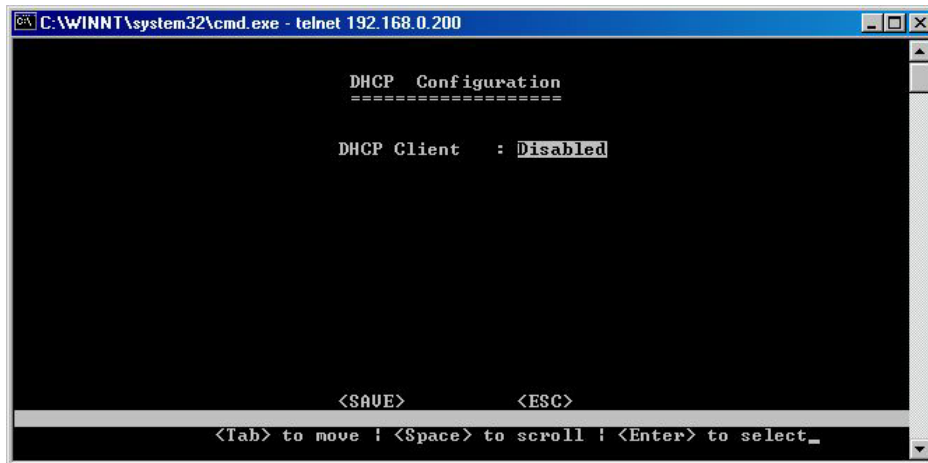


Figure 20: DHCP Configuration Menu

A choice of either **“Disabled”** or **“Enabled”** with DHCP Client State, DHCP Leased Time in seconds and DHCP Expiry Time in seconds.

8.3.2 Device Control Menu (DCM)

SS5 – Device Control Menu

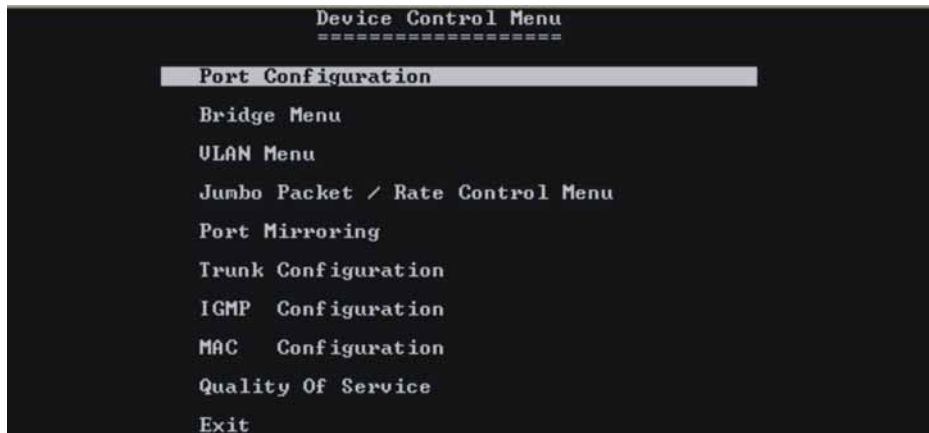


Figure 21: Device Control Menu

Use the **[Tab]** to move up and down the menu, and the **[ENTER]** key to select and unselect. Choose the following operations from the menu system.

Table 11: Device Control Menu

Parameter	Description
Port Configurations Menu	Use this menu to configure various parameters for each port of the Switch.
Bridge Menu	Use this menu for Bridge configurations.
VLAN Menu	Use this menu to configure port based or tag based VLANs.
Jumbo Packet / Rate Control Menu	Users can define Jumbo Packet limit and bandwidth/data rate control for each port.
Port Mirror	Options to select a port for mirroring to monitor the traffic.
Trunk Configuration	Configure up to 4 trunk groups.
IGMP Configuration	Configure IGMP snooping, query and check group status.
MAC Configuration	Here you can check the MAC Table Status, lock the MAC Address Learning and do Static Unicast MAC Configuration and Mac Limit Configuration
Quality Of Service	Set the QoS Base Configuration, Tag Priority Table and IP ToS Priority Table
Exit	Return to Main Menu

SS6 – (DCM)/Port Configuration Menu

No.	Name	Type	Admin	Speed	Duplex	Link	Auto	Flow Control
1		RJ45	Enabled	10M	HALF	DOWN	ON	Enabled
2		RJ45	Enabled	10M	HALF	DOWN	ON	Enabled
3		RJ45	Enabled	10M	HALF	UP	ON	Enabled
4		RJ45	Enabled	10M	HALF	DOWN	ON	Enabled
5		RJ45	Enabled	10M	HALF	DOWN	ON	Enabled
6		RJ45	Enabled	10M	HALF	DOWN	ON	Enabled
7		RJ45	Enabled	10M	HALF	DOWN	ON	Enabled
8		RJ45	Disabled	10M	HALF	DOWN	ON	Enabled
9		Fiber	Enabled	100M	FULL	DOWN	N/A	N/A

No.	Type	Name	Admin	Auto	Speed	Duplex	Flow-Control	Cfg.Line
0								

<Tab> to move | <Enter> to select | <Esc> to Cancel

Figure 22: Port Configuration Menu

Use the [Tab] key to move from one field to next and the [ENTER] key to select and unselect. Press [ENTER] to exit the field. Select [SAVE] after editing, or [ESC] to return to the Main Menu system (all unsaved work will return to default or last saved values).

Table 12: Port Configuration Menu

Parameter	Description
Port No.	Press [Enter] and [Port No.] and [ENTER] and [Tab] in settings panel.
Name	Assign a name to each port to keep record of your connections.
Type	Type of port connector (A choice of fiber or RJ-45)
Admin	Enable or disable admin configurations.
Speed	Provides information on speed at which ports are operating User can set the speed for RJ-45 ports (10 ... 100 Mbps).
Duplex	Provides information on Duplex Status. User can select half / full duplex modes.
Link (status only)	Provides information on link status.
Auto	Enable / Disable Auto negotiation on copper ports.
Flow Control	Disable or Enable for RJ-45 ports.

8.3.3 (DCM)/Bridge Menu

The Bridge Menu is used to Enable/Disable STP (Spanning Tree Protocol Algorithm), JET Ring or Xpress Ring, as well as to configure the STP settings if STP is enabled.

If Jet Ring is enabled it offers a fast recovery time of less than 300 ms in case a node goes down in the ring. Xpress Ring offers a very fast recovery time of less than 50 ms.

The Spanning Tree Algorithm is used for detecting and disabling network loops, and to provide backup links between switches, bridges and routers. This allows the switch to communicate and interact with other bridging devices (i.e. STP-compliant devices) in a network to ensure that only one route exists between any two stations, and provide redundant or backup links that automatically take over when a primary link fails.

SS7 – (DCM)/Bridge Menu

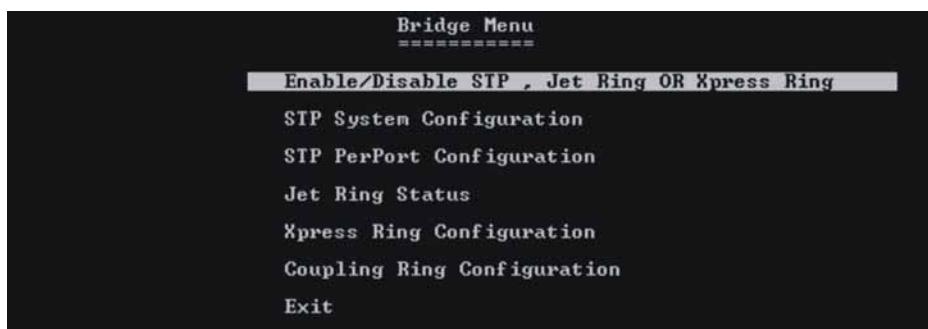


Figure 23: Bridge Menu

SS8 – (DCM)/Bridge/Enable/Disable STP, Jet Ring or Xpress Ring

Users can Enable/Disable Spanning Tree Protocol, Jet Ring or Xpress Ring as per their network needs. Select the option to choose the parameters.

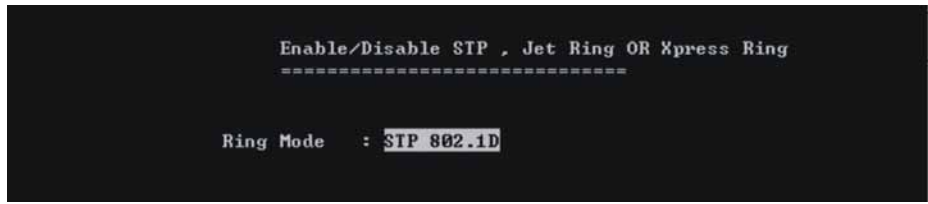


Figure 24: Enable/Disable STP

The default value is **Disabled**. Use the **[Tab]** key to move from one field to next and the **[Enter]** key to select and unselect. Press **[Enter]** to exit the field. Select **[SAVE]** after editing, or **[ESC]** to return to the Main Menu system (all unsaved configurations will return to default or last saved values).

SS9 – (DCM)/Bridge/STP System Configuration:

Use this option to configure the STP parameters. Before moving to this menu, make sure you select **STP 802.1D** mode in previous menu screen (Enable/Disable STP, Jet Ring or Xpress Ring). Otherwise, you wouldn't be able to configure the values.

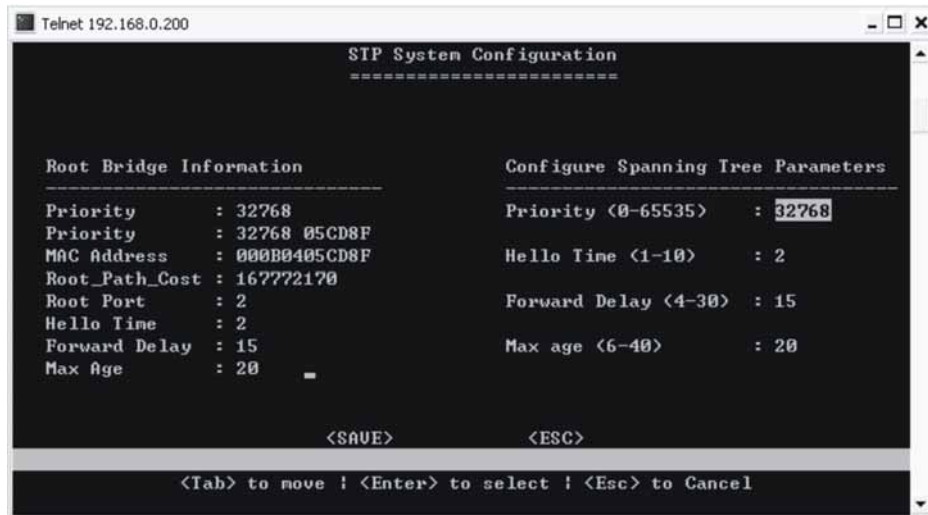


Figure 25: STP System Configuration

On the left side of the window, root bridge information is displayed.

Table 13: STP System Configuration

Parameter	Description
Bridge Priority	Set the bridge priority. The limit is given between 0 (the highest priority) and 65535 (the lowest priority). Bridge priority is used in selecting the root device, root port, and designated port. The device with the highest priority becomes the STP root device. However, if all devices have the same priority, the device with the lowest MAC address will then become the root device.
Hello Time	Time interval (in seconds) at which the root device transmits a configuration message. The limit given is from 1 ... 10 s.
Forward Delay	Set Forward Delay. The limit given is from 4 ... 30 s. This is the maximum time (in seconds) the root device will wait before changing states (i.e., listening to learning to forwarding).
Max. Age	Set the (maximum age) waiting time for receiving packets before attempting to reconfigure the link. The limit given is from 6 ... 40 s.

SS10 – (DCM)/Bridge/STP Per-Port Configurations

STP allows the Switch to assign a priority status to each of its ports, with respect to other networking nodes in the network. In other words, STP determines the best route for data to flow, given the priority level of each node on the network. Ensure that this function is activated to avoid collisions and when setting up backup links.

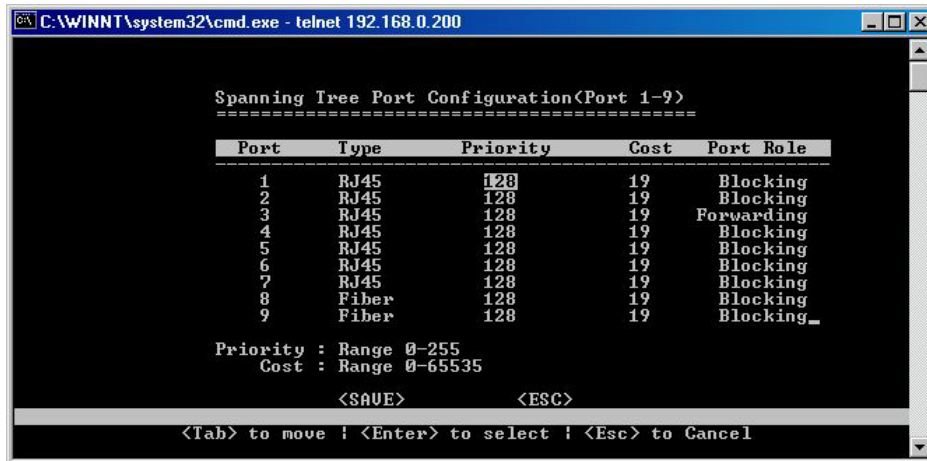


Figure 26: STP per Port Configuration

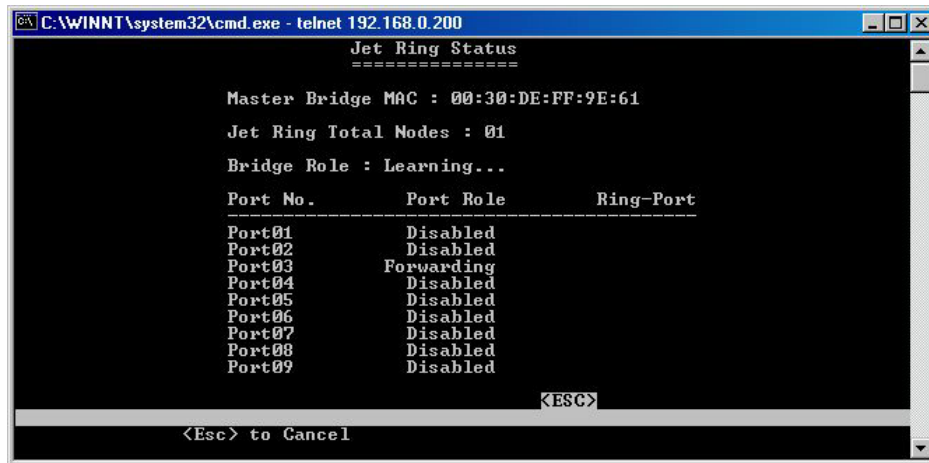
Use the **[Tab]** key to move from one field to the next and the **[Enter]** key to select and unselect. Press **[Enter]** to exit the field. Select **[SAVE]** after editing, or **[ESC]** to return to the Main Menu system (all unsaved work will return to default or last saved values).

Table 14: STP per Port Configuration

Parameter	Description
Port Type Priority	Set the priority of each port. The limit given is from 1 ... 255. The default priority is set to 128 – the midpoint of this limit.
Cost	Set the cost assigned to each port. This will determine the route of information flow.
Port Role	Displays the role of each port (Forwarding or Blocking).

SS11 – (DCM)/Bridge/Jet Ring Status

If Jet Ring is enabled, the user can view the Jet Ring status. The Industrial Managed Switch will automatically detect which port is attached to other Industrial Managed Switches (or other Jet Ring-enabling switches) to establish the Jet Ring. The user can see how many nodes are connected in the ring and which node is working as Master, Arbiter or member. There are also descriptions of the role of each port.



```
C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
Jet Ring Status
=====
Master Bridge MAC : 00:30:DE:FF:9E:61
Jet Ring Total Nodes : 01
Bridge Role : Learning...
Port No.          Port Role      Ring-Port
-----
Port01           Disabled
Port02           Disabled
Port03           Forwarding
Port04           Disabled
Port05           Disabled
Port06           Disabled
Port07           Disabled
Port08           Disabled
Port09           Disabled
<ESC>
<Esc> to Cancel
```

Figure 27: JetRing Status

SS12 – (DCM)/Bridge/Xpress Ring Configuration

Once Xpress Ring (sometimes called Jet Ring Plus) is enabled, the user can configure the Xpress Ring. The user can select the role of the switch in the Xpress Ring (**Arbiter** or **Forward**) and select which ports will be part of the Xpress Ring.



Figure 28: XpressRing Configuration

Table 15: XpressRing Configuration

Port	Configuration	
Xpress Ring Role	Arbiter	The Switch which receives status reports submitted from other Switches of the ring and decides the ring recovery behaviours.
	Forward	The Switch which is not the Arbiter of the ring and will forward the received status reports on the other side of ring ports.
Select Ring Port-1	The first ring port with the link composing part of the Xpress Ring.	
Select Ring Port-2	The second port with the link composing part of the Xpress Ring.	
Port status	Display the ring port statuses as - Forwarding for packet transmitting and receiving status, or - Blocking for port disabled or link down status.	

8.3.4 Coupling Ring

Set Coupling Ring configurations to all Switches of either side of two interconnected Xpress Rings.

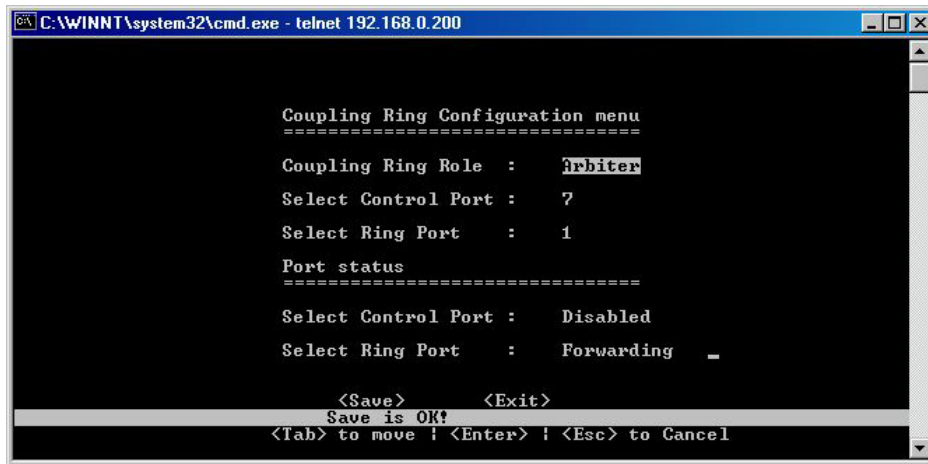


Figure 29: Coupling Ring

Table 16: XpressRing Configuration

Port	Configuration	
Coupling Ring Role	Arbiter	The Switch with the backup secondary link to the other Xpress Ring.
	Master	The Switch with the primary link to the other Xpress Ring.
	Normal	The Switches not with the links connecting to other Xpress Ring.
Select Control Port	The Control Port of Coupling Ring Master Switch or Arbiter Switch for communication with each other.	
Select Ring Port	The Ring Port of Coupling Ring Master Switch or Arbiter Switch for connection to the peer coupled Xpress Ring.	
Port status	Display the port status of Control Port or Ring Port as - Forwarding for packet transmitting and receiving status, or - Blocking for port disabled or link down status.	

8.3.5 (DCM)/VLAN (Virtual Local Area Networks) Menu

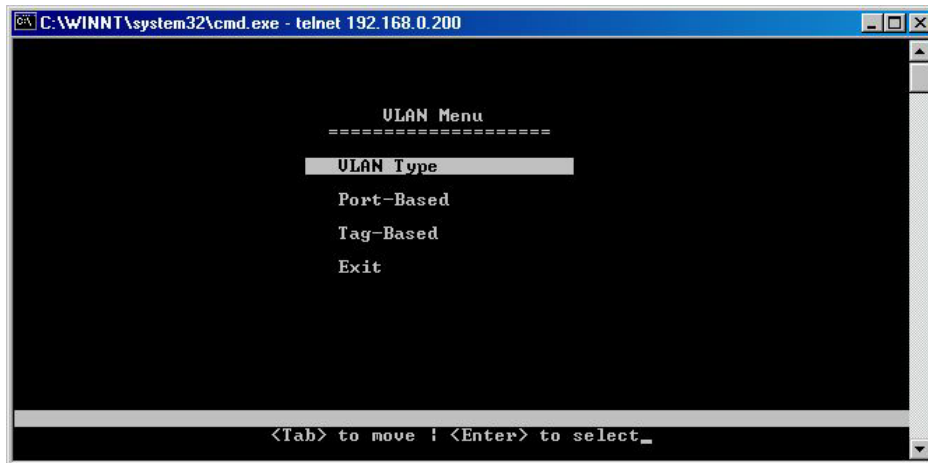


Figure 30: VLAN Menu

A VLAN is a network of computers behaving as though they are connected to the same LAN segment, even though their physical location may be on a different LAN altogether. VLANs are configured through software rather than hardware, which make them extremely flexible.

Some of the advantages of VLANs are:

- When a computer is physically moved to another location, it can stay on the same VLAN without any hardware reconfiguration because VLANs are not limited by hardware constraints.
- VLANs can be configured to define a network into various logical configurations. For example, VLANs can define a network by application. In this scenario, a company might create one VLAN for multimedia users and another for e-mail users.
- VLANs can also define a network by department. For example, a company might have one VLAN for its Engineering Department, another for its Marketing Department, and another for its Sales Dept.
- VLANs can also be set up according to the organization's internal structure. For example, the company president might have his/her own VLAN, the executive staff might have a different VLAN, and the remaining employees might have yet another VLAN.

As these examples show, VLANs offer unparalleled flexibility. The following section describes how VLANs can be deployed using the Switch.

8.3.5.1 VLAN Type Select Menu

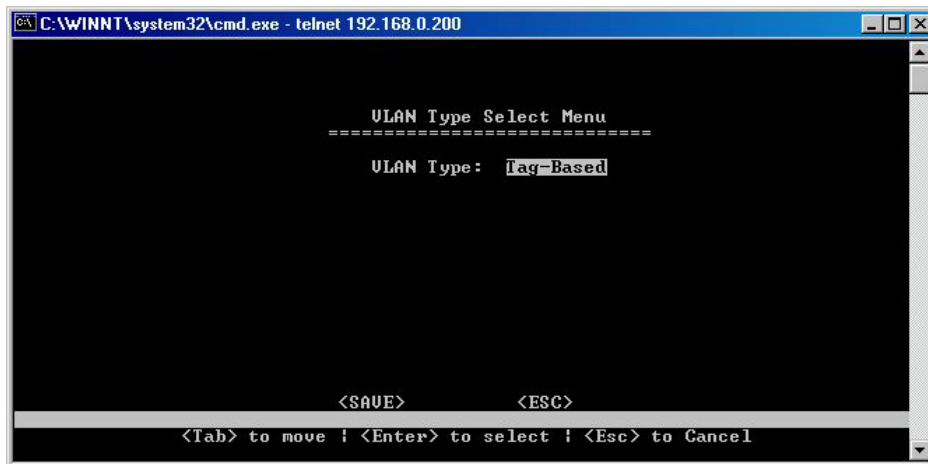


Figure 31: VLAN Type Select Menu

Disable VLAN or select Port-based VLAN or Tag based VLAN.

SS13 – Port based VLAN configuration

The following is the menu screen for port based VLAN configuration:

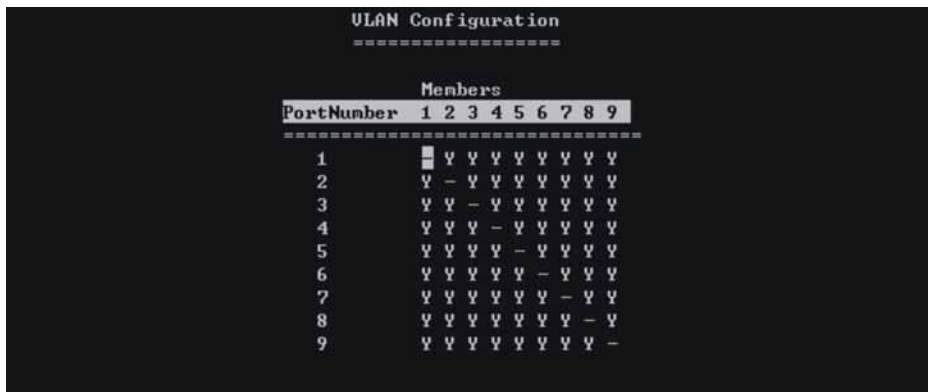


Figure 32: VLAN Configuration

Table 17: VLAN Configuration

Parameter	Description
Port ID Members	Set the VLAN association of one port to another. Blank checks mean no VLAN association. The default is that all ports are associated. Conversely, all ports can be isolated.

Use the [Tab] key to move from one field to the next and the [Enter] key to select and unselect. Press [Enter] to exit the field. Select [SAVE] after editing, or [ESC] to return to the Main Menu system (all unsaved work will return to default or last saved values).

8.3.5.2 Tag-based VLANs

The concepts of tag-based VLAN

Tag-based VLAN is the standard implementation of IEEE802.1Q VLAN. With the Industrial Managed Switch set as a tag-based VLAN switch, every port has the following:

PVID

Port VLAN ID number, generally referring to the VLAN, which the connected non-802.1Q-aware device (like a Device Server or Industrial Computer) belongs to. This PVID can be configured in the menu **Port Information**.

Priority

Priority of the port and the non-802.1Q packets received on the port – generally from a non-802.1Q-aware device. (**Port Info** menu)

Participating VLANs

The VID-tagged packets, which are allowed to flow in or out of the port. A port may participate in multiple VLANs, like an uplink port connected to another switch, which will transfer the packets from various devices belonging to different VLANs into the network. (BUT, generally, a port connected to a peripheral non-802.1Q device can only participate in 1 VLAN, the same VLAN ID that is selected for that port in the “Port Info” menu). The participating VLANs can be configured in the menu **Add VLAN Group**.

If the port is set in the **Add VLAN Group** menu as a Tagged Port, all packets flowing out of the port will be tagged frames to an 802.1Q switch or device.

If the port is set as an Untagged Port, all packets out of the port will be untagged frames (stripped of their tags at port) to a non-802.1Q device, like an industrial computer.

When a packet is received (ingress) on the port, it is filtered to be dropped or forwarded according to the user-specified rule (configured on menu “Port Information”) for ingress-filtering untagged frames and tagged frames that are not members of the receiving port’s participating VLANs (configured on menu **Add VLAN Group**).

If the packet is forwarded, the untagged frames, generally from a non-802.1Q-aware peripheral or device, are tagged with the PVID and Priority that were assigned to the Ingress port.

The untagged packets received by an 802.1Q Switch in this way become tagged frames. The tagged frames received on the ingress port are kept unchanged if it's not dropped.

Next, the Industrial Managed Switch switches the frame into the egress port that is a participant of that specific VLAN.

For example: If the ingress is from a peripheral device linked to a downlink port on a switch with only one uplink port and the frame is addressed to a device on another switch, the frame would be switched to egress out of the uplink port – and this UPLink port would be set to participate in the VLANs of all the DOWNlink ports and forward all their traffic.

If the egress port is an “untag” port (normally a port linked to a peripheral, non-802.1Q device that does not accept tagged frames), the VID and priority fields will be stripped off (untagged) from the frame and then transmitted out of the egress port.

A previously tagged frame is simply kept unchanged when it is sent out from a “tagging” egress port, generally to a 802.1Q switch or a standard VLAN-aware device.

VLAN Tag Menu

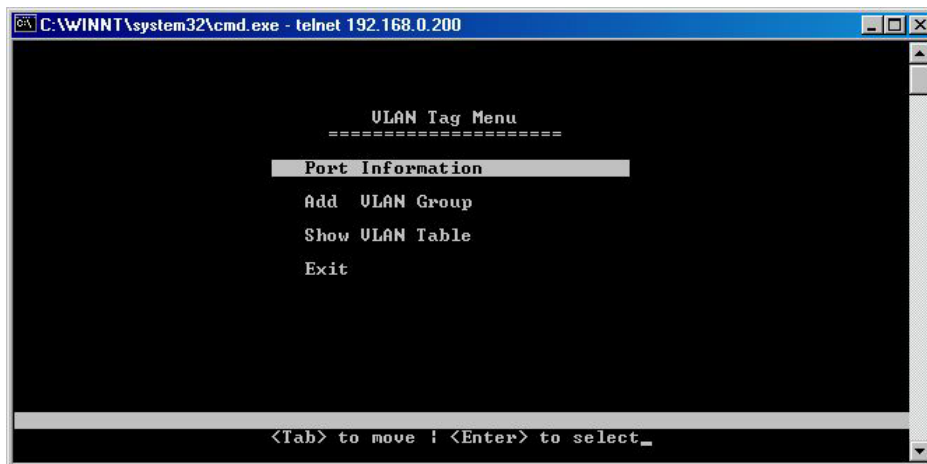


Figure 33: VLAN Tag Menu

SS14 – VLAN Tag-based Port (Ingress) – Info

Here is the above-mentioned menu screen for configuring the TAG-based VLAN port settings (INGRESS Behavior).

```

          Tag-Based VLAN Port-Info
          =====
          Port      PVID      Pri      IngressFilter1      IngressFilter2      Isolated
          NonMember Pkt      Untagged Pkt
          -----
          PORT1:    1          0        Drop                 Forward              Disable
          PORT2:    1          0        Drop                 Forward              Disable
          PORT3:    1          3        Drop                 Forward              Disable
          PORT4:    1          0        Drop                 Forward              Disable
          PORT5:    1          0        Drop                 Forward              Disable
          PORT6:    1          0        Drop                 Forward              Disable
          PORT7:    1          0        Drop                 Forward              Disable
          PORT8:    1          0        Drop                 Forward              Disable
          PORT9:    1          0        Drop                 Forward              Disable
  
```

Figure 34: Tag-Based VLAN Port-Info

Table 18: Tag-Based VLAN Port-Info

Parameter	Description	
VID	Set the VLAN ID. The limit given is between 1 and 4095. The VLAN ID is assigned to all untagged frames received on this port.	
Priority	Set VLAN Priority. The limit given is between 0 ... 7. 0 is the lowest priority and 7 is the highest priority.	
Ingress Filter 1 (Non-Member) and Filter 2 (Untagged)	<p>Non-Member (1): Forward Untagged (2): Forward</p> <ul style="list-style-type: none"> Forward the VLAN-tagged frames which are not members of any VLAN in which the port is participating, and forward all untagged frames. <p>Non-Member (1): Drop Untagged (2): Forward</p> <ul style="list-style-type: none"> Drop the VLAN-tagged frames which are not members of any VLAN of which the port is participating, and forward all untagged frames. <p>Non-Member (1): Drop Untagged (2): Drop</p> <ul style="list-style-type: none"> Drop the VLAN-tagged frames which are not members of any VLAN of which the port is participating, and drop all untagged frames. 	
Isolated	Enable	The port is isolated. Isolated ports belonging to the same VLAN do not communicate with each other – this is generally set for security reasons. The isolated ports communicate only with the trunk ports, which should NOT be set as “isolated”.
	Disable	The port is not isolated and can communicate with all ports of the VLANs.

VLAN Table

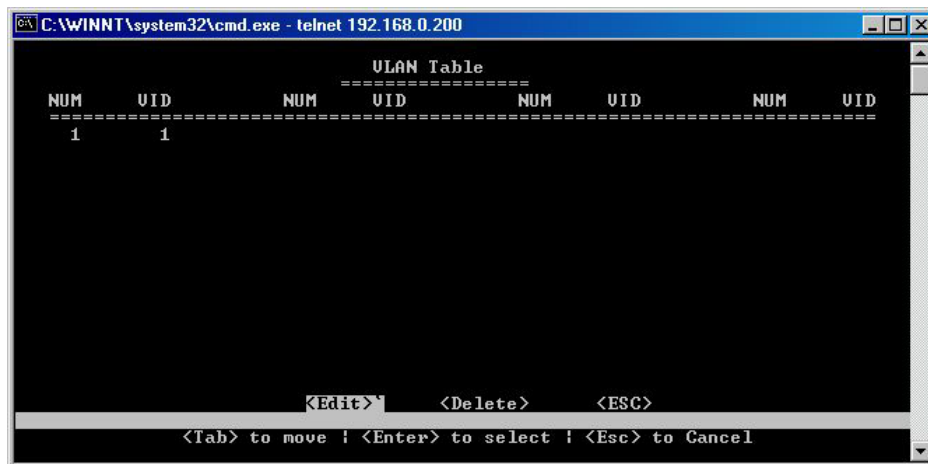


Figure 35: VLAN Table

SS15 – Tag-based/Adding VLAN groups (port EGRESS behavior)

Type in VLAN ID number and at each port select “**No**” (not a member of this specific VLAN – drop packet), “**Untagged**” (member of VLAN, take tag away so that computer can read) or “**Tagged**” (keep tag on packet – only for uplink port). The menu **Show VLAN Table** shows all VLANs at a glance and enables the user to edit these VLANs.



Figure 36: Add VLAN Group

SS16 – (DCM)/Jumbo Packet or Rate Control Configuration

```

Jumbo Packet / Rate Control Configuration
=====
Jumbo Packet Length : 1536 [1522|1536]Bytes

Port  Ingress Limit Mode          Ingress-Rate  Egress-Rate(All Frames)
-----
PORT1 Multi/Broadcast & Flooded unicast 256Kbps       256Kbps
PORT2 Multicast & Broadcast Only    512Kbps       Not limited
PORT3 Broadcast Only                1Mbps         Not limited
PORT4 Multi/Broadcast & Flooded unicast 8Mbps         Not limited
PORT5 All Frames                    Not limited   1Mbps
PORT6 All Frames                    Not limited   Not limited
PORT7 All Frames                    Not limited   Not limited
PORT8 All Frames                    Not limited   Not limited
    
```

Figure 37: Jumbo Packet

Use the **[Tab]** key to move from one field to the next and the **[Enter]** key to select and unselect. Press **[Enter]** to exit the field. Select **[SAVE]** after editing, or **[ESC]** to return to the Main Menu system (all unsaved work will return to default or last saved values).

Table 19: Jumbo Packet

Parameter	Description
Jumbo Packet Length	Select the size of packets: 1535 – For double-tagged packets or jumbo packets 1522 – For normally tagged packets. 1518 bytes are actually allowed for untagged packets.
Ingress Limit Mode	Users can select the type of frames allowed from the port (All Frames, Broadcast Only, Multicast & Broadcast Only, Multi/Broadcast & Flooded Unicast).
Ingress / Egress Rate	Assign the Ingress and Egress rates to and from the ports (128 Kbps, 256 Kbps, 512 Kbps, 1 Mbps, 2 Mbps, 4 Mbps, 8 Mbps).

SS17 – (DCM)/Port Mirroring

port. It allows the network administrator to “sniff” the observed port and thus keep tabs on network activity.

Use the **[Tab]** key to move from one field to the next and the **[Enter]** key to select and unselect. Press **[Enter]** to exit the field. Select **[SAVE]** after editing, or **[ESC]** to return to the Main Menu system (all unsaved work will return to default or last saved values).

```

Port Mirror Configuration
=====
Mirror Mode : Ingress & Egress
Monitoring Port : PORT3
Monitored Port :

Port      Member
-----
PORT1    V
PORT2    -
PORT3    -
PORT4    V
PORT5    -
PORT6    -
PORT7    -
PORT8    V

<SAVE>    <ESC>

```

Figure 38: Port Mirror Configuration

Table 20: Port Mirroring

Parameter	Description
Mirror Mode	Select mirror mode (Disable, Ingress & Egress, Ingress)
Monitoring Port	User can select the port number that will do monitoring
Monitored Port / Member	Select the port/s that need to be monitored

SS18 – (DCM)/Trunk Configuration



Figure 39: Trunk Configuration

Use the usual keys to configure up to four trunk groups.

(DCM)/IGMP Configuration

Select this menu and select between Configuration and Group Status:

IGMP Menu

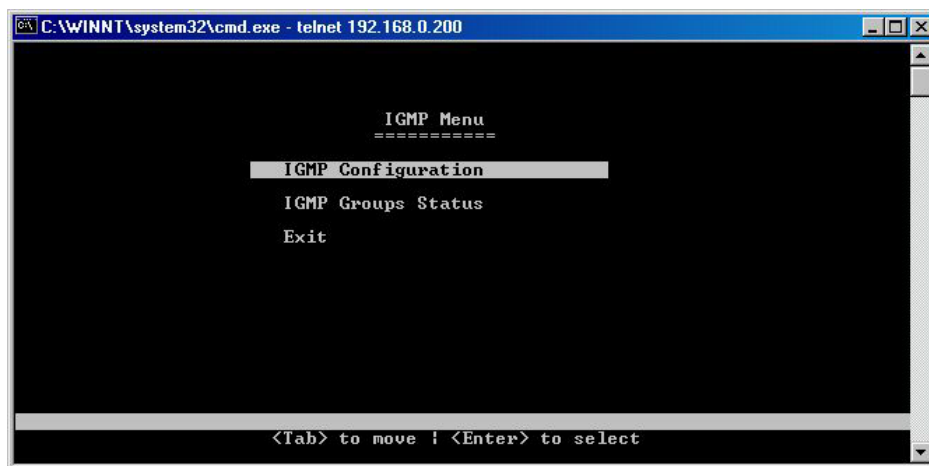


Figure 40: IGMP Menu

SS19 – (DCM)/IGMP Configuration

```

IGMP Configuration
=====
IGMP snooping:  Disable
IGMP query:     Auto
IGMP static:

PORT            Member
-----
PORT1           -
PORT2           -
PORT3           -
PORT4           -
PORT5           -
PORT6           -
PORT7           -
PORT8           -

```

Figure 41: IGMP Configuration

Select between IGMP Snooping (Disable/Enable), IGMP Query (Auto, Enable, Disable) and IGMP static per port (Y/_).

SS20 – IGMP Groups Status

```

IGMP Groups status
=====
No. Multicast Group Vid 12345678 M:Member
Q:Query

```

Figure 42: IGMP Groups status

View status of IGMP groups (only accessible if Snooping is enabled).

SS21 – (DCM)/MAC Configuration

```

MAC Configuration
=====
MAC Table
Lock MAC Address Learning
Static MAC Configuration
MAC Limit Configuration
Exit

```

Figure 43: MAC Configuration

Select field to configure.

SS22 – MAC Table

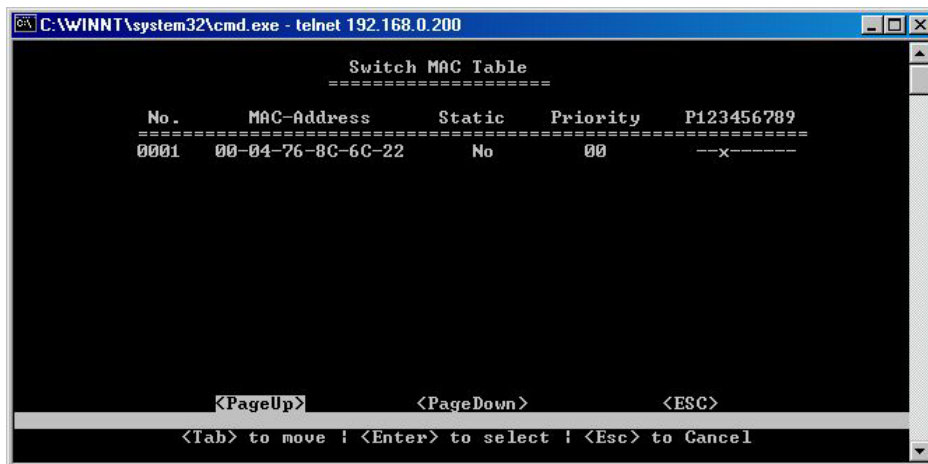


Figure 44: MAC Table

View MAC address information.

Lock MAC Address Learning

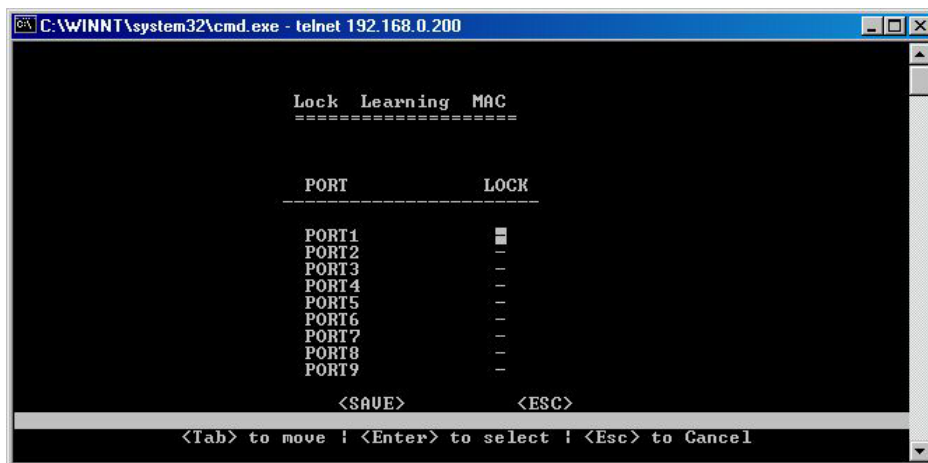


Figure 45: Lock MAC Address Learning

Select if you want to put this lock on a port (choose Y/_ per port).

SS23 – Static MAC Configuration

No.	MAC-Address	Priority	Port
001	01.02.03.04.05.06	2	3

<PageUp> <PageDown> <Add> <Delete> <ESC>

Figure 46: Static MAC Configuration

SS24 – Add Static MAC

(Appears when you select **Add** in previous window.) When cursor is on **[ESC]**, pressing **[Enter]** will give extra options: **Add/SC** – press **[Tab]** key twice to get **[ESC]**.

MAC Address	:01.02.03.04.05.06	(Example:01.02.03.04.05.06)
Priority	:2	(0~3)
Port	:3	(1~8)

Figure 47: Add Static MAC

SS25 – MAC Limit Configuration

Port	Limit Quantity	Action
PORT1	5	Disable
PORT2	5	Disable
PORT3	5	Enable
PORT4	20	Enable
PORT5	5	Disable
PORT6	5	Disable
PORT7	5	Disable
PORT8	5	Disable

<SAVE> <ESC>
SAVE is OK!!!

Figure 48: MAC Limit Configuration

SS26 – (DCM)/Quality of Service

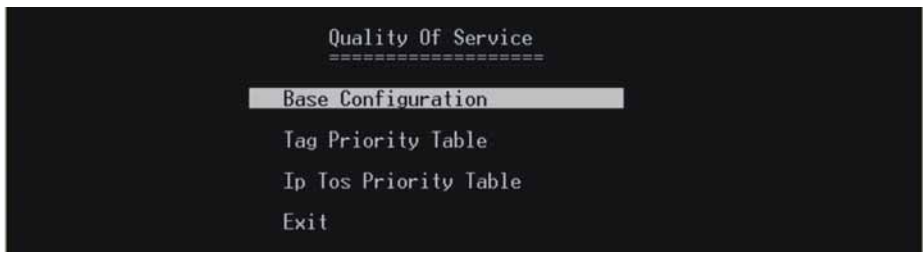


Figure 49: Quality of Service

SS27 – QoS Base Config.

(weighted fair queuing OR all high before low)

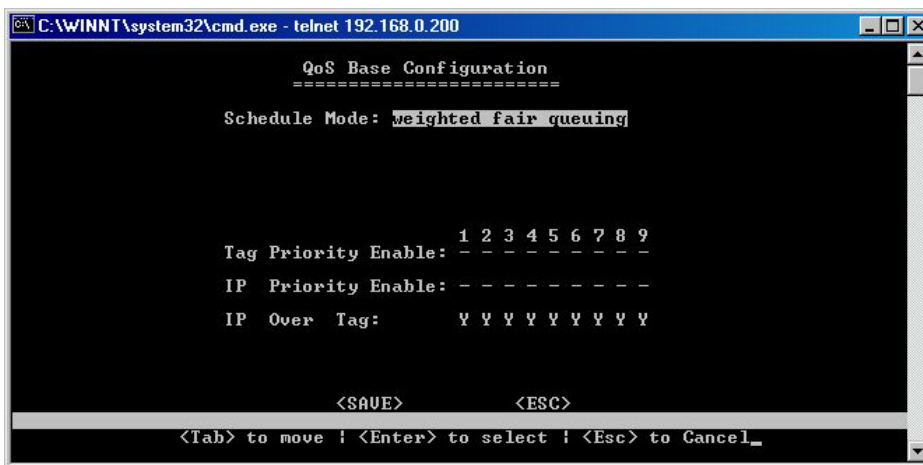


Figure 50: QoS Base Configuration

SS28 – (DCM)/QOS/Tag Priority Table

Tag Priority Table	
Number	Priority
0	Preferred
1	High
2	Normal
3	Low
4	Preferred
5	Low
6	Low
7	Low

Figure 51: QoS Tag Priority Table

SS29 IP ToS Priority Table

Ip Tos Priority Table																
Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Priority	Hig	Nor	Pre	Pre	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Number	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Priority	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Number	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Priority	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Number	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Priority	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

(Tab) to move, (Enter) to select, (Esc) to Cancel

Figure 52: ToS Priority Table

8.3.6 Management Setup Menu (MSM)

After logging into the system, you can use this menu to configure the settings for remote access via SNMP agent and to configure the e-mail alarm or to upgrade the firmware. The user should set the community string that controls access to the onboard SNMP agent via in-band management software (SNMP Configuration). The items provided by the Management Setup Menu are described in the following sections.

SS30 – Management Setup Menu (MSM)

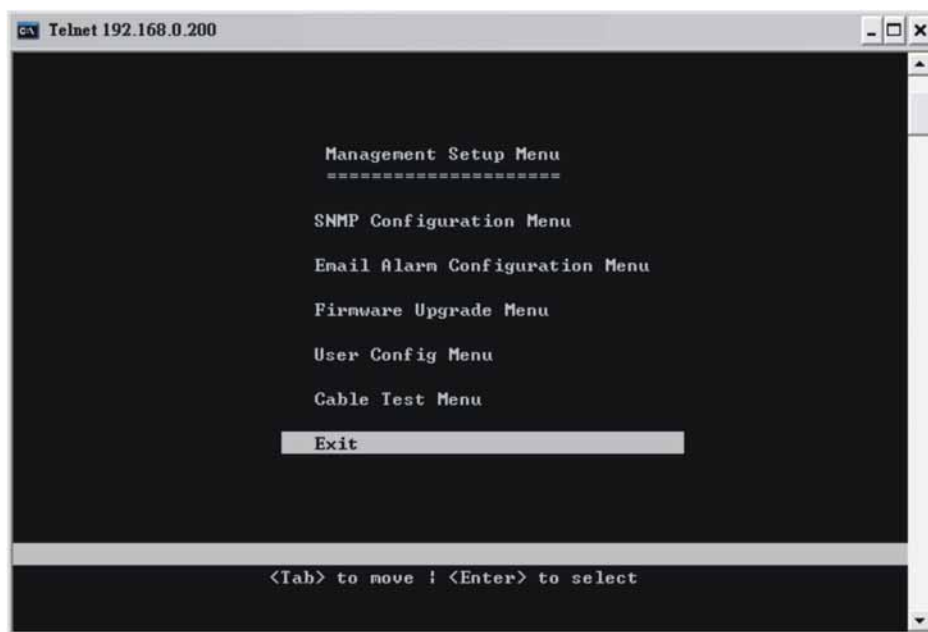


Figure 53: Management Setup Menu

Use the **[Tab]** key to move from one field to the next and the **[Enter]** key to select.

(MSM)/SNMP Configuration Menu

Use the SNMP Configuration screen to display and modify parameters for the Simple Network Management Protocol (SNMP). The Switch features an onboard SNMP agent that monitors the status of its hardware as well as the traffic passing through its ports. A computer attached to the network, called a Network Management Station (NMS), can be used to access this information. Community strings control access rights to the agent module. To communicate with the switch, the NMS must first submit a valid community string for authentication. The options for configuring community strings and related trap functions are described in the following figures and tables.

SS31 – (MSM)/SNMP Configurations

```

C:\WINNT\system32\cmd.exe - telnet 192.168.0.200

SNMP Configuration
=====
System Name   : 852-104
Location     : WAGO Corporation
Contact name  :
Get Community : public
Set Community : private

[SNMP Trap]

Index Status IP address Community
---
1 Enabled 192.168.0.200 public
2 Disabled 0.0.0.0 public
3 Disabled 0.0.0.0 public
4 Disabled 0.0.0.0 public
5 Disabled 0.0.0.0 public

<SAUE> <ESC>

<Tab> to move ! <Enter> to select ! <Esc> to Cancel.

```

Figure 54: SNMP Configuration

Use the [Tab] and [Enter] keys as previously. Enter the IP addresses of computers that will be notified when abnormalities on a connection occur and an alarm needs to be sent. Enter their community names and disable or enable their alarm function.

Table 21: SNMP Configuration

Parameter	Description
Index	Number assigned to each trap
Status	Disable or enable the alarm function
IP Address	Enter the IP addresses of computers that will be notified when abnormalities on a connection occur and an alarm needs to be sent. Enter their community names and disable or enable their alarm function.
Community	Enter their community names

You can use an external SNMP-based application to configure and manage the Switch. This management method requires the SNMP agent on the Switch and the SNMP Network Management Station to use the same community string. This management method, in fact, uses two community strings: the GET community string and the SET community string. If the SNMP Network Management Station only knows the SET community string, it can read and write to the MIBs. However, if it only knows the GET community string, it can only read MIBs. The default GET and SET community string for the Switch is “**public**”.

SS32 – (MSM)/E-mail Alarm Configuration

The Industrial Managed Switch instantaneously issues e mail warnings to engineers when an exception occurs. Users can also connect a relay output to the Switch’s terminal block to enable an acoustic alarm e.g. (please see hardware configurations for detail).

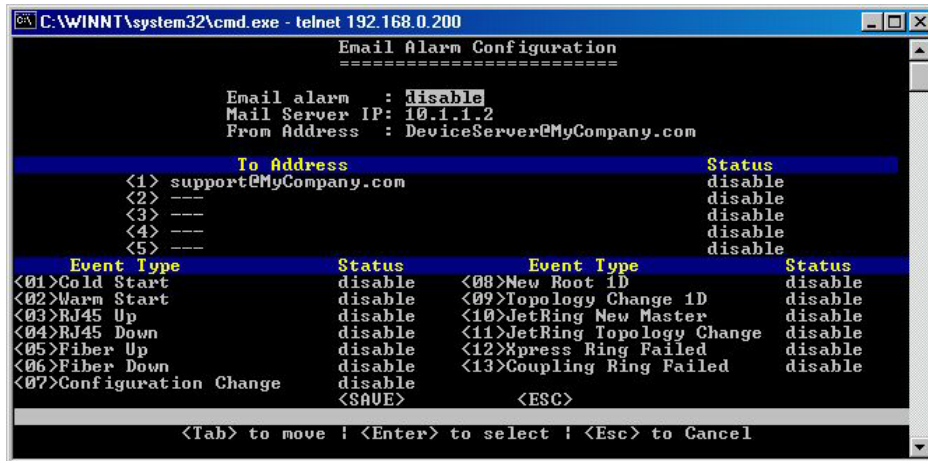


Figure 55: eMail Alarm Configuration

Use the [Tab] and [Enter] keys as previously. The user must Enable the E-mail Alarm function and provide the valid IP address of the mail server, which the Switch will use and a valid e-mail address for the Switch. The user can select up to five (5) e-mail addresses that error messages will be e mailed to. Provide the valid address and “Enable” the status. The user must then select which exceptions will trigger an e-mail alert.

Table 22: eMail Alarm Configuration

Parameter	Description
E-mail Alarm	Enable/Disable
Mail Server IP	Provide valid IP address of Mail Server
From Address	Assign an e-mail address to the Switch (E.g. Industrial Managed Switch@xxxxxx)
To Address	Provide the e-mail address(es) to which e-mail alarms should be sent. Remember to enable their statuses.
Event Type	Enable the events for which you want to receive an e-mail alert.

SS33 – (MSM)/Firmware Upgrade Menu

The firmware for the Industrial Managed Switch can also be upgraded via TFTP if such a file has been prepared. Create a TFTP server and upload into it the new firmware file that will be downloaded. This feature helps users to keep updating the firmware with new/enhanced features. For example:

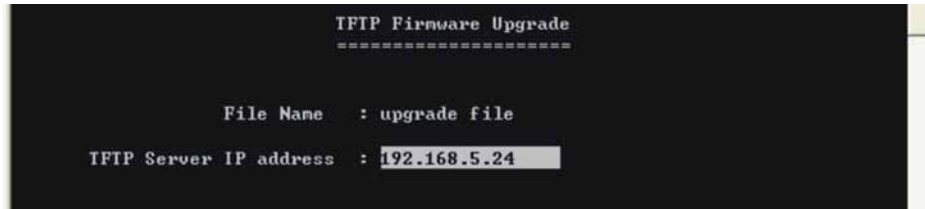


Figure 56: Firmware Upgrade

Use the **[Tab]** to move up and down the menu, and the **[Enter]** key to select and unselect, or **[ESC]** to cancel.

Choose the following operations from the menu system:

Table 23: Firmware Upgrade

Parameter	Description
File Name	Enter a file name for new firmware
IP address	Enter IP address of a TFTP server.
Start Upgrade	Select to upgrade firmware

The Industrial Managed Switch will download the file and restart to affect the new settings.

SS34 – (MSM)/User Configuration Menu

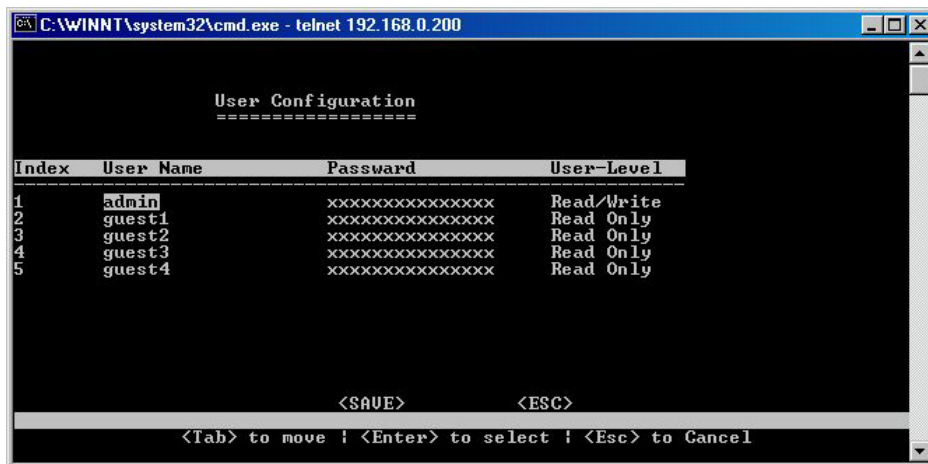


Figure 57: User Configuration

SS35 – (MSM)Cable Test Menu

Cable Test is used to diagnose the physical copper links connected each port, by separate pairs in a cable. If the link is well connected, the Status column will show **“normal”**. If the link is disconnected, the Status column will show **“open”**, and the Cable Length column will display the estimated distance from the port to the location where the circuit is open.

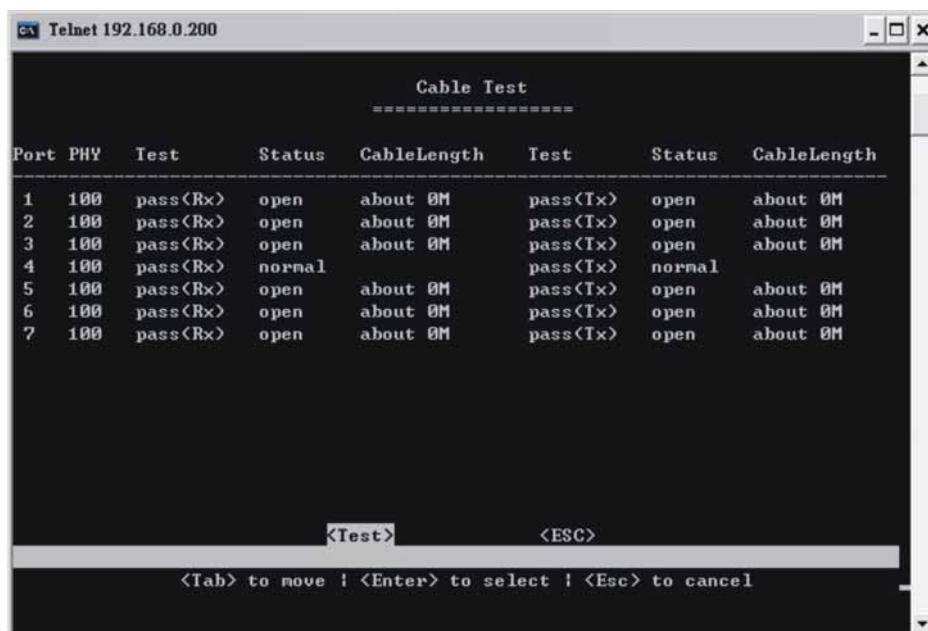


Figure 58: Cable Test Menu

SS36 – Main Menu/Port Counter Menu

The user can view the port's statistics from this screen.

Port	TxGoodPkt	TxBadPkt	RxGoodPkt	RxBadPkt	TxAbort	Collision	DropPkt
PORT1	0	0	0	0	0	0	203926
PORT2	169747	0	41904	0	0	0	0
PORT3	0	0	0	0	0	0	203927
PORT4	0	0	0	0	0	0	203927
PORT5	0	0	0	0	0	0	203927
PORT6	0	0	0	0	0	0	203927
PORT7	0	0	0	0	0	0	203930
PORT8	167536	0	0	0	0	0	36392
PORT9	0	0	0	0	0	0	203928

<Clear> <ESC>

<Tab> to move | <Enter> to select | <Esc> to Cancel

Figure 59: Port Counter

Table 24: Port Counter

Parameter	Description
Port	Port Number
TxGoodPkt	Good packets transmitted by the port
TxBadPkt	Bad packets transmitted by the port
RxGoodPkt	Good packets received by the port
RxBadPkt	Bad packets received by the port
TxAbort	Transmission aborted by/from the port
Collision	Packet collision information
DropPkt	Number of packets dropped by the port

SS37 – Main Menu/System Restart Menu

Users can remotely restart the Switch or reset the Switch to factory default settings via software without turning OFF the power.

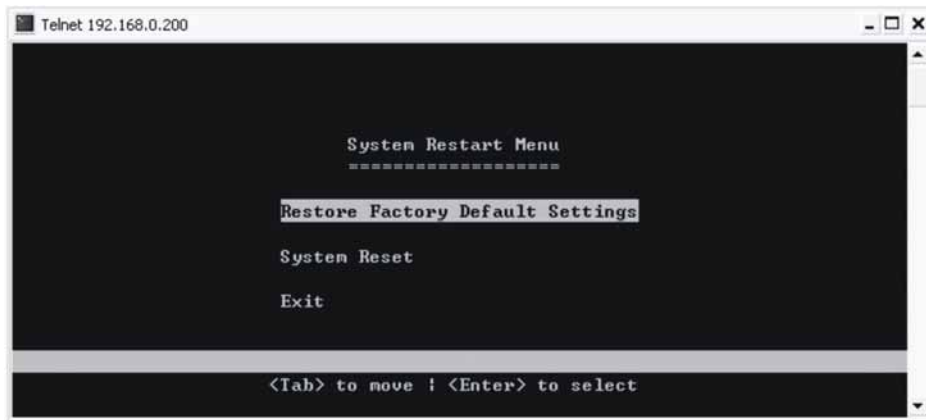


Figure 60: System Restart Menu

Note



Please note

If you highlight either „**Restore Factory Settings**“ or „**System Reset**“ and press **[Enter]**, the reset will commence immediately!

Note



Please note

If you press **[Enter]** when on the “**Restore**” field will set the switch back to factory defaults immediately, all saved configurations will be lost!

Use the **[Tab]** to move up and down the menu, and the **[Enter]** key to select. Choose the following operations from the menu system:

Table 25: System Restart Menu

Parameter	Description
System Restore Factory Default Settings	Pressing [Enter] when on the Restore field will set the switch back to factory defaults IMMEDIATELY.
System Reset	Press [Enter] when on the “ Reset ” field to reboot the switch. After rebooting, it is necessary to log in again
Exit	Exits menu and returns to Main Menu

8.4 C – Using the Internet Browser Interface

8.4.1 Overview

This section gives a step-by-step guide to configuring the Industrial Managed Switch's management functions. A series of screen shots (SS#) and instructions illustrate the main menu structure and how it works.

Firstly, open a web browser and key in the Switch's IP address – then press [Enter]. A Web Manager page like this will pop up on your screen:

SS1 – Log in

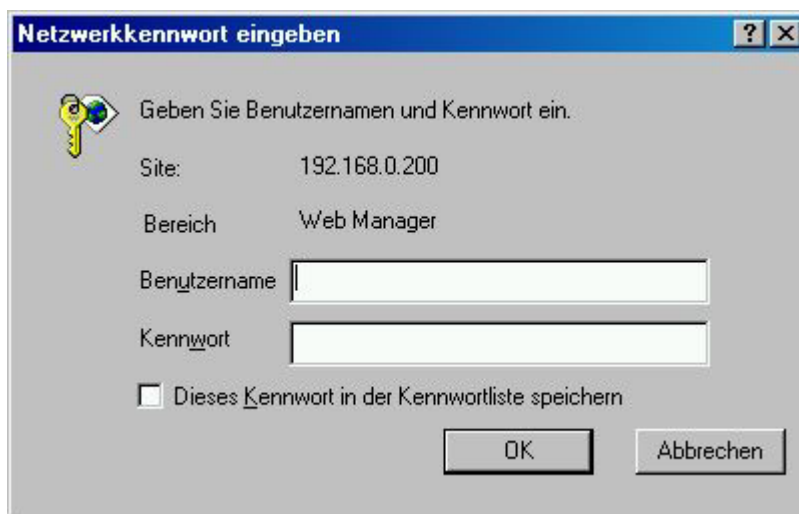


Figure 61: Log-in

The default username is: **admin**

There is no preset password for this module, so click on [OK] to proceed.

8.4.2 System Details

When your Web browser connects with the Industrial Managed Switch's Web agent, the home page is displayed as shown below. The home page displays the Main Menu on the left side of the screen and System Information as the main page. The Main Menu links are used to navigate to other menus and display configuration parameters and statistics.

SS2 – Homepage (System Detail/System Info)

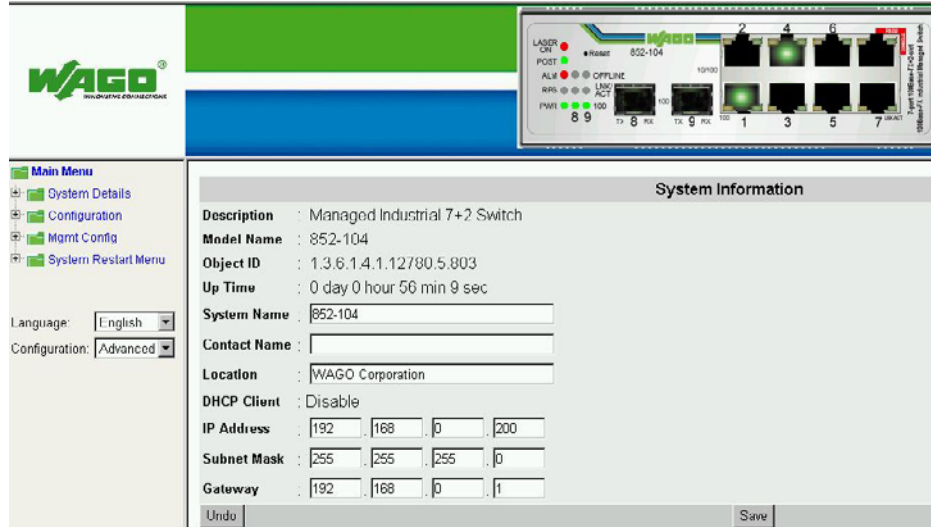


Figure 62: Homepage

Click on each parameter field to modify the specific settings, click **[Undo]** to restore previously saved configurations or click **[Save]** to retain newly entered information. See description below:

Table 26: Homepage

Parameter	Description
Description	Provides description of the Switch
Object ID	ID or Serial number
Up Time	Provides information on up time, or the time that the system has been operating
System Name	Modify the name of the Switch here
Contact	Enter a contact name
Location	Enter the location of Switch
DHCP Client	Disabled or client's name
IP Address	Default: 192.168.100.1
Subnet Mask	Default: 255.255.0.0
Gateway	Default: 192.168.0.1



Note

Please note

The above are factory defaults used as an example only. A new address is important. Choose numbers between 0 and 254 in each sub-address field. Make a note of them and keep the details in a safe place.

SS3 – Board Info

Board Information
Hardware Version : 6700-00803-1101
Firmware Version : 2.01.08 (built at Mar 20 2008 20:03:54)
Part Number : 9

Figure 63: Board Information

Table 27: Board Information

Parameter	Description
Hardware Version	Provides information on the hardware version
Firmware Version	Provides information on the firmware version
Port Number	Provides information on the number of ports available

SS4 – DHCP Configuration

DHCP Configuration
DHCP Client : <input type="text" value="Disable"/>
DHCP Client State :
DHCP Leased Time : 0 seconds
DHCP Expiry Time : 0 seconds
<input type="button" value="Undo"/> <input type="button" value="Save"/>

Figure 64: DHCP Configuration

8.4.3 Configuration

Port Configuration

This section allows you to view and change the parameter settings for the individual ports on the Industrial Managed Switch. See screen shot and table below for adjustable parameters.

SS5 – Config./Port Configuration

Port	Name	Type	Admin	Speed		Duplex		Link	AUTO	Flow-Control
				Status	Setting	Status	Setting			
UTP-1		RJ45	Enable	10M	100M	Half	Full	Up	Enable	Enable
UTP-2		RJ45	Enable	10M	100M	Half	Full	Down	Enable	Enable
UTP-3		RJ45	Enable	10M	100M	Half	Full	Down	Enable	Enable
UTP-4		RJ45	Enable	100M	100M	Full	Full	Up	Enable	Enable
UTP-5		RJ45	Enable	10M	100M	Half	Full	Down	Enable	Enable
UTP-6		RJ45	Enable	10M	100M	Half	Full	Down	Enable	Enable
UTP-7		RJ45	Enable	10M	100M	Half	Full	Down	Enable	Enable
Fiber-8		Fiber	Enable	100M	100 M	Full	N/A	Down	N/A	Enable
Fiber-9		Fiber	Enable	100M	100 M	Full	N/A	Down	N/A	Enable

Undo Save

Figure 65: Port Configuration / Advanced Control

Click on each parameter field to modify the desired setting, then click on **[Undo]** to restore previously saved configurations or click on **[Save]** to retain newly entered information. See description below:

Table 28: Port Configuration

Parameter	Description	
Port	Port types and numbers.	
Name	Assign a names to each port to keep record of your connections.	
Type	Type of connector for each port (auto-detects fiber and RJ-45).	
Admin	Enable or disable admin configurations.	
Speed	Status	Provides information on speed at which ports are currently operating.
	Setting	Set speed for RJ-45 ports. (The speed for fiber ports is fixed).
Duplex	Status	Provides information on Duplex Status.
	Setting	Select half /full duplex modes.
Link	Provides information on link status.	
AUTO	Enable/Disable Auto negotiation on copper ports.	
Flow Control	Enable/Disable flow control for each port.	



Note

Please note

Disable the auto (auto negotiation) function to configure speed and duplex. Click on **[Undo]** to restore previously saved configurations or click on **[Save]** to retain newly entered information.

SS6 - Port Status

Ports Status								
Port	Name	Type	Admin	Speed	Duplex	Link	Auto	Flow Control
UTP-1		RJ45	Enabled	10M	Half	Up	On	Enabled
UTP-2		RJ45	Enabled	10M	Half	Down	On	Enabled
UTP-3		RJ45	Enabled	10M	Half	Down	On	Enabled
UTP-4		RJ45	Enabled	100M	Full	Up	On	Enabled
UTP-5		RJ45	Enabled	10M	Half	Down	On	Enabled
UTP-6		RJ45	Enabled	10M	Half	Down	On	Enabled
UTP-7		RJ45	Enabled	10M	Half	Down	On	Enabled
Fiber-8		Fiber	Enabled	100M	Full	Down	N/A	Enabled
Fiber-9		Fiber	Enabled	100M	Full	Down	N/A	Enabled

Figure 66: Port Status

This window offers at-a-glance status reporting for Switch operations. Click on the Port Configurations button to return to the Port Configurations window if you need to change a setting.

SS7 – RMON Status

The user can view the details of packet transmission and reception at each port. Select the port number (1 ... 9) to see the port details.

RMON			
Slot Number : <input type="text" value="1"/> <input type="button" value="Clear"/>			
RX			
Unicasts	0	Broadcasts	0
Pause	0	Multicasts	0
FCSErr	0	AlignErr	0
GoodOctets	0	BadOctets	0
Undersize	0	Fragments	0
64 Byte Frames	0	65-127 Byte Frames	0
128-255 Byte Frames	0	256-511 Byte Frames	0
512-1023 Byte Frames	0	MaxOctets	0
Jabber	0	Oversize	0
Discards	0	Filtered	0
TX			
Unicasts	0	Broadcasts	999
Pause	0	Multicasts	47
FCSErr	0	GoodOctets	90539
64 Byte Frames	726	65-127 Byte Frames	219
128-255 Byte Frames	101	256-511 Byte Frames	0
512-1023 Byte Frames	0	MaxOctets	0
Collisions	0	Late	0
Excessive	0	Multiple	0
Single	0	Deferred	0
Discards	2		

Figure 67: RMON Status

8.4.4 Bridge Menu

Using the Bridge Menu

The Bridge menu is used for configuring the Jet Ring, Spanning Tree Algorithm and Xpress Ring settings, as well as the traffic class priority threshold and the address aging time.

The Jet Ring offers fast recovery time of less than 300 ms in case of link failure (if Jet Ring is enabled). It has a longer recovery time than Xpress Ring (50 ms), but it needs almost no set-up configuration.

Xpress Ring offers a very fast link-failure recovery time of 50 ms, but the user must select the role of the Switch (arbiter or forward) and which two ports will be part of the Xpress Ring network.

The Spanning Tree Algorithm is used for detecting and disabling network loops, and to provide backup links between switches, bridges or routers. This allows the switch to communicate and interact with other bridging devices (i.e. STA-compliant devices) in a network to ensure that only one route exists between any two stations, and it provides redundant or backup links that automatically take over when a primary link goes down.

SS8 - Bridge Configuration



Figure 68: Bridge Configuration

Table 29: Bridge Configuration

Parameter	Description
Disabled	Disable redundancy function
STP (802.1D)	Redundant link via Spanning Tree Protocol
Jet Ring	Redundant link with fast recovery time of less than 300 ms
Xpress Ring	Redundant link with fastest recovery time: less than 50 ms

Select the appropriate mode as per the network needs, then click on **[Save]** to retain newly entered information or click on **[Undo]** to restore previously saved configurations.

SS9 – (Bridge)/STP System Configuration

This screen allows the user to enter the STP parameters for the Switch. Please note: users must select “**STP 802.1D**” under **Bridge Configuration** to perform this configuration. Otherwise, this option will not be accessible.

STP System Configuration	
Root Bridge Information	
Bridge Priority :	32768
MAC Address :	0030deff9e61
Root Path Cost :	0
Root Port :	0
Hello Time :	2
Forward Delay :	15
Max age :	20
Configure Spanning Tree Parameters	
Bridge Priority :	<input type="text" value="32768"/> (Limit 0~65535)
Hello Time :	<input type="text" value="2"/> (Limit 1~10)
Forward Delay :	<input type="text" value="15"/> (Limit 4~30)
Max age :	<input type="text" value="20"/> (Limit 6~40)
<input type="button" value="Undo"/>	<input type="button" value="Save"/>

Figure 69: STP System Configuration

Enter the appropriate entries, then click on [**Save**] to retain newly entered information or click on [**Undo**] to restore previously saved configurations.

Table 30: STP System Configuration

Parameter	Description
Bridge Priority	Set the bridge priority. The limit is given between 0 (the highest priority) and 65535 (the lowest priority). Bridge priority is used in selecting the root device, root port, and designated port. The device with the highest priority becomes the STA root device. However, if all devices have the same priority, the device with the lowest MAC address will then become the root device.
Hello Time	Time interval (in seconds) at which the root device transmits a configuration message. The limit given is from 1 ... 10 s.
Forward Delay	Set Forward Delay. The limit given is from 4 ... 30 s. This is the maximum time (in seconds) the root device will wait before changing states (i.e., listening to learning to forwarding).
Max age	Set the (maximum age) waiting time for receiving packets before attempting to reconfigure the link. The limit given is from 6 ... 40 s.

SS10 – (Bridge)/STP Per-Port Configuration

STP allows the Switch to assign a priority status to each of its ports, with respect to other networking nodes in the network. In other words, STP determines the best route for data to flow, given the priority level of each node on the network. Ensure that this function is activated to avoid collisions and when setting up backup links.

Spanning Tree Port Configuration					
Port	Type	Priority(1-255)	Cost(1-65535)		Port Role
1	RJ45	128	19		Forwarding
2	RJ45	120	19		Blocking
3	RJ45	128	19		Blocking
4	RJ45	128	19		Forwarding
5	RJ45	128	19		Blocking
6	RJ45	120	19		Blocking
7	RJ45	128	19		Blocking
8	Fiber	128	19		Blocking
9	Fiber	120	19		Blocking

Undo Save

Figure 70: Spanning Tree Port Configuration

Click on each parameter field to modify the desired setting, then click on **[Undo]** to restore previously saved configurations or click on **[Save]** to retain newly entered information. See description below:

Table 31: STP per Port Configuration

Parameter	Description
Port Type	RJ-45: Ethernet port Fiber: Fiber port
Port Priority (1 ... 255)	Set the priority of each port. The limit given is from 1 ... 255. The lowest number means highest priority. The default priority is set to 128 – the midpoint of this limit.
Cost (1 ... 65535)	Set the cost assigned to each port. This will determine the route of information flow. The higher the cost the less suitable the port is to be a node for the STP.
Port Role	Blocking the port is blocking by Spanning Tree Protocol Forwarding the port is forwarding

SS11 – (Bridge)/Jet Ring Status

Users can view the Jet Ring status after enabling the Jet Ring at the menu Bridge Configuration.

Jet Ring Status		
Master Bridge MAC :	00:30:de:ff:9e:61	
Jet Ring Total Nodes :	1	
Bridge Role :	Learning...	
Port No.	Port Role	Ring Port
PORT 1	Forwarding	
PORT 2	Disabled	
PORT 3	Disabled	
PORT 4	Forwarding	
PORT 5	Disabled	
PORT 6	Disabled	
PORT 7	Disabled	
PORT 8	Disabled	
PORT 9	Disabled	

Figure 71: JetRing Status

Table 32: JetRing Status

Parameter	Description
Master Bridge MAC	Display MAC address of the Switch in the Jet Ring.
Jet Ring Total Nodes	Number of Switches forming a Jet Ring
Bridge Role	The role of the Switch
Port Role	Display each port's role
Ring Port	Display which ports are ring ports

SS12 – (Bridge)/Xpress Ring Configuration

Xpress Ring Configuration	
Xpress Ring Role :	Forward
Select Ring Port 1 :	8
Select Ring Port 2 :	9
Port Status	
Ring PORT-1 State	Forwarding
Ring PORT-2 State	Forwarding
Undo	Save

Figure 72: XpressRing Configuration

Here you must set the Switch's role in the Xpress Ring network and the ports that will be part of the Xpress Ring. If the network's configuration changes (e.g. for a node failure or added switch) the MIS personnel has to make sure these settings are still valid – if the ring is set for Xpress Ring.

Table 33: XpressRing Configuration

Port	Configuration	
Xpress Ring Role	Arbiter	The Switch which receives status reports submitted from other Switches of the ring and decides the ring recovery behaviours.
	Forward	The Switch which is not the Arbiter of the ring and will forward the received status reports on the other side of ring ports.
Port status	Display the ring port statuses as: - Forwarding for packet transmitting and receiving status, or - Blocking for port disabled or link down status.	
Select Ring Port-1	The first ring port with the link composing part of the Xpress Ring.	
Select Ring Port-2	The second port with the link composing part of the Xpress Ring.	

8.4.5 Coupling Ring

Set Coupling Ring configurations to all Switches of either side of two interconnected Xpress Rings.

Figure 73: CouplingRing Configuration

Table 34: XpressRing Configuration

Port	Configuration	
Coupling Ring Role	Arbiter	The Switch with the backup secondary link to the peer Xpress Ring.
	Master	The Switch with the primary link to the peer Xpress Ring.
	Normal	The Switches not with the links connecting to peer Xpress Ring.
Select Control Port	The Control Port of Coupling Ring Master Switch or Arbiter Switch for communication with each other.	
Select Ring Port	The Ring Port of Coupling Ring Master Switch or Arbiter Switch for connection to the peer coupled Xpress Ring.	
Port State	Display the port status of Control Port or Ring Port as - Forwarding for packet transmitting and receiving status, or - Blocking for port disabled or link down status	

8.4.6 Virtual Local Area Networks (VLAN)

A VLAN is a network of computers behaving as though they are connected to the same segment, even though their physical location may be on a different segment of a LAN altogether. VLANs are configured through software rather than hardware, which makes them extremely flexible.

Some of the advantages of VLANs are:

- When a computer is physically moved to another location, it can stay on the same VLAN without any hardware reconfiguration because VLANs are not limited by hardware constraints.
- VLANs can be configured to define a network into various logical configurations. For example, VLANs can define a network by application. In this scenario, a company might create one VLAN for multimedia users and another for e mail users.
- VLANs can also define a network by department. For example, a company might have one VLAN for its Engineering Department, another for its Marketing Department, and another for its Sales Department.
- VLANs can also be set up according to the organization's internal structure. For example, the company president might have his/her own VLAN, the executive staff might have a different VLAN, and the remaining employees might have yet a different VLAN.

As these examples show, VLANs offer incomparable flexibility. The following section describes how VLANs can be deployed using the Switch.

SS13 – VLAN Type/(VLAN Configuration)

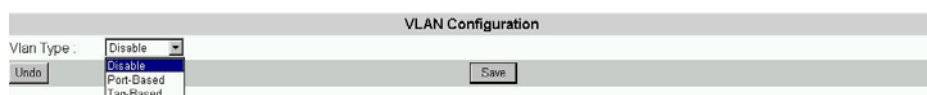


Figure 74: VLAN Configuration

The menu **Vlan Type** let users select the VLAN type of the Switch.

Table 35: VLAN Configuration

Parameter	Description
Disabled	The VLAN function is disabled.
Port-based	The VLAN function is enabled for Port-based VLANs.
Tag-based	The VLAN function is enabled for IEEE802.1Q VLANs

SS14 – Port-based VLAN Configuration

Port-Based VLAN Configuration									
Port Number	Port1	Port2	Port3	Port4	Port5	Port6	Port7	Port8	Port9
Port 1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Apply									
Port-Based VLAN Status									
Port Number	Port1	Port2	Port3	Port4	Port5	Port6	Port7	Port8	Port9
Port1	-	Y	Y	Y	Y	Y	Y	Y	Y
Port2	Y	-	Y	Y	Y	Y	Y	Y	Y
Port3	Y	Y	-	Y	Y	Y	Y	Y	Y
Port4	Y	Y	Y	-	Y	Y	Y	Y	Y
Port5	Y	Y	Y	Y	-	Y	Y	Y	Y
Port6	Y	Y	Y	Y	Y	-	Y	Y	Y
Port7	Y	Y	Y	Y	Y	Y	-	Y	Y
Port8	Y	Y	Y	Y	Y	Y	Y	-	Y
Port9	Y	Y	Y	Y	Y	Y	Y	Y	-

Figure 75: Port-Based VLAN Configuration

The Menu **Port-Based VLAN Configuration** is for configuration of Port based VLAN. It is enabled only when the VLAN Type is set as **Port based**.

At each port the user must click on the checkboxes of the ports to which the port is allowed to switch frames from the configured port. And then click on **[Save]** to retain newly entered information or click on **[Undo]** to restore previously saved configurations.

SS15 – Tag-Based VLAN Port Configuration (Tagging Base/Port Info)

Tag-Based Port Configuration						
Port Number	PVID	Priority	Ingress filter		Double Tag	Isolated
			VIDs non-contained in VLAN table	Ingress port non-member of VLAN		
1	<input type="text" value="1"/>	<input type="text" value="0"/>	Drop	Forward	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="text" value="1"/>	<input type="text" value="0"/>	Drop	Forward	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="text" value="1"/>	<input type="text" value="0"/>	Drop	Forward	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="text" value="1"/>	<input type="text" value="0"/>	Forward	Forward	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="text" value="1"/>	<input type="text" value="0"/>	Drop	Forward	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="text" value="1"/>	<input type="text" value="0"/>	Drop	Forward	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="text" value="1"/>	<input type="text" value="0"/>	Drop	Forward	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="text" value="1"/>	<input type="text" value="0"/>	Drop	Forward	<input type="checkbox"/>	<input type="checkbox"/>
9	<input type="text" value="1"/>	<input type="text" value="0"/>	Drop	Forward	<input type="checkbox"/>	<input type="checkbox"/>
Undo Save						

Figure 76: Tag-Based VLAN Configuration

The menu **Tag-Based Port Configuration** is for configuration of Tag based VLAN. It is enabled only when the VLAN Type is set as **Tag based**. The sub menu **Port Info** let users configure the way in which each port treats the incoming frames that are marked for Tag-based VLANs.

Table 36: Tag-Based VLAN Port Configurations

Parameter	Description				
PVID	Set the VLAN ID. The limit given is between 1 and 4095. The VLAN ID is assigned to all untagged frames received on this port.				
Priority	Set VLAN Priority. The limit given is between 0 ... 7. 0 is the lowest priority and 7 is the highest priority.				
Ingress Filter 1 (Non-Member) and Filter 2 (Untagged)	<p>Non-Member (1): Forward Untagged (2): Forward</p> <ul style="list-style-type: none"> Forward the VLAN-tagged frames which are not members of any VLAN in which the port is participating, and forward all untagged frames. <p>Non-Member (1): Drop Untagged (2): Forward</p> <ul style="list-style-type: none"> Drop the VLAN-tagged frames which are not members of any VLAN of which the port is participating, and forward all untagged frames. <p>Non-Member (1): Drop Untagged (2): Drop</p> <ul style="list-style-type: none"> Drop the VLAN-tagged frames which are not members of any VLAN of which the port is participating, and drop all untagged frames. 				
Isolated	<table border="1"> <tr> <td>Enable</td> <td>The port is isolated. Isolated ports belonging to the same VLAN do not communicate with each other – this is generally set for security reasons. The isolated ports communicate only with the trunk ports, which should NOT be set as isolated.</td> </tr> <tr> <td>Disable</td> <td>The port is not isolated and can communicate with all ports of the VLANs.</td> </tr> </table>	Enable	The port is isolated. Isolated ports belonging to the same VLAN do not communicate with each other – this is generally set for security reasons. The isolated ports communicate only with the trunk ports, which should NOT be set as isolated.	Disable	The port is not isolated and can communicate with all ports of the VLANs.
Enable	The port is isolated. Isolated ports belonging to the same VLAN do not communicate with each other – this is generally set for security reasons. The isolated ports communicate only with the trunk ports, which should NOT be set as isolated.				
Disable	The port is not isolated and can communicate with all ports of the VLANs.				

SS16 – “Tag-based info” menu

Tag-Based VLAN Table	
Vlan ID: <input type="text" value="1"/>	
1	<input type="text" value="Untagging"/>
2	<input type="text" value="Untagging"/>
3	<input type="text" value="Untagging"/>
4	<input type="text" value="Untagging"/>
5	<input type="text" value="Untagging"/>
6	<input type="text" value="Untagging"/>
7	<input type="text" value="Untagging"/>
8	<input type="text" value="Untagging"/>
9	<input type="text" value="Untagging"/>
<input type="button" value="Delete"/>	<input type="button" value="Modify"/>

Add Vlan Configuration	
Vlan ID: <input type="text" value=""/>	(1~4094)
1	<input type="text" value="NO"/>
2	<input type="text" value="NO"/>
3	<input type="text" value="NO"/>
4	<input type="text" value="NO"/>
5	<input type="text" value="NO"/>
6	<input type="text" value="NO"/>
7	<input type="text" value="NO"/>
8	<input type="text" value="NO"/>
9	<input type="text" value="NO"/>
<input type="button" value="Save"/>	

Figure 77: Tag-Based VLAN Table

The sub-menu **Tag-based info** let users add, modify, or delete entries in the Tagging VLAN Table, the configurations of 802.1Q VLANs and the participating ports. Up to 64 VLANs can be configured on the Switch.

On the left is the Tag-based VLAN Table, where existing VLANs can be modified or deleted. In the first row is the VLAN ID (VID) numbers (1, 2, etc.) of the previously configured VLANs. Users can click on a VID number to display the port information of that VLAN.

The following table describes the port parameters in regard to 802.1Q VLANs:

Table 37: Tag-Based Info Menu

Parameter	Description
No	The port is not participating in the VLAN as identified by the selected VID (VLAN ID).
Untagging	The port is an untagging port (as defined in 802.1Q) that is participating in the VLAN. In such an untagged port the Switch will strip off the 802.1Q tag from the incoming and outgoing frames if they are tagged in such a way. This is used for sending frames to non-802.1Q-compliant devices.
Tagging	The port is a tagging port (as defined in 802.1Q) and is participating in the VLAN. The Switch will put the VLAN information of the port – including VID and Priority – into the header of the untagged frames coming in or transmitted from the port. The tagged VLAN information in the frames can later be used by other 802.1Q-compliant devices for forwarding decisions.

Click the button [**Modify**] to modify configurations of the selected VLAN according to the settings on the table.

Click the button [**Delete**] to delete the VLAN entries of the selected VID.

On the left is the **Add Vlan Configuration**” work area where you can add VLAN configuration entries onto the Tagging VLAN Table. Enter a valid configurable

802.1Q VID ranging from 1 ... 4094 into the field on the first row. Next, specify for each port the parameters described in the table above – this will decide if the specific port will participate in that specific VID and how it will participate. Click the button **[Save]** to add the new VLAN to the Tagging VLAN Table.

SS17 - Packet Configuration

Use this screen to set the Jumbo packet limit and the Rate Control for each port of the Switch.

Jumbo Packet / Rate Control Configuration

Jumbo Packet Length : 1536

Rate Control Configuration

Port	Ingress Limit Mode	Ingress-Rate	Egress-Rate(All Frames)
1	Multicast/Broadcast & Flooded unicast	256K	256K
2	Multicast/Broadcast only	512K	Not Limited
3	Broadcast only	1M	Not Limited
4	Multicast/Broadcast & Flooded unicast	8M	Not Limited
5	All Frames	Not Limited	1M
6	All Frames	Not Limited	Not Limited
7	All Frames	Not Limited	Not Limited
8	All Frames	Not Limited	Not Limited
9	All Frames	Not Limited	Not Limited

Undo Save

Figure 78: Jumbo Packet

Click on each parameter field to modify the desired setting, then click on **[Save]** to retain newly entered information or click on **[Undo]** to restore previously saved configurations.

Parameters described below:

Table 38: Jumbo Packet

Parameter	Description
Jumbo Packet Length	Select the size of packets: 1536 – For double-tagged packets or jumbo packets 1522 – For normally tagged packet. 1518 bytes are actually allowed for untagged packets.
Port Ingress Limit Mode	Select to block the specified traffic from the port.
Multicast Rate Limit	<ul style="list-style-type: none"> • All Frames: – Restrict all kinds of packets (Default) exceeding the rate set in the Ingress/Egress Rate fields • Multicast/Broadcast & Flooded unicast: – Restrict these packets when exceeding the set value • Multicast/Broadcast only: – Restrict these packets when exceeding the assigned value • Broadcast only: – Restrict broadcast only packets when exceeding the assigned limit
Ingress / Egress Rate	Set the threshold of traffic of limited packets for each port in the Switch.

SS18 – Port Mirror

Set the port mirroring option to monitor data being transmitted through a specific port.

Figure 79: Port Mirror

Click on each parameter field to modify the desired setting, then click on **[Save]** to retain newly entered information or click on **[Undo]** to restore previously saved configurations.

Table 39: Port Mirror

Parameter	Description
Mirror Mode	Select appropriate mode: - Disable: Mirror mode is disabled. - Ingress & Egress: Monitor both incoming and outgoing traffic. - Egress: Monitor only outgoing traffic.
Monitoring Port	Select the port which will do the monitoring.
Monitored Port	Select the port that needs to be monitored.

SS19 – Trunk Configuration

Port Trunking defines a network link aggregation and trunking method which specifies how to create a single high-speed logical link that combines several low-speed physical links. Use the Trunk Configuration page shown below to create trunk groups. The Switch supports a maximum of four trunk groups. Each trunk group may be comprised of up to four ports, selected from any combination of ports 1 ... 8.

Trunk Configuration	
Trunk Group	Members
1	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input checked="" type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9
2	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input checked="" type="checkbox"/> 6 <input type="checkbox"/> 7 <input checked="" type="checkbox"/> 8 <input type="checkbox"/> 9
3	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input checked="" type="checkbox"/> 9
4	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input checked="" type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9

Undo Save

Figure 80: Trunk Configuration

8.4.7 IGMP Menu – Using the IGMP Menu

The IGMP menu is used for configuring IGMP snooping. IGMP means "Internet Group Management Protocol". It is a protocol through which hosts can register with their local router for multicast services. If there is more than one multicast router on a given sub-network, one of the routers is elected and assumes the responsibility of keeping track of group membership.

SS20 – IGMP Configuration

This menu allows the user to Enable/Disable IGMP Snooping and IGMP Query.



Note

Please note

In order to keep the switch traffic efficient, the last byte of the IP address should not be the same as in the IGMP group. E.g. if the Switch's IP address is 192.168.0.10 and the IGMP router/switch's IP address is 192.168.21.10, this will make the switch less efficient.

Figure 81: IGMP Configuration

SS21 – IGMP Group Status

This window will display the IGMP group status of the port members if IGMP traffic is present.

IGMP Groups Status											
No.	Multicast Group	VID	1	2	3	4	5	6	7	8	9
001	235.080.068.083	----	-	-	Q	M	Q	-	-	Q	-
002	239.083.100.109	----	-	-	Q	M	Q	-	-	Q	-

Figure 82: IGMP Group Status

8.4.8 The MAC Menu

The MAC menu will enable the following configurations:

SS22 – MAC Table Status

The user can view the MAC Table by selecting this function.

MAC Table Status												
No.	MAC Address	Static	Priority	1	2	3	4	5	6	7	8	9
0001	00-30-DE-00-62-84	No	00	-	-	-	-	X	-	-	-	-
0002	00-30-DE-FF-9E-61	Yes	00	-	-	-	-	-	-	-	-	-
0003	01-80-C2-00-00-00	No	03	-	-	-	-	-	-	-	X	-
0004	01-80-C2-FF-FF-F1	Yes	03	-	-	-	-	-	-	-	X	-

Figure 83: MAC Table Status

SS23 – Lock Learning MAC

The user can stop specific port(s) from learning MAC addresses. Select the port(s) that need to be locked so that they cannot learn MAC addresses.

Lock MAC Address Learning	
Port	Lock
Port 1	<input checked="" type="checkbox"/>
Port 2	<input type="checkbox"/>
Port 3	<input type="checkbox"/>
Port 4	<input type="checkbox"/>
Port 5	<input type="checkbox"/>
Port 6	<input type="checkbox"/>
Port 7	<input type="checkbox"/>
Port 8	<input type="checkbox"/>
Port 9	<input type="checkbox"/>
<input type="button" value="Undo"/> <input type="button" value="Save"/>	

Figure 84: Lock Learning MAC

SS24 – Static MAC Configuration

Here the user can select a static MAC configuration for certain port(s) of the Industrial Managed Switch.

Add the valid **MAC address** in the MAC field, then select the priority and port number. Press [**Save**] to implement the input.

The Static MAC addresses and their settings will be displayed in the table below the input bar. Press [**Delete**] to void the configuration.

The screenshot displays the 'Static Unicast MAC Configuration' web page. At the top, there is a title bar. Below it, the configuration fields are arranged as follows:

- MAC Address :** A text input field with the example value '00.01.02.03.04.05' shown to its right.
- Priority :** A dropdown menu currently showing '0', with '(0~3)' indicated to its right.
- Port :** A dropdown menu currently showing '1', with '(1-9)' indicated to its right.

Below these fields is a 'Save' button. Underneath the 'Save' button is a large, empty light-green rectangular area. At the bottom of the page, there is a table header with the following columns: 'No.', 'MAC-Address', 'Priority', 'Port', and 'Delete'.

Figure 85: Static MAC Configuration

SS25 – MAC Limit Configuration:

Mac Limit Configuration		
Mac Limit Function:	<input type="text" value="Enable"/>	Limit Quantity: 1~20 (MAX)
Port	Limit Quantity	Action
PORT1	<input type="text" value="5"/>	<input type="text" value="Disable"/>
PORT2	<input type="text" value="5"/>	<input type="text" value="Disable"/>
PORT3	<input type="text" value="5"/>	<input type="text" value="Disable"/>
PORT4	<input type="text" value="20"/>	<input type="text" value="Enable"/>
PORT5	<input type="text" value="5"/>	<input type="text" value="Disable"/>
PORT6	<input type="text" value="5"/>	<input type="text" value="Disable"/>
PORT7	<input type="text" value="5"/>	<input type="text" value="Disable"/>
PORT8	<input type="text" value="5"/>	<input type="text" value="Disable"/>
PORT9	<input type="text" value="5"/>	<input type="text" value="Disable"/>

Undo

Figure 86: MAC Limit Configuration

The menu **MAC Limit Configuration** let the user limit the number of incoming MAC addresses per port. If the user wants to disable this function, select **[Disable]** from the combo box Mac Limit Function on the upper left. The **Limit Quantity** range is 1 ... 20 per port. The MAC addresses learned are recorded on a per-port basis. Only the frames with such recorded MAC addresses will be forwarded. This learning process will be conducted every 3 minutes. So, if users change the NIC of the PC or IP appliance, the new MAC address will be learned in 3 minutes by the Switch, with the set quantity limitations. The **MAC Limit Function** can be disabled or enabled per port, under the parameter labeled **Action** in the table. Generally this function is only enabled for downlink ports.

8.4.9 QoS Menu

QoS (Quality of Service) refers to the mechanisms in the Switch's network software that make the actual determinations of which packets have priority. The Switch supports advanced QoS features like scheduling, classification and policing.

SS26 – QoS Base Configuration

This window offers user to perform the basic configuration for Quality of Service. Schedule Mode: **weighted fair queuing/all high before low**

QoS Base Configuration		
Schedule Mode : weighted fair queuing		
Tag Priority Enable	IP ToS Priority Enable	IP Over Tag
Port 1 -	Port 1 -	Port 1 V
Port 2 -	Port 2 -	Port 2 V
Port 3 -	Port 3 -	Port 3 V
Port 4 -	Port 4 -	Port 4 V
Port 5 -	Port 5 -	Port 5 V
Port 6 -	Port 6 -	Port 6 V
Port 7 -	Port 7 -	Port 7 V
Port 8 -	Port 8 -	Port 8 V
Port 9 -	Port 9 -	Port 9 V

Undo Save

Figure 87: QoS Base Configuration

Weighted Fair Queuing (WFQ) is a packet scheduling technique allowing guaranteed bandwidth services. The purpose of WFQ is to let several sessions share the same link.

Once you adjusted the basic settings, use the button [**Save**] to implement these changes.

SS27 – Tag Priority

The user can define up to eight different priority values for the Tagged VLAN frames. Select the priority queue number for the Switch to map the MAC frames into different priority queues: i.e. **High**, **Medium**, **Normal** or **Low**. Use **[Save]** to apply the settings.

Tag Priority Table	
Number	Priority
0	Preferred
1	High
2	Normal
3	Low
4	Preferred
5	Low
6	Low
7	Low
<input type="button" value="Undo"/> <input type="button" value="Save"/>	

Figure 88: Tag Priority Table

SS28 – IP ToS Priority

The IP ToS (Type of Service) Priority menu provides up to 63 different priorities. The user can select the most suitable combination.

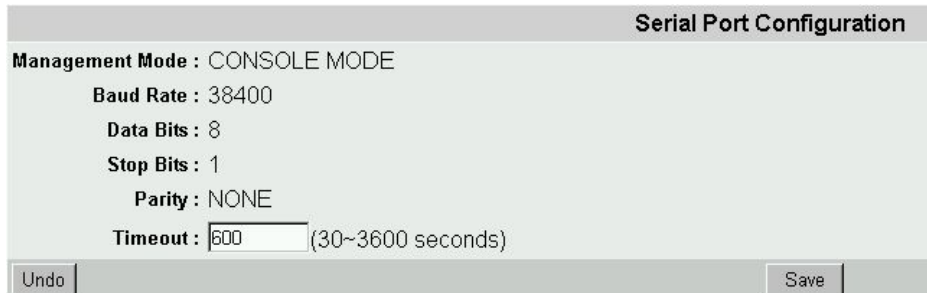
IP ToS Priority Table																
Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Priority	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Number	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Priority	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Number	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Priority	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Number	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Priority	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
<input type="button" value="Undo"/> <input type="button" value="Save"/>																

Figure 89: IP ToS Priority Table

8.4.10 Management Configurations

SS29 – Serial Port Configuration

Here the user can see the serial port configuration that can be utilized while accessing the switch via Console port.



Serial Port Configuration

Management Mode : CONSOLE MODE

Baud Rate : 38400

Data Bits : 8

Stop Bits : 1

Parity : NONE

Timeout : (30~3600 seconds)

Figure 90: Serial Port Configuration

Click on each parameter field to modify the desired setting, then click on **[Save]** to retain newly entered information or click on **[Undo]** to restore previously saved configurations.

Table 40: Serial Port Configuration

Parameter	Description
Management Mode Baud Rate Data Bits Stop Bits Parity	Default COM port properties
Time Out	Set the time (seconds) for auto-logout in case there is no activity for that time period

8.4.11 SNMP Configurations

SS30 - SNMP Communities

SNMP Communities	
GET	Community Name public
SET	Community Name private
Undo	Save

Figure 91: SNMP Configuration

Click on each parameter field to modify the desired setting, then click on **[Save]** to retain newly entered information or click on **[Undo]** to restore previously saved configurations.

Table 41: SNMP Configuration

Parameter	Description
GET	Community Name public - for reference only.
SET	Community Name private - a group that can be renamed, e.g. individuals that have access to this management program.
Community Names	Modify the Community names.



Note

Please note

You can use an external SNMP-based application to configure and manage the switch. This management method requires the SNMP agent on the switch and the SNMP Network Management Station to use the same community string. This management method, in fact, uses two community strings: the GET community string and the SET community string. If the SNMP Network Management Station only knows the SET community string, it can read and write to the MIBs (Management Information Bases of the devices), but, if it only knows the GET community string, it can only read the MIBs.

The default GET and SET community strings for the switch is **public**.

SS31 - IP Trap Manager

The following tables describe how to specify the management stations that will receive authentication failure messages or other trap messages from the switch. Up to 5 trap managers may be assigned.

IP Trap Manager		
IP Address	Community Name	Status
192.168.0.200	public	Enabled
0.0.0.0	public	Disable
0.0.0.0	public	Disable
0.0.0.0	public	Disable
0.0.0.0	public	Disable

Figure 92: IP Trap Manager

Click on each parameter field to modify the desired setting, then click on **[Save]** to retain newly entered information or click on **[Undo]** to restore previously saved configurations.

Table 42: IP Trap Manager

Parameter	Description
IP Address	Enter the IP address of terminals for when abnormalities on a connection occur and an alarm needs to be sent. The alarm will be sent to these terminals. Enter their community names and disable or enable their alarm function accordingly.
Community Name	Enter their community names.
Status	Disable or enable their alarm functions.

SS32 – E-mail Alarm Configuration

The Industrial Managed Switch can send alarm notifications via e-mail to assigned e-mail addresses in case of any abnormal event. Up to 5 e mail addresses can be assigned.

Figure 93: eMail Alarm Configuration

Click on each parameter field to modify the desired setting, then click on **[Save]** to retain newly entered information or click on **[Undo]** to restore previously saved configurations.

Table 43: eMail Alarm Configuration

Parameter	Description
Email Alarm	Enable/Disable e-mail alarm notification (Default = Disable).
Mail Server IP	Enter the IP address of the mail server.
From	Valid e-mail address assigned to the Switch.
To	E-mail address(es) to which e-mail will be sent (maximum of 5).
Alarm Type	Enable/Disable the type of event that should trigger an e-mail alarm

SS33 – User Configuration

If this is your first time to log into the configuration program, then the default user name is **admin** with no password. The **user level** access allows configuration to all parameters and statistics.

You should define a new administrator password, record it and put it in a safe place. Select **User Configuration** from the **Management Setup Menu** and enter a **user name** and/or **password** for the administrator. Note that passwords can consist of up to 12 and the username up to 20 alphanumeric characters – and they are not case sensitive.

Figure 94: User Configuration

Five users can be configured by the Switch.

Click on each parameter field to modify the desired setting, then click on **[Save]** to retain newly entered information or click on **[Undo]** to restore previously saved configurations.

Table 44: User Configuration

Parameter	Description
User Name	Modify the default Username.
Password	Modify the User Password.
User Level	<p>- Read/Write Users with the user level Read/Write have administrator privileges and can look at AND change the configurations of the Switch.</p> <p>- Read Only The users with the user level Read Only can only look at the configurations of the Switch.</p>

SS34 – Cable Test

Cable Test is used to diagnose the physical copper links connected each port, by separate pairs in a cable. Before the Cable Test is activated, a confirmation message **Cable Test will disable normal network functions for one minute. Do you want to continue?** will pop up for user's confirmation. If the link is well-connected, the Status column will show "normal". If the link is disconnected, the Status column will show "open", and the Cable Length column will display the estimated distance from the port to the location where the circuit is open.

Cable Test							
Port	PHY	Test	Status	CableLength	Test	Status	CableLength
1	100	pass(Rx)	normal		pass(Tx)	normal	
2	100	pass(Fx)	open	about 0M	pass(Tx)	open	about 0M
3	100	pass(Fx)	open	about 0M	pass(Tx)	open	about 0M
4	100	pass(Rx)	normal		pass(Tx)	mismatch	about 2M
5	100	pass(Rx)	open	about 0M	pass(Tx)	open	about 0M
6	100	pass(Rx)	open	about 0M	pass(Tx)	open	about 0M
7	100	pass(Fx)	open	about 0M	pass(Tx)	open	about 0M

Figure 95: Cable Test

SS35 - Firmware Download (Upgrade System)

Use the HTTP Download menu to load software updates into the permanent flash ROM in the switch. The download file should be in a binary format. Otherwise, the agent will not accept it. The success of the download operation depends on the quality of the network connection. After downloading the new software, the agent will automatically restart itself. See the following figure and table:

Upgrade System	
File Name :	<input type="text"/> <input type="button" value="Durchsuchen..."/>
<input type="button" value="Start Upgrade"/>	

Figure 96: Upgrade System

Click on [**Durchsuchen**] to select the firmware file. Once the selection is made, click [**Start Upgrade**] to upgrade the systems. The Switch will restart once the new firmware is uploaded.

Table 45: Upgrade System

Parameter	Description
File Name	Use the Browse function to find and select the firmware to be uploaded.
Start Upgrade	Click here to upgrade firmware.

SS36 – Configuration File (System Backup)

The Industrial Managed Switch enables the user to get a back up of the configuration file. This will help the user to install many switches with the same configurations.



Figure 97: System Backup

Backup settings:

Click the button [**Backup Setting**] and a download window for **Config.bin** will appear. Save the file in a safe location for later retrieval.

Restore settings:

Click on button [**Durchsuchen**] to select the downloaded/backed up configuration file, and then press the button [**Restore Setting**]. The Industrial Managed Switch will restart and apply the settings as in the configuration file.

Table 46: Configuration File

Parameter	Description
System Backup	Use this menu to make a backup of the Switch's configurations. To begin, click on the backup setting button. Then follow the prompts to save the Switch's configurations to a designated terminal.
Restore Settings	Use this menu to retrieve saved files. Click the browse function to select the correct file. Then click Restore Settings .

SS37 – Restart Option

Figure 98: Restart Option

Click one of these buttons to reset/restart the system without turning OFF the power.

**Note****Please note**

If you press either [**Restore**] or [**Reset**], the reset will commence immediately!

**Note****Please note**

If you click on the [**Restore**] button will set the switch back to the factory defaults immediately, all saved configurations will be lost!

Table 47: Restart Option

Parameter	Description
System Restore Factory Default Settings	Clicking on the [Restore] button will set the switch back to factory defaults.
System Reset	Click on the [Reset] button to reboot the switch. After rebooting, it is necessary to log in again.

8.5 D – Command Line Interface via Telnet/Console port

This section provides some basic instructions for using CLI to configure the Switch. Follow the instructions below:

- 1 Open a Command Prompt window and type

telnet xxx.xxx.xxx.xxx where the xxx's represent the IP address.

As an example, we'll first use the IP address configured in part A of this manual: 192.168.0.190. The later screenshots are of a different IP address.

- 2 Then "Press [ENTER] key to start"

SS1 – Log in

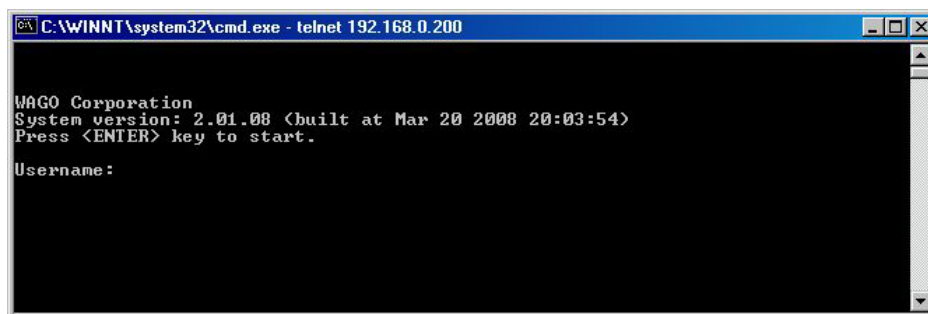


Figure 99: Log-in

- 3 The default log-in name is **admin** with no preset password. The system provides both CLI and menu driven user interfaces via console or telnet. After you log into the system, you will see a welcome message as below:

SS2 – Welcome



Figure 100: Welcome screen

4 Type **1** to select CLI operations

At this point, type in **?** or **help** followed by **[Enter]** to display a full list of help commands with explanations of their functions.

SS3 – Help commands

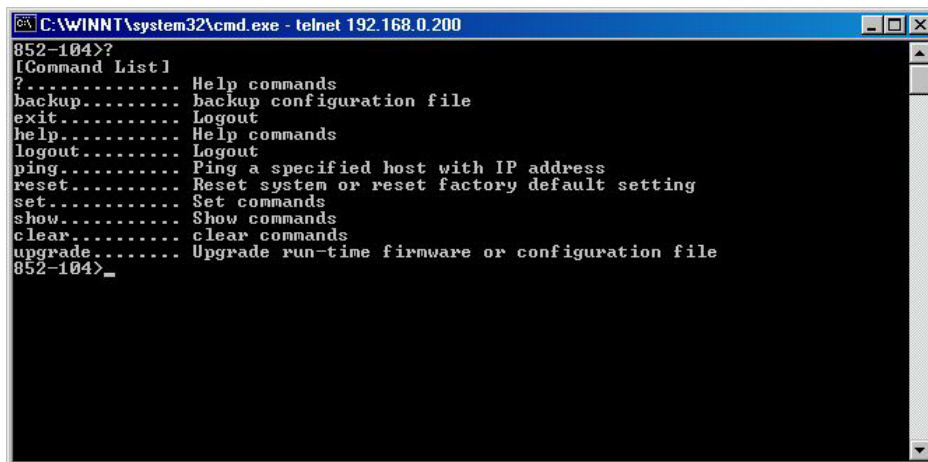
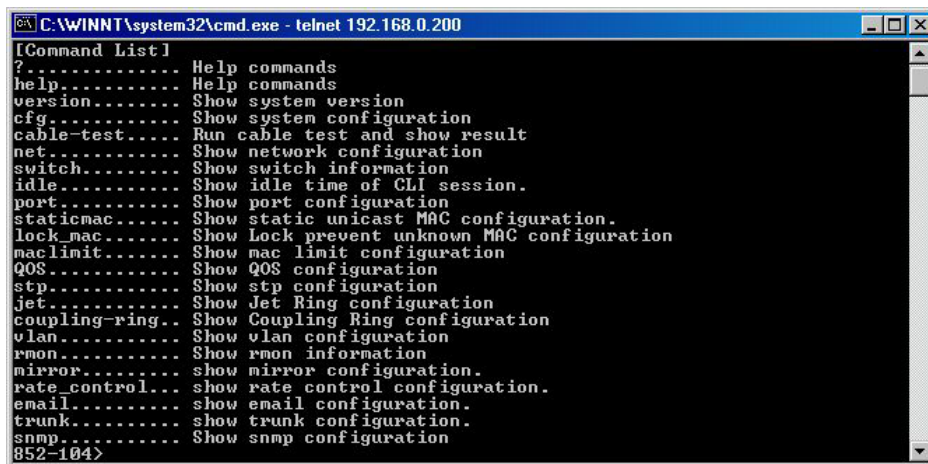


Figure 101: Help commands

The table above lists and explains all the configuration commands. Users can refer to the table when configuring the Switch management agent. Where appropriate, a status report can be shown by typing **show** followed by the parameter name.

Type **show** and press **[Enter]** to display a full list of configuration commands.

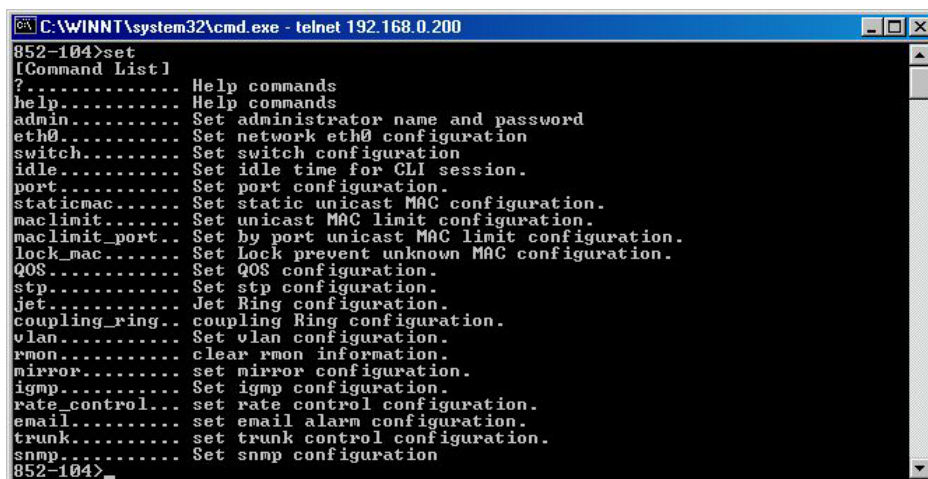
SS4 - Show commands



```
C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
[Command List]
?..... Help commands
help..... Help commands
version..... Show system version
cfg..... Show system configuration
cable-test.... Run cable test and show result
net..... Show network configuration
switch..... Show switch information
idle..... Show idle time of CLI session.
port..... Show port configuration
staticmac..... Show static unicast MAC configuration.
lock_mac..... Show Lock prevent unknown MAC configuration
maclimit..... Show mac limit configuration
QOS..... Show QOS configuration
stp..... Show stp configuration
jet..... Show Jet Ring configuration
coupling-ring.. Show Coupling Ring configuration
vlan..... Show vlan configuration
rmon..... Show rmon information
mirror..... show mirror configuration.
rate_control... show rate control configuration.
email..... show email configuration.
trunk..... show trunk configuration.
snmp..... Show snmp configuration
852-104>
```

Figure 102: Show commands

SS5- System configurations



```
C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
852-104>set
[Command List]
?..... Help commands
help..... Help commands
admin..... Set administrator name and password
eth0..... Set network eth0 configuration
switch..... Set switch configuration
idle..... Set idle time for CLI session.
port..... Set port configuration.
staticmac..... Set static unicast MAC configuration.
maclimit..... Set unicast MAC limit configuration.
maclimit_port.. Set by port unicast MAC limit configuration.
lock_mac..... Set Lock prevent unknown MAC configuration.
QOS..... Set QOS configuration.
stp..... Set stp configuration.
jet..... Set Jet Ring configuration.
coupling_ring.. coupling Ring configuration.
vlan..... Set vlan configuration.
rmon..... clear rmon information.
mirror..... set mirror configuration.
igmp..... Set igmp configuration.
rate_control... set rate control configuration.
email..... set email alarm configuration.
trunk..... set trunk control configuration.
snmp..... Set snmp configuration
852-104>
```

Figure 103: System Configuration

Enter the command line and follow the argument list. Be sure to put a space between the commands. E.g. changing or setting the company name:

- set eth0 ip xxx.xxx.xxx.xxx

A confirmation note will follow

SS6 – Confirmation Note

```
852-104>set eth0 ip 192.168.0.200
Set IP address successful!
852-104>
```

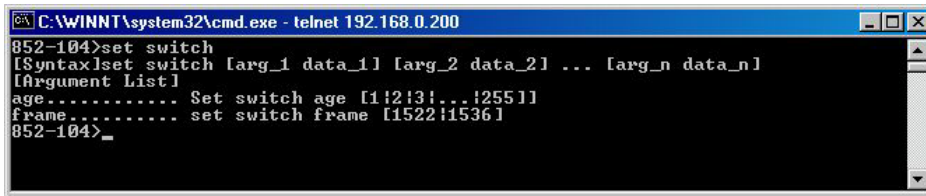
Figure 104: Confirmation note

By using a similar command line, all the other available system parameters – such as port configuration, SNMP, rate, idle time, etc. can be modified to your own network requirements.

Table 48: Confirmation note

Parameter	Description
set	<ul style="list-style-type: none"> • set admin – follow the prompts to change username and password • set eth0 – configure ip (new IP address) network mask (new network mask) gateway (new gateway). Use this command to set new addresses. • set switch – set switch parameters like jumbo frame, max age, and counter • set idle (time in seconds) – set automatic logout when the program is idle. • set port name – use this command to assign a name to each port • admin – enable/disable • speed – set the speed for each port • duplex – set the duplex mode for each port • autonego – enable/disable auto-negotiation • loopback – enable/disable loopback • mcrate – assign a limit for multicast rate • egress – Switch treatment of RX packets • ingress – port treatment of TX packets • priority – set the priority for each port • ffc – enable/disable Activate Flow control • vid – assign VLAN IDs • set rmon – clear rmon display • set mirror – configure the mirroring port • set snmp – configure snmp and communities

SS7 - Switch configurations



```
C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
852-104>set switch
[Syntax]set switch [arg_1 data_1] [arg_2 data_2] ... [arg_n data_n]
[Argument List]
age..... Set switch age [1|2|3|...|255]
frame..... set switch frame [1522|1536]
852-104>_
```

Figure 105: Switch Configuration

Enter the command line and follow the argument list. Be sure to put a space between the commands. E.g. setting the switch age:

- set switch age 1

A confirmation note will follow.

Note

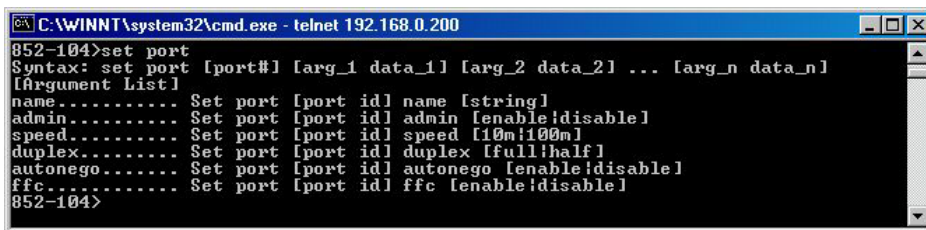


Please note

Each switch age unit is equal to 16 seconds. The default is 304 seconds. The limit given is from 1 ... 255 units. This is the time-out period in seconds for aging out dynamically learned forwarding information.

By using a similar command line, the other Switch parameters – like frame and counter – can be modified to your own requirements.

SS8 - Port configurations



```
C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
852-104>set port
Syntax: set port [port#] [arg_1 data_1] [arg_2 data_2] ... [arg_n data_n]
[Argument List]
name..... Set port [port id] name [string]
admin..... Set port [port id] admin [enable|disable]
speed..... Set port [port id] speed [10m|100m]
duplex..... Set port [port id] duplex [full|half]
autonego..... Set port [port id] autonego [enable|disable]
ffc..... Set port [port id] ffc [enable|disable]
852-104>
```

Figure 106: Port Configuration

Enter the command line and follow the argument list. Be sure to put a space between the commands. E.g. changing or setting the name of port 1:

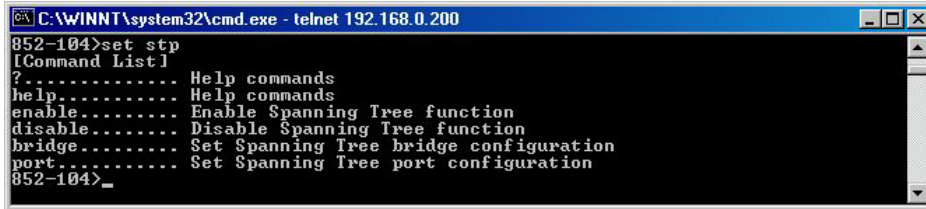
- set port 1 name office

A confirmation notice will follow

By using a similar command line, all the other port parameters such as admin, speed, duplex, autonego, mcrate, etc. can be modified to your requirements.

SS9 & SS10 - Spanning Tree Protocol (STP) configurations

STP allows the Switch to assign a priority status on the Switch with respect to other networking nodes in the network. Ensure that this function is activated when setting up backup links and to avoid collisions.



```
C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
852-104>set stp
[Command List]
?..... Help commands
help..... Help commands
enable..... Enable Spanning Tree function
disable..... Disable Spanning Tree function
bridge..... Set Spanning Tree bridge configuration
port..... Set Spanning Tree port configuration
852-104>
```

Figure 107: STP Configuration

Enter the command line and follow the argument list. Be sure to put a space between the commands. E.g. changing or setting the STP status:

- set stp enable



```
C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
852-104>set stp enable
Enable Spanning Tree ... ..
Enable Spanning Tree function successful!
852-104>
```


Figure 108: Spanning Tree

By using a similar command line, all other STP parameters – such as bridge and port can be modified to your own requirements.

SS11 - Virtual LAN configurations

Enter the command line and follow the argument list. Be sure to put a space between the commands. E.g. changing or setting VLANs:

- show vlan



```
C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
852-104>show vlan
Syntax      : [arg_1 data_1] [arg_2 data_2]
[Argument List]
type..... Show vlan type
port_based..... Show vlan port_based
tag_based..... Show vlan tag_based [port_info/vlan_id/vlan_table]
852-104>
```

Figure 109: VLAN Configuration

Enter the command line and follow the argument list. Be sure to put a space between the commands. E.g. changing or setting the VLANs:

- set vlan



```
C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
852-104>set vlan
Syntax      : [arg_1 data_1] [arg_2 data_2]
[Argument List]
type..... Set vlan type [Disable/Port_based/Tag_based]
port_based..... Set vlan port_based [Port number] member [1 2 3...9]
tag_based..... Set vlan tag_based [port_info/add_vlan/delete_vlan]
852-104>
```

Figure 110: VLAN Configuration Example

Above example given to configure VLANs

Use a similar command line as above to configure VLAN parameters such as members, VID, priority, Ingress mode and Egress mode to your own requirements.

8.5.1 Simple Net Management Protocol (SNMP) configurations using CLI

SS12 - SNMP configurations



```
Auswählen C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
852-104>set snmp
[Syntax]set snmp [arg_1 data_1] [arg_2 data_2] ... [arg_n data_n]
[Argument List]
name..... Set system name
location..... Set system location
contact..... Set system contact name
getcommunity... Set GET community
setcommunity... Set SET community
trapcommunity.. Set TRAP community
trapip..... Set TRAP IP address
trapenable.... Set TRAP enable
852-104>_
```

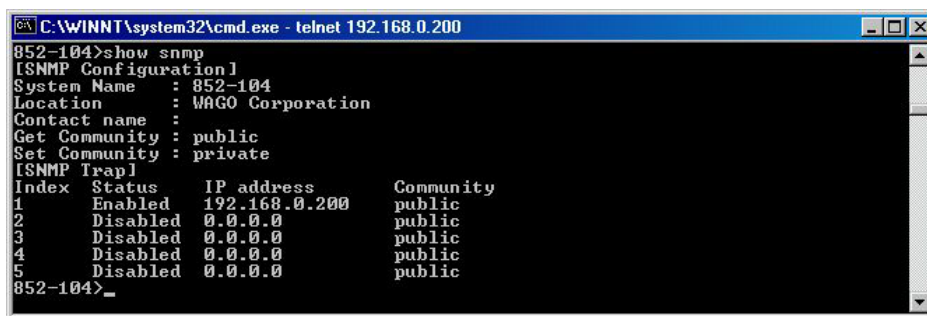
Figure 111: SNMP Configuration

Enter the command line and follow the argument list. Be sure to put a space between the commands. E.g. changing or setting SNMP functions:

- set snmp contact service@MyCompany.Com

A message will follow to confirm new settings.

SS13 - Set Trap



```
C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
852-104>show snmp
[SNMP Configuration]
System Name      : 852-104
Location        : WAGO Corporation
Contact name     :
Get Community    : public
Set Community    : private
[SNMP Trap]
Index  Status   IP address   Community
1      Enabled  192.168.0.200 public
2      Disabled 0.0.0.0     public
3      Disabled 0.0.0.0     public
4      Disabled 0.0.0.0     public
5      Disabled 0.0.0.0     public
852-104>_
```

Figure 112: Set Trap

There are five addresses that an alarm can be sent to when abnormalities occur on a connection. To set up this list, use the following example to configure your own list. Type the following command line and press <Enter>:

- set snmp trapip 1 xxx.xxx.xxx.xxx
- set snmp trapcommunity 1 Bob

Use a similar command line to configure traps 2 - 5

Type show snmp to view the list – e.g:

Note



Please note

Use Web Browser Interface to enable each trap community.

SS14 - Set e-mail



```
C:\WINNT\system32\cmd.exe - telnet 192.168.0.200
852-104>set email
Syntax: set email [arg_1 ] [arg_2 ] [arg3 ] [arg4 ]
[Argument List]
server..... Set email server [IPstring]
alarm..... Set email alarm [enable|disable]
from..... Set email from [string]
to..... Set email to [id] [string] [enable|disable]
type..... Set email type {coldstart|warmstart|rj45up|rj45down|fiberup|fiberdown|confchange|newrootid|topchangeid|newmaster|ring|expressring|failed|couplingring|failed} [enable|disable]
852-104>
```

Figure 113: Set e-mail

There are five e-mail addresses that an alarm can be sent to when abnormalities occur on a connection. To set up the e-mail list and other parameters, use the following example. Type the following command line and press **[ENTER]**:

- set e-mail to 1 admin@MyCompany.com
- set e-mail from 852-104@MyCompany.com



Note

Please note


Use Web Browser Interface to enable e-mail alarm.

9 Technical Data

Table 49: Technical Data

Technical Data	
Ports	7 x 10/100Base-TX (RJ-45); 2 x SFP 100Base-FX Fiber; 1 x RS-232 (RJ-45), optional
Standards	IEEE 802.3u 100Base-TX/FX; IEEE 802.3ad Port Trunking; IEEE 802.3 10Base-T; IEEE 802.1d Spanning Tree Protocol; IEEE 802.3x Flow Control; IEEE 802.1p Priority Queues; IEEE 802.1q VLAN Tagging
MAC table	Up to 2 K addresses
VLANs	Port-based and Tag-based (64 VIDs)
Throughputs	14,880/148,800 packets per second (pps) to 10/100 Mbps ports
Wavelength (optical fibers)	depend on SFP module
Maximum distances	10/100Base-TX: 100 m; Fiber optic: up to 30 km; RS-232: 15 m
Supply voltage	DC 9 V ... 48 V
Power consumption max.	10,08 W
Power consumption typ. (24 V)	8,4 W
Operating temperature	852-104 0 °C ... +60 °C 852-104/040-000 -40 °C ... +70 °C
Storage temperature	852-104 -20 °C ... +80 °C 852-104/040-000 -40 °C ... +85 °C
Relative air humidity (no condensation)	95 %
Dimensions (mm) W x H x L	50 x 120 x 162 Height from upper edge of DIN 35 rail
Weight	approx. 1050 g
Vibration resistance	acc. to IEC60068-2-6
Shock resistance	acc. to IEC60068-2-27
Degree of protection	IP 30
EMC-Immunity to Interference	acc. to EN 61000-6-2 (2005)
EMC-Emission of Interference	acc. to EN 61000-6-4 (2007)

9.1 Approvals

 Conformity Marking

 cUL_{US} (UL508)

10 Troubleshooting

The network administrator can observe and monitor the statuses of most of the Switch's functions by looking at the LED indicators on the front panel. This section contains a few of the more common problems that may arise – and possible solutions.

Table 50: Troubleshooting

Symptom	Cause	Solution
Power indicator does not light up after power on	Defective power outlet or power cord	Verify if the power outlet is functioning normally by plugging in another properly operating device. Connect the power cord to another device to test. If these two tests fail to find the problem, replace the power supply unit
Link indicator does not light up after making a connection	Network cable or fiber/copper port is defective	Ensure that the Industrial Managed Switch and the attached device are powered on. Verify that the fiber and/or copper cable has been properly connected to both devices. Check that the cabling distance does not exceed specified limits for the cable type. Inspect cable for defects and replace if necessary
Unit powers off during operation after a period of time	Loose power connections, power surges / loss or unavailability of redundant power	Ensure that all power connections are secure and that the redundant power is properly attached. If unable to correct the problem by above measures, it may be necessary to replace the internal power-supply unit

11 Appendix

11.1 Appendix A

11.1.1 Console Cable (RJ-45 to DB9)

When connecting your Switch’s console port to your COM port, use the provided console cable. The pin assignments are as follows.

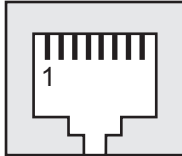


Figure 114: RJ-45 pin assignment

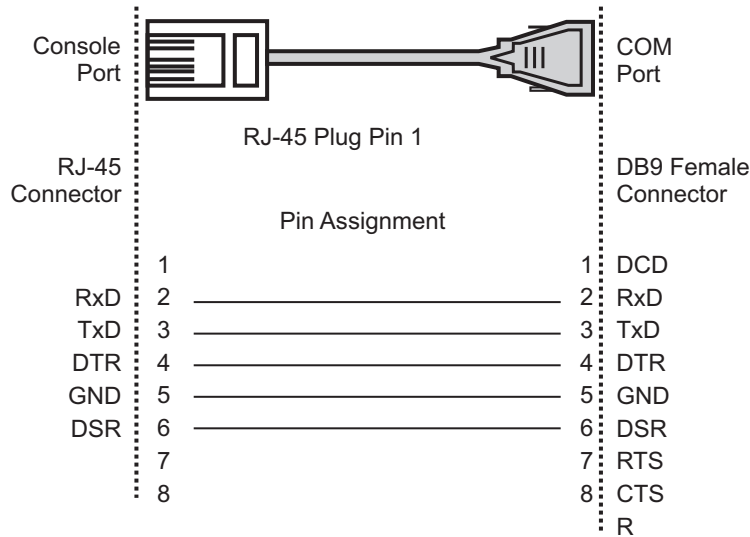


Figure 115: RJ-45 to DB9 pin assignment

11.2 Appendix B

11.2.1 Application Diagram

The Switch was specially developed with a redundant link feature. This is particularly suited for Industrial applications that demand the utmost in reliability. The device comes with 7 copper and 2 fiber ports. With this design, a primary and a redundant link can be configured to ensure an "always on" connection exists, eliminating costly network downtime.

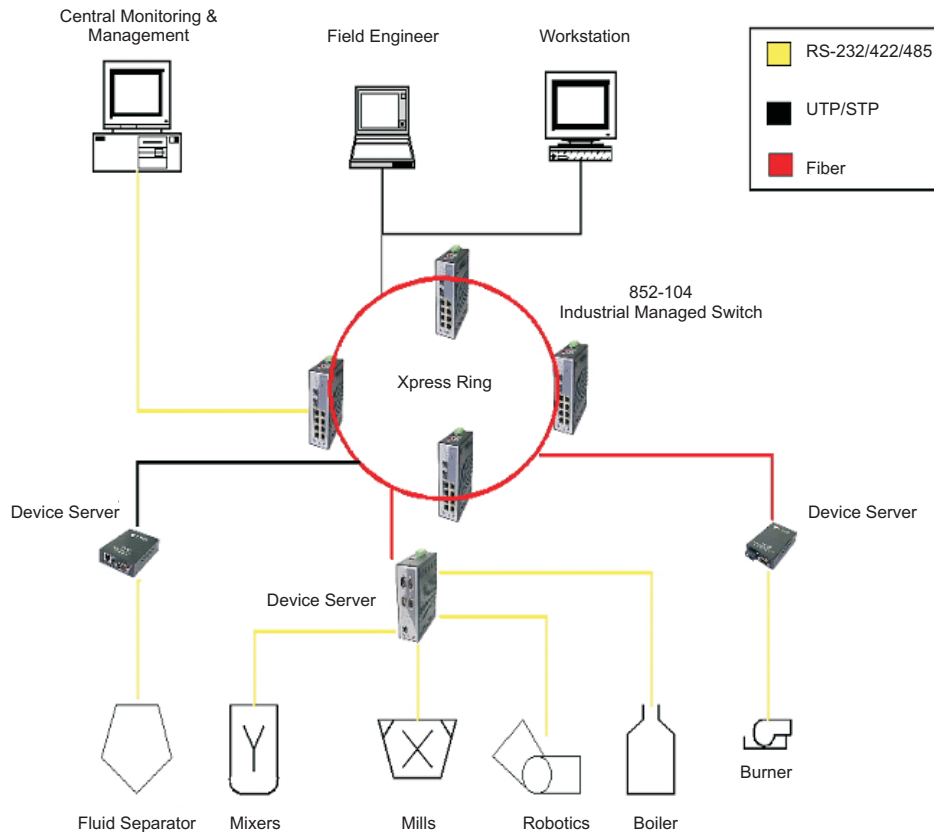


Figure 116: Application Diagram

11.3 Appendix C

11.3.1 SNMP Trap List

- 1 Switch Traps Group (private)
- 2 Cold start
- 3 Warm start
- 4 Link up
- 5 Link down
- 6 System configuration change
- 7 MIB-II Traps
- 8 Cold start
- 9 Warm start
- 10 Link up
- 11 Link down
- 12 Authentication failure

11.4 Appendix D

11.4.1 Default Settings

The following tables contain the default settings that will be restored when the **System Restore Factory Default Settings** function is activated.

Table 53: System Default Settings

System Restore Factory Default Settings	
Description	Managed 7-Port + 2-slot Fiber Industrial Switch
Serial number	OOOOOOOOO1
Model Name	7+2+1-port Switch
Company Name	
Board Name	6700-00747-0100
Manufacture Time	0:0:0 0/0/0
System Name	7+2+1-port Switch
Location	
Contact Name	
Username	admin
Password	
ip address	192.168.0.254
Netmask	255.255.255.0
Gateway	192.168.0.1

Table 54: Port Settings

Port Setting							
	Type	Admin	Speed	Duplex	Link	Auto	FlowCtl
Port 1	RJ45	enable	100M	full	up	on	Disable
Port 2	RJ45	enable	100M	full	up	on	Disable
Port 3	RJ45	enable	100M	full	up	on	Disable
Port 4	RJ45	enable	100M	full	up	on	Disable
Port 5	RJ45	enable	100M	full	up	on	Disable
Port 6	RJ45	enable	100M	full	up	on	Disable
Port 7	RJ45	enable	100M	full	up	on	Disable
Port 8	Fiber	enable	100M	full	up	on	Disable
Port 9	Fiber	enable	100M	full	up	on	Disable
RX/TX Counter Mode			Good Mode				

Table 55: Bridge Configuration

Bridge Configurations	
Spanning Tree	Disabled
Bridge Priority	32768
Hello Time	2
Forward delay	15
Max age	20
Age time	19

Table 56: Spanning Tree Port Configuration

Spanning Tree Port Configuration			
Port	Type	Priority	Cost
1	RJ-45	128	19
2	RJ-45	128	19
3	RJ-45	128	19
4	RJ-45	128	19
5	RJ-45	128	19
6	RJ-45	128	19
7	RJ-45	128	19
8	Fiber	128	19
9	Fiber	128	19

Table 57: Port-Based VLAN Configuration

Port- Based VLAN Configuration									
Members									
PortID	1	2	3	4	5	6	7	8	9
1	-	Y	Y	Y	Y	Y	Y	Y	Y
2	Y	-	Y	Y	Y	Y	Y	Y	Y
3	Y	Y	-	Y	Y	Y	Y	Y	Y
4	Y	Y	Y	-	Y	Y	Y	Y	Y
5	Y	Y	Y	Y	-	Y	Y	Y	Y
6	Y	Y	Y	Y	Y	-	Y	Y	Y
7	Y	Y	Y	Y	Y	Y	-	Y	Y
8	Y	Y	Y	Y	Y	Y	Y	-	Y
9	Y	Y	Y	Y	Y	Y	Y	Y	-

Table 58: Tag-Based VLAN Configuration

Tag-Based VLAN Configuration				
VLAN 1: Port 1 ~ 8: Untag				
PortID	VID	Priority	Ingress_filter	Isolated
1	1	0	NonMember: Drop Untagged: Forward	Disabled
2	1	0	NonMember: Drop Untagged: Forward	Disabled
3	1	0	NonMember: Drop Untagged: Forward	Disabled
4	1	0	NonMember: Drop Untagged: Forward	Disabled
5	1	0	NonMember: Drop Untagged: Forward	Disabled
6	1	0	NonMember: Drop Untagged: Forward	Disabled
7	1	0	NonMember: Drop Untagged: Forward	Disabled
8	1	0	NonMember: Drop Untagged: Forward	Disabled
9	1	0	NonMember: Drop Untagged: Forward	Disabled

Table 59: Jumbo Packet / Multicast Rate Configuration

Jumbo Packet/ Multicast Rate Configuration	
Jumbo Packet Length: 1536 [1522 1536] Bytes	
Port	Multicast Rate Limit
1	100 [3 6 12 100] %
2	100 [3 6 12 100] %
3	100 [3 6 12 100] %
4	100 [3 6 12 100] %
5	100 [3 6 12 100] %
6	100 [3 6 12 100] %
7	100 [3 6 12 100] %
8	100 [3 6 12 100] %
9	100 [3 6 12 100] %

Table 60: BackUp Configuration Variables

Back-up Configuration Variables	
SNMP	System name
	Location
	Contact name
username	
password	
IP-address	
Netmask	
Gateway	
Port setting content	Name, speed, duplex, auto
Bridge Configuration	
Spanning Tree Port Configuration	
VLAN Configuration	
Jumbo Packet / Multicast Rate Configuration	

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