

Secure Terminal Server

STS

Version 1.3.2

2005-05-27

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가 .

HelloDevice™ .

Windows® Microsoft .

Ethernet® XEROX .

가 .

210

137-130,

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Revision history

Revision	Date	Name	Description
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V1.1.0	2004-01-12	O.J. Jung	v1.1.0
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V1.3.1	2004-10-15	O.J. Jung	6 가
V1.3.2	2005-05-18	O.J. Jung	7 가 , PC DTR/DSR

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1.

1.1.

STS Ethernet
() . STS TCP/IP UDP . STS
PPPoE(PPP-over-Ethernet) DSL RS232

DHCP, PPPoE, DNS(DDNS: Dynamic DNS)

DSL
. STS DNS

STS Telnet, ,

Telnet , STS

SSLv2, SSLv3, TLSv1 . 가 , STS
가 IP

STS 가 .
-
- / (POS)
-
-
-

STS RS232 , , ,

1.2.

- STS
- 110V 230V
- CAT5
-
- Quick Start Guide
- Serial/IP Com Port Redirector, HelloDevice Manager
CD-ROM

1.3.

	STS800	STS1600
	8-	16-
	75bps ~ 230Kbps	
	: RTS/CTS,	Xon/Xoff
	RJ45	
	:	
	RS232 Rx, Tx, RTS, CTS, DTR, DSR, DCD, GND	
	: DTR/DSR and RTS/CTS	
Network Interface	RJ45 Ethernet	10/100 Base Ethernet
	IP	
	<ul style="list-style-type: none"> - ARP, IP/ICMP, TCP, UDP, Telnet, SSH v1 & v2, - SSL v2 & v3, TLS v1 - DNS, Dynamic DNS, HTTP, HTTPS, - SMTP with/without Authentication, pop-before SMTP, - DHCP client, NTP, PPPoE, SNMP v1 & v2 	
PCMCIA	PC : ATA 802.11b 10/100 Base-TX	
	ID	
	HTTPS	
	: SSH	
	: SSLv2/v3, TLS v1, 3DES RC4	
	IP	
	SCP	
Modem emulation	AT	
	, telnet, , HelloDevice Manager	
	: Windows 98/ME/NT/2000/XP	
	email	
	telnet,	가
LED	Power Ready 10/100 Base Link, Act : Serial InUse / Rx/ Tx PC	
	: 5°C ~ 50°C	
	: -40°C ~ 66°C	
	5VDC, 1.5A @ 5VDC	110 ~ 240VAC
L x W x H (mm)	245 x 153 x 30 (mm)	432 x 193 x 44.5
	DIN-rail mount option	19 in. rack mountable
(kg)	1.5	2.8
	FCC(A), CE(A), MIC	

1.4.

STS

MAC

LAN

MAC(Media Access Control)

(Ethernet LAN Ethernet .)

MAC

6 OUI(Organization Unique Identifier) 6
12 STS MAC

00-01-95-xx-xx-xx ,

“ ”

가

IP

“ ” “ ”가

(" ").

/

/

,

/

HTML

HTML

ISP	Internet Service Provider
PC	Personal Computer
NIC	Network Interface Card
MAC	Media Access Control
LAN	Local Area Network
UTP	Unshielded Twisted Pair
ADSL	Asymmetric Digital Subscriber Line
ARP	Address Resolution Protocol
IP	Internet Protocol
ICMP	Internet Control Message Protocol
UDP	User Datagram Protocol
TCP	Transmission Control Protocol
DHCP	Dynamic Host Configuration Protocol
SMTP	Simple Mail Transfer Protocol
FTP	File Transfer Protocol
PPP	Point-To-Point Protocol
PPPoE	Point-To-Point Protocol over Ethernet
HTTP	HyperText Transfer Protocol
DNS	Domain Name Service
DDNS	Dynamic Domain Name Service
SNMP	Simple Network Management Protocol
RADIUS	Remote Access for Dial-In User Service
SSH	Secure Shell
NTP	Network Time Protocol
UART	Universal Asynchronous Receiver/Transmitter
Bps	Bits per second (baud rate)
DCE	Data Communications Equipment
DTE	Data Terminal Equipment
CTS	Clear to Send
DSR	Data Set Ready
DTR	Data Terminal Ready
RTS	Request To Send
DCD	Data Carrier Detect

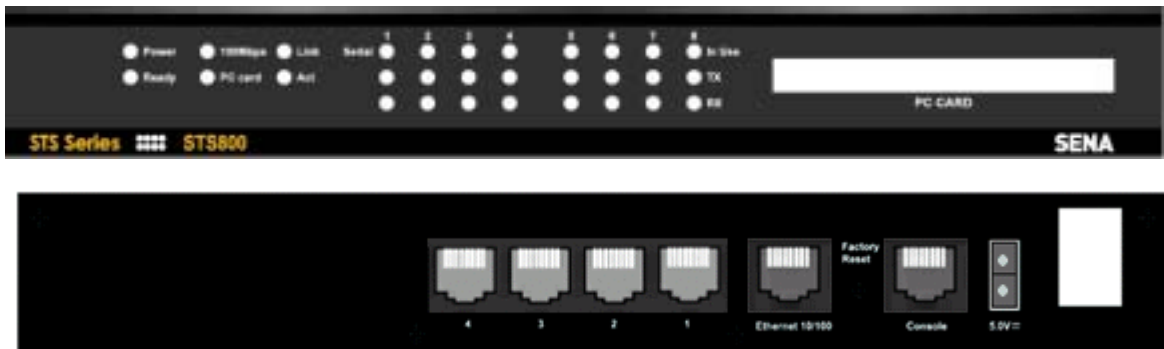
2.

- STS
- 2.1 LED
- 2.2 STS
- 2.3 telnet STS
- ()
- /Ethernet ()
- ()
- (NIC)가 PC RS232

2.1.

2.1.1. STS800

- 2-1 STS800 LED 가
- (: System, Ethernet Serial Ports).
- (Power), (Ready) PC (PC Card Interface)
- Ethernet 100Mbps(Ethernet 100Mbps), (Link),
- (Act) (Receive) (Transmit)
- 2-1 LED RJ45
- Ethernet , STS400



2-1 STS800

2-1 STS LED

System	Power	
	Ready	가
	PC card	PCMCIA 가
Ethernet	100Mbps	100Base-TX
	LINK	Ethernet
	Act	STS Ethernet 가
Serial port	InUse	가
	Rx/Tx	STS 가

2.1.2. STS1600 Panel Layout

2-2 STS1600 LED 가

(: System, Ethernet Serial Ports).

(Power), (Ready) PC (PC Card Interface)

Ethernet 100Mbps(Ethernet 100Mbps), (Link),

(Act) (Receive) (Transmit)

2-1 LED



2-2 STS1600

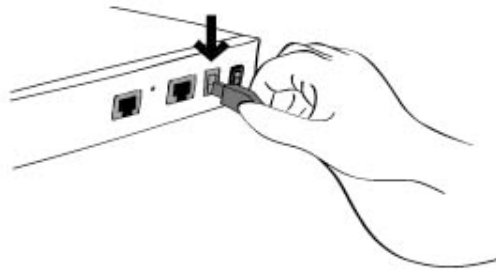
2.2.

- , STS
- STS
- STS Ethernet
-

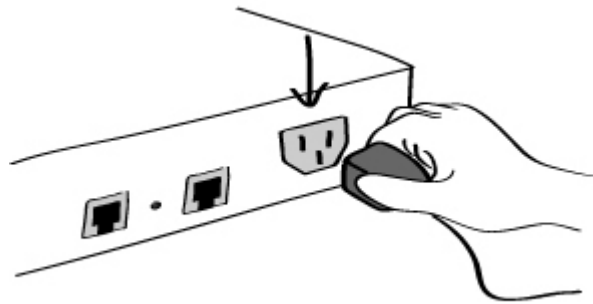
2.2.1.

STS

[Power]



2-3 STS800



2-4 STS1600

2.2.2.

Ethernet

STS

Ethernet

Ethernet

, STS

Ethernet

- [Link]

- [Act]

- STS

가 100Base-TX

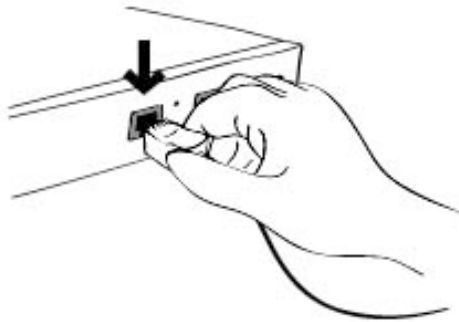
Ethernet

[100Mbps]

-

10Base-T

[100Mbps]

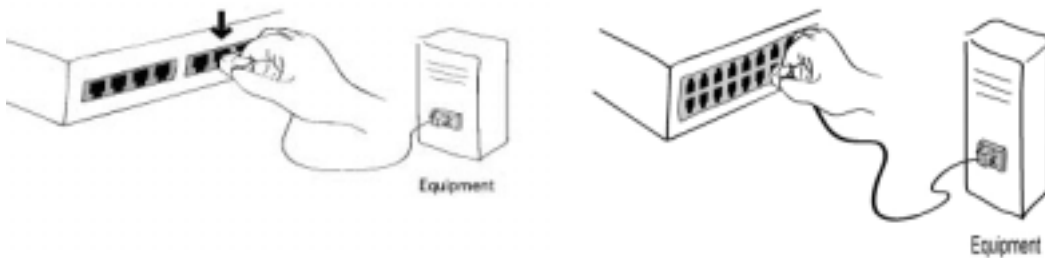


2-5 STS800/1600

2.2.3.

STS 가 가 . STS

1.



2-6 STS800() / STS1600()

2.2.4.

STS 가 가 , 가 , STS , GUI(Graphic User Interface) CLI(Command Line Interface) ..

- :
/Ethernet STS

- :
STS

telnet(TCP 23)

- :
STS Internet Explorer

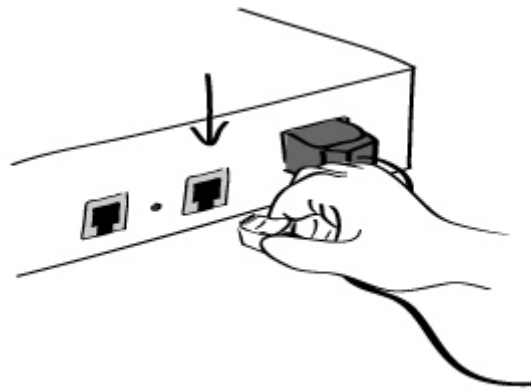
Netscape Navigator STS

SUPER

2.2.5.

1) /Ethernet

STS



2-7 STS

2) RJ45-DB9 (female adapter)

3)

4) (HyperTerminal)

- 9600 Baud rate
- Data bits 8
- Parity None
- Stop bits 1
- No flow control

5) [ENTER]

6) STS

Login: root Password: root

Login: admin Password: admin

```
192.168.161.5 login: root
Password:****
root@192.168.161.5:~#
```

7) CLI . CLI 8 CLI

8) 가 "ss.edit" , 2-8

```
root@192.168.161.5:~#ss.edit
```

```
-----
Welcome to STS-800 configuration page
Current time: 08/22/2003 21:52:36 F/W REV.: v1.0.1
Serial No.: STS800438349-42944 MAC address: 00-01-95-04-19-5a
IP mode: DHCP IP address: 192.168.14.7
-----
```

```
Select menu:
1. Network configuration
2. Serial port configuration
3. PC Card configuration
4. System administration
5. Save changes
6. Exit without saving
7. Exit and apply changes
8. Exit and reboot
<Enter> Refresh
----->
```

2-8 (STS800)

[ENTER] STS

STS

가 5. Save Changes

7. Exit and Apply Changes 8. Exit and Reboot

2.2.6.

```
STS STS IP
. ( 3. ). STS
IP 192.168.161.5
disable .(
```

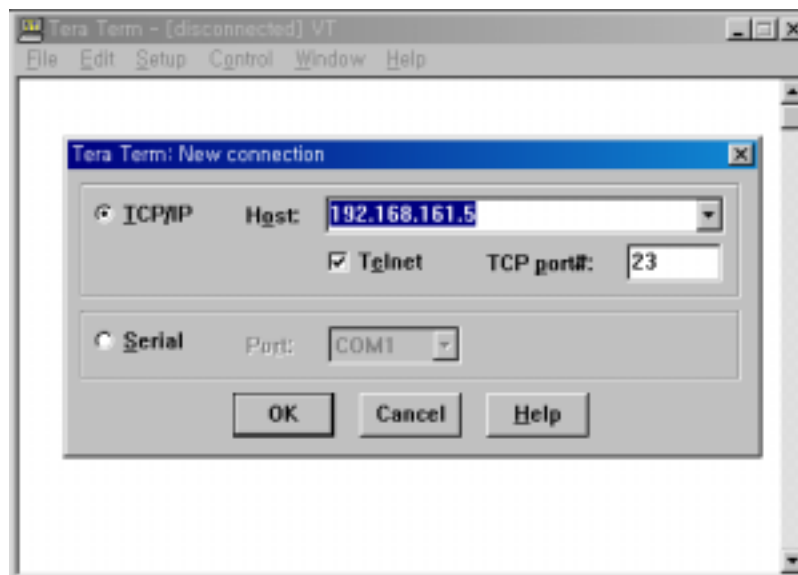
3.5 IP .)

The following instructions will assist in setting up the Remote Console functionality:

- 1) Telnet (, TeraTerm-Pro Hyper Terminal)
 . IP port number STS
 , port number 23 .

```
telnet 192.168.161.5
```

telnet .



2-9 Telnet

(TeraTerm Pro)

- 2) STS ,
 root root

admin 가

- 3) STS 가 , CLI .

2.3.

STS HTTP HTTPS(HTTP over SSL) . STS
 . STS , STS

IP 가 URL/Location
STS

Login: root Password: root
Login: admin Password: admin

: STS STS
IP (가)



2-10 STS

2-100 STS

가 (Configuration page)

, 2-18 STS

2-111 STS

가

가

가

[(Cancel)] [(Save to flash)], [(Save & apply)] [(Save to Flash)]

[(Apply Changes)]

가 [(Apply Changes)]

STS

[(Save & Apply)]

가

[(Cancel)]



Network

- IP configuration
- SNMP configuration
- Dynamic DNS configuration
- SMTP configuration
- IP filtering
- SYSLOG server configuration
- NFS server configuration
- Web server configuration
- Ethernet configuration
- TCP service configuration

Serial port

PC card

System administration

System statistics

Apply changes

Login as a different user

Logout

Reboot

IP configuration

IP mode :	Static
IP address :	192.168.161.5
Subnet mask :	255.255.0.0
Default gateway :	192.168.1.1
Primary DNS (0.0.0.0 for auto) :	168.126.63.1
Secondary DNS (optional) :	168.126.63.2
PPPoE user name :	whoever
PPPoE password :	*****
Confirm PPPoE password :	*****

Save to flash

Save & apply

Cancel

3.

3.1. IP

STS , IP 가 . IP 가
STS IP 가
STS IP , 3

- **Static IP**
- **DHCP** (Dynamic Host Configuration Protocol)
- **PPPoE** (Point-to-Point Protocol over Ethernet)

The STS Series is initially defaulted to **STATIC** mode, with a static IP address of **192.168.161.5**.

3-1 shows the configuration parameters for all three IP configurations. 3-1 shows the actual web-based GUI to change the user's IP configuration.

3-1 IP

Static IP	IP address
	Subnet mask
	Default gateway
	Primary DNS/ Secondary DNS
DHCP	Primary DNS/ Secondary DNS (Optional)
PPPoE	PPPoE Username
	PPPoE Password
	Primary DNS/ Secondary DNS (Optional)

IP configuration	
IP mode :	Static
IP address :	192.168.16.1
Subnet mask :	255.255.0.0
Default gateway :	192.168.1.1
Primary DNS (0.0.0.0 for auto) :	168.126.63.1
Secondary DNS (optional) :	168.126.63.2
PPPoE user name :	whoever
PPPoE password :	*****
Confirm PPPoE password :	*****

3-1 IP

3.1.1. Static IP

가 static IP , STS IP , Subnet mask, gateway
 DNS server가 .

: STS , .

- IP address

Static IP

IP
 IP

: 192.168.1.x IP ISP (Internet Service Provider)가
 (private) . STS

IP

ISP

IP

- Subnet mask

LAN
 가 STS
 TCP/IP 가 . 가 STS
 (Physical address)

- **Default gateway**

가
ISP
STS 가 IP
IP

- **Primary and Secondary DNS**

가 , IP
DNS(Domain Name System) , DNS
IP . **sena.com**
가 . DNS
TCP/IP IP
STS DNS
DNS IP . STS **Primary DNS server**
Secondary DNS server DNS IP . Secondary
DNS Primary DNS

3.1.2. DHCP

(DHCP) 가 IP
. DHCP 가 IP
가
IP
Static IP , IP . 가
IP , IP 가 DHCP
IP , , DNS 가
. DHCP IP 가 ,
“ (lease)” . IP DHCP
IP 가 DHCP
DHCP , STS ,
DHCP . DHCP IP ,
, DNS “ ” . STS
. “ ”가 , STS DHCP ” ”

. DHCP 가 , STS
IP . DHCP 가 , STS
DHCP IP .
: DHCP DNS STS
.. DNS 가 , primary secondary DNS IP
. DNS , primary
secondary DNS IP 0.0.0.0 () .
DHCP 가 IP IP .
DHCP , STS 가 IP .
DHCP IP 가 STS
. DHCP IP STS
STS MAC .

3.1.3. PPPoE

PPPoE Ethernet LAN()
PPPoE
ADSL,
PPPoE STS PPPoE ADSL PPPoE
가 . STS PPPoE ADSL
STS PPPoE
STS STS PPPoE .
STS IP , , DNS
. STS 가 .
STS PPPoE .
: PPPoE DNS STS
. DNS 가 , primary secondary
DNS IP . DNS ,
primary secondary DNS IP 0.0.0.0 () .

3.2. SNMP Configurations

STS SNMP v1 v2 SNMP(Simple Network Management Protocol)

NMS SNMP

STS

SNMP GET, SET, GET-Next, TRAP (TRAPs), (GET), (SET). SNMP v2

GET-Bulk 가

SNMP MIB-II , TRAP

3-2 SNMP

SNMP configuration

MIB-II system objects

sysContact :	<input style="width: 90%;" type="text" value="administrator"/>
sysName :	<input style="width: 90%;" type="text" value="SS800"/>
sysLocation :	<input style="width: 90%;" type="text" value="my location"/>
sysService :	<input style="width: 90%;" type="text" value="7"/>
EnableAuthenTrap :	<input type="button" value="Yes"/> ▾
EnableLoginTrap :	<input type="button" value="No"/> ▾
EnableLinkUpTrap :	<input type="button" value="No"/> ▾

Access control settings (NMS)

IP Address	Community	Permission
<input style="width: 90%;" type="text" value="0.0.0.0"/>	<input style="width: 90%;" type="text" value="public"/>	<input type="button" value="Read only"/> ▾
<input style="width: 90%;" type="text" value="0.0.0.0"/>	<input style="width: 90%;" type="text" value="public"/>	<input type="button" value="Read only"/> ▾
<input style="width: 90%;" type="text" value="0.0.0.0"/>	<input style="width: 90%;" type="text" value="public"/>	<input type="button" value="Read only"/> ▾
<input style="width: 90%;" type="text" value="0.0.0.0"/>	<input style="width: 90%;" type="text" value="public"/>	<input type="button" value="Read only"/> ▾

Trap receiver settings

IP Address	Community	Version
<input style="width: 90%;" type="text" value="0.0.0.0"/>	<input style="width: 90%;" type="text" value="public"/>	<input type="button" value="v1"/> ▾
<input style="width: 90%;" type="text" value="0.0.0.0"/>	<input style="width: 90%;" type="text" value="public"/>	<input type="button" value="v1"/> ▾
<input style="width: 90%;" type="text" value="0.0.0.0"/>	<input style="width: 90%;" type="text" value="public"/>	<input type="button" value="v1"/> ▾
<input style="width: 90%;" type="text" value="0.0.0.0"/>	<input style="width: 90%;" type="text" value="public"/>	<input type="button" value="v1"/> ▾

3-2 SNMP

3.2.1. MIB-II (MIB-II system objects)

MIB-II (Authentication-failure traps) STS SNMP 가
 sysName, sysContact, sysLocation, sysService enableAuthenTrap MIB-II (OID)가

OID

- sysContact: (STS)
- sysName: FQDN(Fully Qualified Domain Name)
- sysLocation: (, 384 , ,)
- sysService() : STS (7)
- EnableAuthenTrap: SNMP 가 ;
- EnableLinkUpTraps: SNMP 가 Ethernet
- EnableLoginTrap: SNMP 가

가 MIB 가 ,
 . MIB SNMP RFC 1066, 1067, 1098, 117, 1318 1213

3.2.2. (Access control settings)

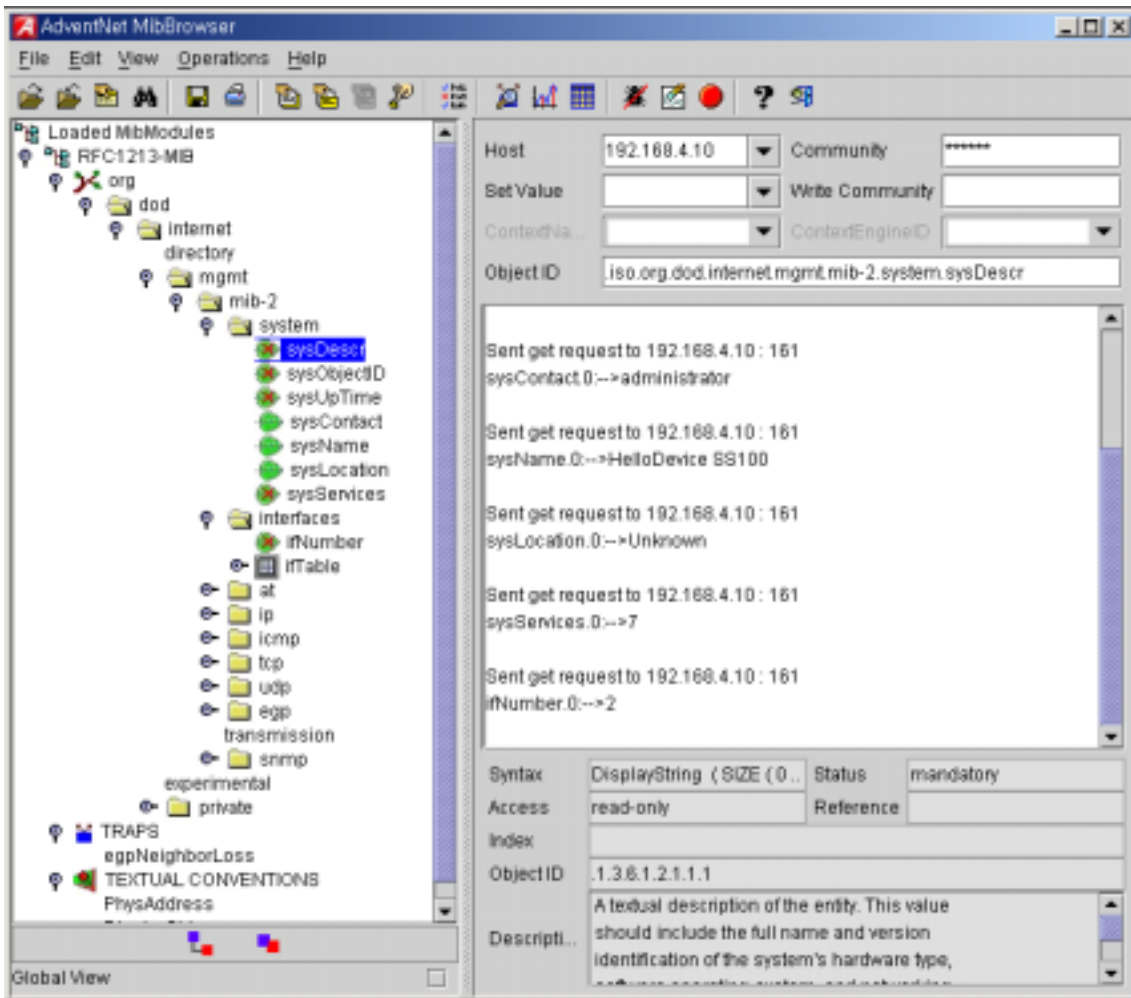
STS SNMP
 STS SNMP
 IP 가 (IP 0.0.0.0
), 가 STS SNMP

3.2.3. (Trap receiver settings)

STS SNMP (TRAP)

3.2.4. SNMP

NMS() SNMP SNMP STS 가 NMS SNMP 가
 NMS SNMP
 3-3 STS SNMP MIB-II OID
 SNMP



3-3 SNMP STS SNMP MIB-II OID
 (AdventNet MIB)

3.3. DNS(Dynamic DNS)

가 STS DSL DHCP ,
 , IP 가 . IP
 , IP 가 . 가 telnet
 DNS , ISP
 . DNS , IP DNS
 STS .
 , STS Dynamic DNS Network Services (www.dyndns.org)
 DNS . DNS
 Dynamic DNS Network Services가 DNS ,
 NIC(Network Information Center-http://members.dyndns.org)
 Dynamic DNS Network Services Members NIC DNS
 가 .
 DNS , DNS 가 가 , Domain
 name, User name Password .
 Domain name STS
 3-4 DNS

Dynamic DNS configuration	
Dynamic DNS :	Enabled ▾
Domain Name :	ss800.dyndns.biz
User Name :	ss800-user
Password :	*****
Confirm password :	*****

3-4 DNS

3.4. SMTP

가 , STS SMTP
 email .
 . STS 3가 SMTP .
 • SMTP
 • SMTP
 • POP-before-SMTP

3-6. SMTP

SMTP

- SMTP server IP address
- SMTP user name
- SMTP user password
- Device mail address

Device mail address email , , STS
 . SMTP Server email .
 , email (i.e. arbitrary_user@yahoo.com or
 anybody@sena.com) user name .
 SMTP POP-before-SMTP mode가 , SMTP
 SMTP password가 .

SMTP configuration

SMTP enable/disable :	<input type="text" value="Enabled"/>
SMTP server name :	<input type="text" value="smtp.yourcompany.com"/>
SMTP mode :	<input type="text" value="SMTP without authentication"/>
SMTP user name :	<input type="text" value="admin"/>
SMTP password :	<input type="password" value="*****"/>
Confirm SMTP password :	<input type="password" value="*****"/>
Device mail address :	<input type="text" value="SS800@yourcompany.com"/>

3-5 SMTP

SMTP configuration	
SMTP enable/disable :	Enabled ▾
SMTP server name :	smtp.yourcompany.com
SMTP mode :	SMTP without authentication ▾
SMTP user name :	POP before SMTP
SMTP password :	SMTP without authentication
Confirm SMTP password :	SMTP authentication
Confirm SMTP password :	*****
Device mail address :	SS800@yourcompany.com

3-6 SMTP

SMTP

3.5. IP

STS IP 가

STS

- IP 가 STS
- STS
- 가 STS

Telnet , SSH

(enabled)

(disabled)

IP

IP

“(Enabled)”

STS

IP

STS

STS

IP

255.255.255.255

가 STS

, IP

0.0.0.0

3-2

“Any()”

IP filtering

Telnet IP filtering

Configuration via telnet :

Allowed base host IP :

Subnet mask to be applied :

SSH IP filtering

Configuration via ssh :

Allowed base host IP :

Subnet mask to be applied :

Web IP filtering

Configuration via web :

Allowed base host IP :

Subnet mask to be applied :

3-7 IP

3-2

Allowable Hosts	Input format	
	Base Host IP address	Subnet mask
Any host	0.0.0.0	0.0.0.0
192.168.1.120	192.168.1.120	255.255.255.255
192.168.1.1 ~ 192.168.1.254	192.168.1.0	255.255.255.0
192.168.0.1 ~ 192.168.255.254	192.168.0.0	255.255.0.0
192.168.1.1 ~ 192.168.1.126	192.168.1.0	255.255.255.128
192.168.1.129 ~ 192.168.1.254	192.168.1.128	255.255.255.128

“Enabled” ” Disabled” IP .

“Enabled” . “ (Enabled)” STS

() .

3.6. SYSLOG

STS , SYSLOG service

facility . SYSLOG service , SYSLOG IP .

3-8 SYSLOG server configuration

SYSLOG server configuration

SYSLOG service :

SYSLOG server IP address :

SYSLOG facility :

3-8 SYSLOG

“remote reception allowed”
 가 , 가
 가 .
 STS local0 local7 SYSLOG Facility .
 Facility , SYSLOG STS .
 SYSLOG service가 가 SYSLOG ,
 STS
 SYSLOG / **4.3.10**
6.2

3.7. NFS

STS NFS(Network File System) NFS
 NFS IP
 NFS 3-9 NFS

NFS server configuration

NFS service :

NFS server IP address :

Mounting path on NFS server :

3-9 NFS

STS NFS , STS NFS
 “ read and write allowed ” . STS NFS
 , 가 UDP 가
 NFS 가 가 NFS , STS
 NFS /
 4.2.110 6.2

3.8. Ethernet

STS Ethernet mode .
 - Auto Negotiation
 - 100 BaseT Half Duplex
 - 100 BaseT Full Duplex
 - 10 BaseT Half Duplex
 - 10 BaseT Full Duplex
 Ethernet mode , Ethernet mode
 Auto Negotiation , Auto Negotiation
 가 . Ethernet mode , STS
 가 .

Ethernet configuration

Ethernet mode : Auto Negotiation ▼

Save to flash
Save & apply
Cancel

3-10 Ethernet

3.9. Web server configuration

STS HTTP HTTPS(HTTP Over SSL)
 Enabled Disabled . 3-11

Web server configuration	
HTTP service :	Enabled ▾
HTTPS service :	Enabled ▾
Web page refresh rate for statistics data display (0-1800, 0 for no refresh) :	10 seconds
Default web page :	Configuration page ▾
Customer web start page :	<input checked="" type="radio"/> HTML (index.html) <input type="radio"/> CGI (cgi-bin/default)

3-11

(web page refresh rate)

, IP, ICMP, TCP

UDP

(Refresh) 7.

3.10. TCP

TCP lock-up

lock-up

lock-up, STS TCP keep-alive

STS 가 keep alive

STS TCP "keepalive" 3

- TCP keepalive time (sec):
keepalive 15
- TCP keepalive probes (times):
keepalive 가 3
- TCP keepalive intervals (sec):
Keepalive 5

3 , STS 가 15 가 5
keepalive .

TCP service configuration	
TCP keepalive time(sec) :	<input type="text" value="15"/>
TCP keepalive probes(times) :	<input type="text" value="3"/>
TCP keepalive intervals(sec) :	<input type="text" value="5"/>

3-12 TCP keep-alive

4.

4.1.

host mode,

host mode

- **TCP :**

TCP

TCP

. TCP

, TCP

, TCP

가

- **UDP :**

UDP

UDP

TCP

- **Modem emulation :**

AT

가

AT

port logging

server PC

ATA/IDE fixed disk card

MEMORY, SYSLOG server, NFS

. port event

STS

email SNMP trap

MEMORY

STS

SYSLOG server, NFS server

PC

ATA/IDE fixed disk card

4-1

All serial ports setting Or Individual serial port setting #1~#8(1/4)	Port Enable/Disable			
	Port title			
	Apply all port settings (Individual serial port setting only)			
	Host mode	TCP	TCP listening port	
			Telnet protocol	
			Max allowed connection	
			Cyclic connection	
			Inactivity timeout (0 for unlimited)	
		UDP	UDP listening port	
			Max allowed connection	
			Accept UDP datagram from unlisted remote host or not	
			Send to recent unlisted remote host or not	
			Inactivity timeout (0 for unlimited)	
	Modem emulation			
	Remote host¹	Add or Edit a remote host ²		
		Primary host address Primary host port Secondary host address Secondary host port		
	Remove a remote host			
	Port IP filtering³	Allowed host IP		
		Subnet mask to be applied		
	Cryptography⁴	Encryption method		
		None/SSLv2/SSLv3/SSLv3 rollback to v2/TLSv1/3DES/RC4		
		Cipher suite selection		
		Verify client (server mode only)		
		Verify certificate chain depth		
	Check the certificate CN			
	Serial Port Parameters	Type		
		Baud rate		
		Data bits		
		Parity		
		Stop bits		
		Flow control		
		DTR behavior		
DSR behavior				
Inter-character timeout (ms)				
Modem	Enable/Disable modem			
	Modem init-string			
	DCD behavior			
Port logging	Enable/Disable Port logging			
	Port log storage location			
	Port log buffer size			
	Display port log			
Port event handling	Enable/Disable port event handling			
	Notification interval			
	Email notification	Enable/Disable Email notification		
		Title of Email		
Recipient's Email address				

¹ TCP/UDP mode only.

² A secondary remote host is available for connection-fail backup in TCP mode

³ TCP/UDP mode only.

⁴ TCP mode only

		SNMP notification	Enable/Disable SNMP notification
			Title of SNMP trap
			SNMP trap receiver's IP address
			SNMP trap community
			SNMP trap version
		Add/Edit a keyword Keyword string Email notification SNMP trap notification Port command	
		Remove a keyword	
All serial ports setting Or Individual serial port setting #1~#8(1/4)	Port Enable/Disable		
	Port title		
	Apply all port settings (Individual serial port setting only)		
	Host mode	TCP	TCP listening port
			Telnet protocol
			Max allowed connection
			Cyclic connection
			Inactivity timeout (0 for unlimited)
		UDP	UDP listening port
			Max allowed connection
			Accept UDP datagram from unlisted remote host or not
			Send to recent unlisted remote host or not
			Inactivity timeout (0 for unlimited)
	Modem emulation		
	Remote host⁵	Add or Edit a remote host ⁶ Primary host address Primary host port Secondary host address Secondary host port	
		Remove a remote host	
	Port IP filtering⁷	Allowed host IP	
		Subnet mask to be applied	
	Cryptography⁸	Encryption method None/SSLv2/SSLv3/SSLv3 rollback to v2/ TLSv1/3DES/RC4	
		Cipher suite selection	
		Verify client (server mode only)	
		Verify certificate chain depth	
		Check the certificate CN	
	Serial Port Parameters	Filter application arguments	
		Type	
Baud rate			
Data bits			
Parity			
Stop bits			
Flow control			
DTR behavior			
DSR behavior			
Inter-character timeout (ms)			
Modem	Enable/Disable modem		
	Modem init-string		

⁵ TCP/UDP 該當

⁶ TCP secondary remote host

⁷ TCP/UDP 該當

⁸ TCP 該當

	Port logging	DCD behavior		
		Enable/Disable Port logging		
		Port log storage location		
		Port log buffer size		
		Display port log		
	Port event handling	Enable/Disable port event handling		
		Notification interval		
		Email notification	Enable/Disable Email notification	
			Title of Email	
			Recipient's Email address	
		SNMP notification	Enable/Disable SNMP notification	
			Title of SNMP trap	
			SNMP trap receiver's IP address	
			SNMP trap community	
			SNMP trap version	
		Add/Edit a keyword		
		Keyword string		
Email notification				
SNMP trap notification				
Port command				
Remove a keyword				

4-1

가

Host mode	Description		
	Mode ⁹	Encryption ¹⁰	Telnet ¹¹
TCP	TCP	Disabled	Disabled
TCPs	TCP	Enabled	Disabled
TEL	TCP	Disabled	Enabled
TELS	TCP	Enabled	Enabled
UDP	UDP	* ¹²	*
Modem Emulation	Modem Emulation	*	*

, [All port configuration]

[All]

[Port

Title]

⁹ 4.2.4
¹⁰ 4.2.7
¹¹ 4.2.4.1 TCP
¹²

Serial port configuration				
All port configuration				
Port#	Title	Host mode	Local port	Serial-settings
All	Port #	TCP	7001	RS232-9600-N-8-1-No
Individual port configuration				
Port#	Title	Host mode	Local port	Serial-settings
1	Port #1	TCP	7001	RS232-9600-N-8-1-No
2	Port #2	TCPs	7002	RS232-9600-N-8-1-No
3	Port #3	TEL	7003	RS232-9600-N-8-1-No
4	Port #4	UDP	7004	RS232-9600-N-8-1-No
5	Port #5	Modem emulation	7005	RS232-9600-N-8-1-No
6	Port #6	TCP	7006	RS232-9600-N-8-1-No
7	Port #7	TCP	7007	RS232-9600-N-8-1-No
8	Port #8	TELS	7008	RS232-9600-N-8-1-No

4-1

4.2.

STS

12

1. Port enable/disable
2. Port title
3. Apply all port settings
4. Host mode
5. Remote host: *Available only when the host mode is set to TCP or UDP mode*
6. Port IP filtering: *Available only when the host mode is set to TCP or UDP mode*
7. Cryptography: *Available only when the host mode is set to TCP mode and Modem Emulation mode*
8. Serial port parameters
9. Modem configuration
10. Port logging
11. Port event handling: *Available only when the port-logging feature of the port is enabled*

[--- Move to ---]

Serial port configuration - 1 : Port #1 --- Move to --- ▾

Enable/Disable this port

Port title

Port title :

Apply all ports settings

Host mode configuration

Remote host configuration

Port IP filtering

Cryptography configuration

Serial port parameters

Modem configuration

Port logging

Port event handling

4-3 Port title configuration

4.2.3. Apply All Port Settings

가 all ports settings

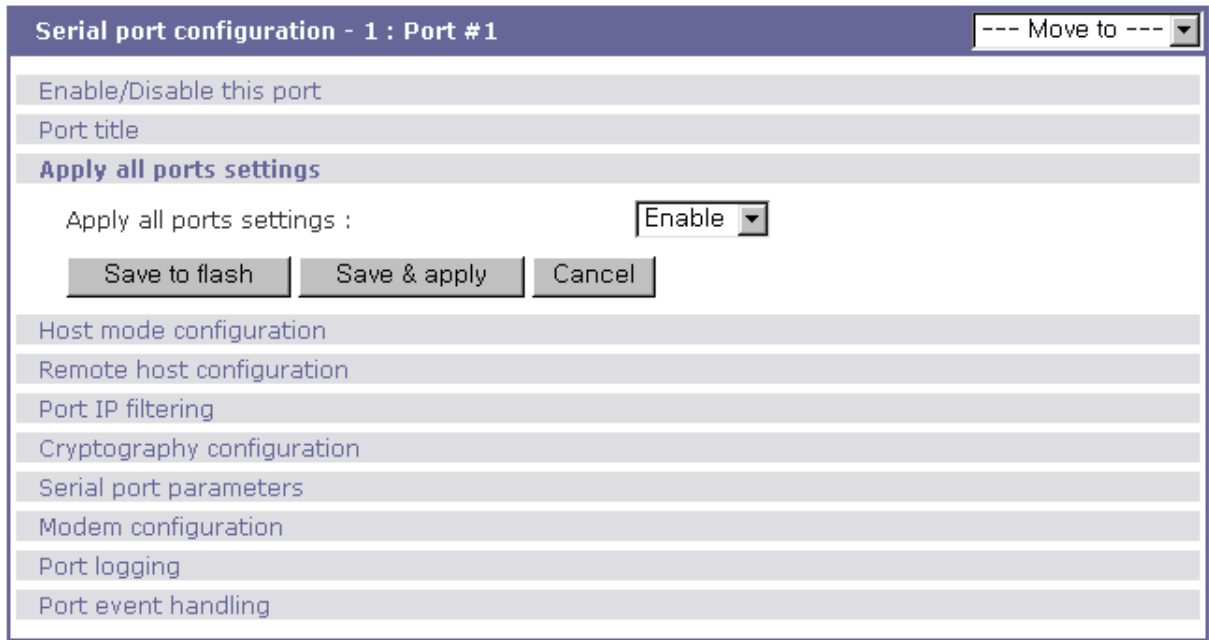
가,

, STS

disable

all ports setting

4-4 **apply all ports settings**



4-4 Apply all port setting configuration.

4.2.4.

STS " " . TCP , UDP ,
가 가 .

TCP

TCP
TCP . TCP TCP , STS
STS 가 . TCP

UDP

UDP UDP TCP

가 AT 가 AT
. TCP .

4-5 .

Serial port configuration - 1 : Port #1 --- Move to --- ▾

Enable/Disable this port

Port title

Apply all ports settings

Host mode configuration

Host mode : ▾

TCP listening port (1024-65535, 0 for only outgoing connections) :

Telnet protocol : ▾

Max. allowed connection (1-32) :

Cyclic connection to remote hosts (sec, 0 : disable) :

Inactivity disconnection timeout (sec, 0 : unlimited) :

Remote host configuration

Port IP filtering

Cryptography configuration

Filter application

Serial port parameters

Modem configuration

Port logging

Port event handling

4-5

4.2.4.1. TCP

TCP

(State Transition Diagram)

가

STS

- [(Listen)]

"

가

"

TCP

- [(Closed)]

"

"

STS

STS

가

[(Listen)]

- [- (Sync-Received)]

가

[(Listen)]

[- (Sync-

Received)] . STS 가 , [(Established)] .

- [(Sync-Sent)]

STS 가 [(Closed)] [(Sync-Sent)] 가 .

- [(Established)]

" (open connection)" . STS 가 [(Established)] .

- [(Data)]

[(Established)] . TCP

[(Data)] , [(Data)] RFC 793 [TCP: Transmission Control Protocol] [(Established)] .

가 .

STS TCP . STS

TCP 가

. TCP TCP [(Listen)] .

1)

[(Listen)] --> [(Sync-Received)] --> [(Established)] --> [(Data)] --> [(Closed)] --> [(Listen)]

Or

[(Listen)] --> [(Sync-Sent)] --> [(Established)] --> [(Data)] --> [(Closed)] --> [(Listen)]

[(Listen)] . 가 TCP

TCP .

TCP

STS 가

가 .

2)

STS 가 , STS

. 가 가

STS

" (Inactivity timeout)" (

4.4 (Options)). TCP STS
가 ,

(Inactivity timeout)" . (" 4.4
(Options)).

TCP TCP client

3)

TCP

가 TCP TCP
. TCP
STS 1024 66635 0 가
(outgoing connection) . (TCP)

TCP , STS COM (RFC2217)
(baud rate),
RFC2217

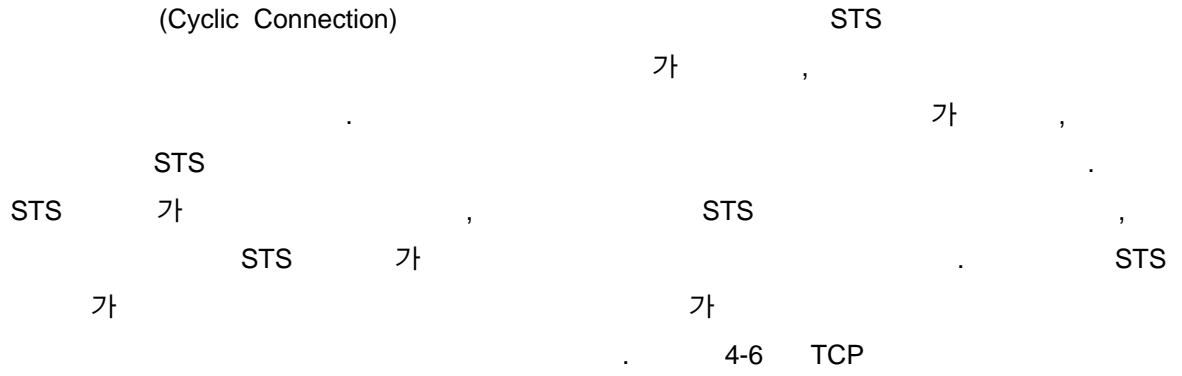
(4.2.9
)

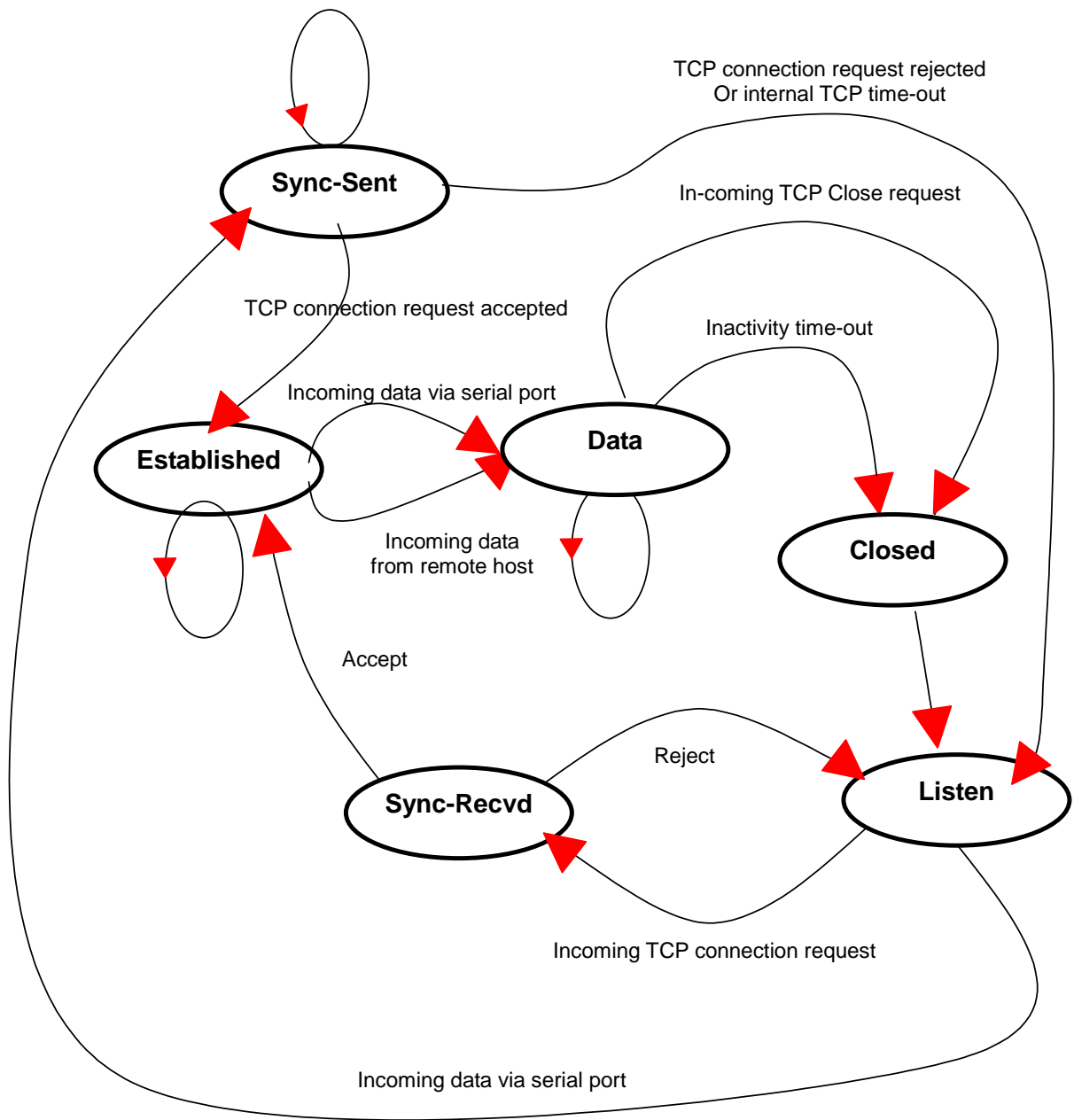
RFC2217 COM
STS

, Tactical Software Serial/IP 가 . COM
Serial/IP . ()
6 Serial/IP STS

STS 32 .
(remote host list configuration)
, 가 (-
) 가 32 ,
STS 3 ,

29(=32 - 3)
4.2.5





4-6 TCP

(Inactivity Timeout)

(Inactivity Timeout)

STS

4.2.4.2. UDP

UDP

UDP

TCP

. UDP

STS

가 .

1)

가 UDP STS UDP , STS
 . 가 , STS
 STS
 UDP ' UDP ' (Yes) UDP
 datagram (Accept UDP datagram from unlisted remote host) ' (Yes)'
 UDP STS 가
 가 , STS
 .
 (Send to recent unlisted remote host)' ' (Yes)' , () STS

2)

UDP
TCP . 4.2.4.1 **TCP**
 .
TCP . 4.2.4.1 **TCP** .
UDP
 ' UDP datagram (Accept UDP datagram from unlisted remote host)' ' (No)' , STS
 UDP
 ' UDP datagram (Accept UDP datagram from unlisted remote host)' ' (Yes)' , STS
 UDP
 ' (Send to recent unlisted remote host)'
 ' (Yes)' , STS STS
 STS
 . STS

(Send to recent unlisted remote host)'

(No)'

STS

. STS

(Inactivity Timeout)

UDP

STS

, STS

, UDP

STS

가

. UDP

가

0

, STS

4.2.4.3.

, AT

-

Ethernet

STS

가

ATA/ATDT

IP ()

-

가

가

ATD(T) XXX

IP ()

가

STS

Ethernet

4-2

STS

AT

4-7

Ethernet

ATDA

4-2 STS

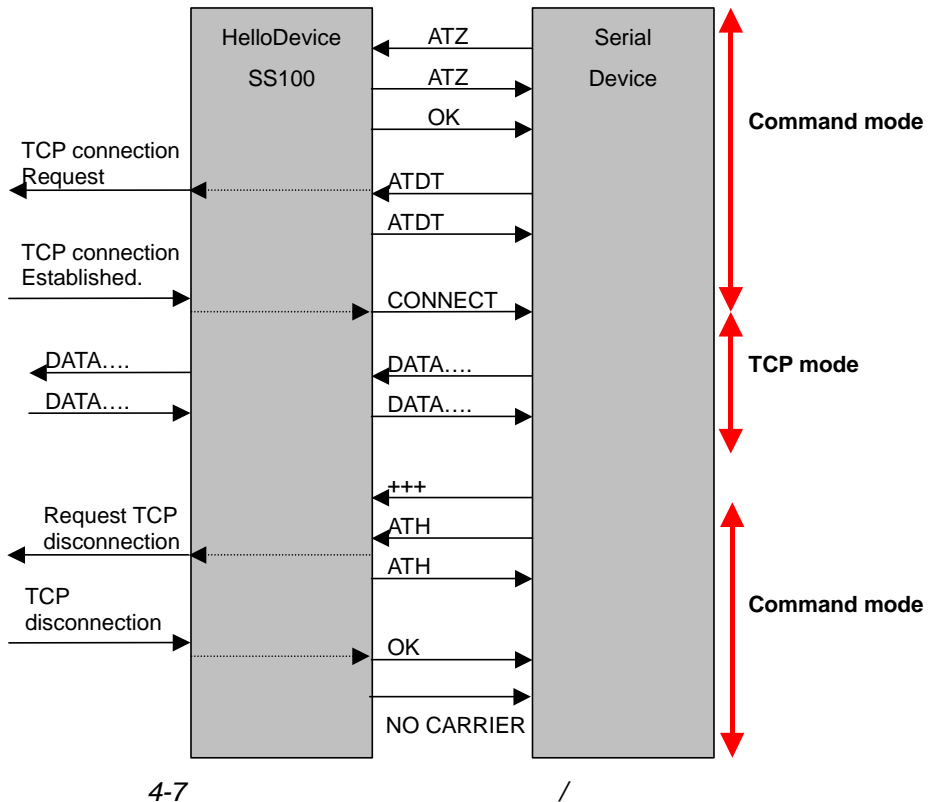
AT

		13 (verbose code)
+++		
ATD(T) [IP]:[] [CR][LF]	TCP TCP) atdt192.168.1.9:1002: IP 192.168.1.9, 1002) atdt	CONNECT [CR][LF] NO CARRIER [CR][LF] 가 ERROR [CR][LF]
AT ATZ [CR][LF]	TCP	OK [CR][LF] ERROR [CR][LF] OK [CR][LF] ERROR [CR][LF]
ATA/ [CR][LF]		
ATA [] [CR][LF]	TCP TCP , TCP [(Listen)] TCP , 가 TCP , 가	
ATEn [CR][LF]	E, E0: E1:	
ATHn [CR][LF]	H, H0, H1: TCP 가	
ATOn [CR][LF]	O, O0:	
ATQn [CR][LF]	Q, Q0: () Q1:	
ATVn [CR][LF]	V, V0: = <numeric code> [CR][LF] V1 (): = <verbose code> [CR][LF]	
AT&Dn [CR][LF]	D, D0: DTR(PC) D2(): TCP	
AT&Fn [CR][LF]	F, F0, F1:	
AT&Kn [CR][LF]	K, K0: 가 K3: RTS/CTS () K4: Xon/Xoff ()	
AT&Sn [CR][LF]	S, S0: DSR(PC) S1: DSR(PC)가 TCP	
ATIn [CR][LF]	I, I0 : "Sena Technologies, Inc." I3 : : "OK"	
AT\Tn [CR][LF]	\T, \T0: n ()	OK [CR][LF]

ATBn, ATCn, ATLn, ATMn, ATNn, ATP, ATT, ATYn, AT% <i>Cn</i> , AT% <i>En</i> , AT&Bn, AT&Gn, AT&In, AT&Qn, AT&V, AT}Mn, ATVAn, AT\Bn, AT\Nn		OK [CR][LF]
ATS?, ATSn= <i>x</i> , AT&Cn, AT&Wn, AT&Zn= <i>x</i>		ERROR [CR][LF]
ATFn [CR][LF]		n 1 OK [CR][LF] ERROR [CR][LF]
ATWn, ATXn		n 0 OK [CR][LF] ERROR [CR][LF]

4-3 AT

(Verbose Code) ("ATV1")	(Numeric Code) ("ATV0")	
OK	0	
CONNECT	1	
RING	2	가
NO CARRIER	3	
ERROR	4	



4.2.5.

(Remote Host Configuration) STS

STS

TCP , STS 가 1
2 . 1
, STS 1 2
1

16

UDP STS 가 1
1 . 2 가 .
4-8 . (TCP)

Serial port configuration - 1 : Port #1 --- Move to --- ▾

Enable/Disable this port

Port title

Apply all ports settings

Host mode configuration

Remote host configuration

Check	Host #	Primary remote host IP	Port #	Secondary remote host IP	Port #
<input type="checkbox"/>	1	192.168.14.1	6001	192.168.13.1	5001
<input type="checkbox"/>	2	192.168.14.1	6002	192.168.13.1	5002

Action on remote host : Add Edit Remove

Primary host address :

Primary host port :

Secondary host address :

Secondary host port :

Port IP filtering

Cryptography configuration

Serial port parameters

Modem configuration

Port logging

Port event handling

4.2.6. Port IP filtering

STS IP filtering
 IP subnet mask 가 STS
 3.5

The screenshot shows a configuration window titled "Serial port configuration - 1 : Port #1". The "Port IP filtering" section is active, showing "Allowed host IP" set to "0.0.0.0" and "Subnet mask to be applied" set to "0.0.0.0". Below these fields are three buttons: "Save to flash", "Save & apply", and "Cancel". Other sections visible include "Enable/Disable this port", "Port title", "Apply all ports settings", "Host mode configuration", "Remote host configuration", "Cryptography configuration", "Serial port parameters", "Modem configuration", "Port logging", and "Port event handling".

4-9 Port IP filtering for serial ports

4.2.7.

STS (UDP) TCP

4.2.7.1. Secure Sockets Layer(SSL) Transport Layer Security(TLS)

By setting the cryptography method as one of SSLv2, SSLv3, SSLv3 rollback to v2 or TLSv1, the STS
 가 SSL/TLS

SSL Netscape . SSL

HTTP

. SSL , , 가

. SSL . SSL

TCP/IP

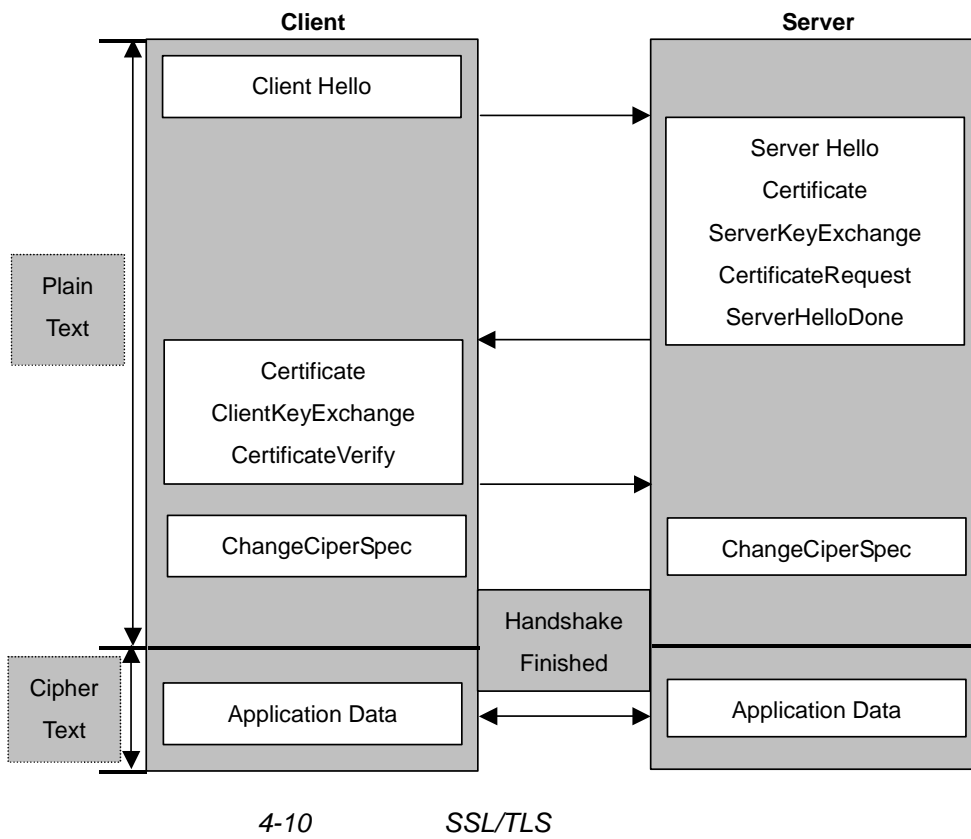
TLS SSL . Internet Engineering Task Force (IETF)

Internet RFC . TLS SSL
 가 , SSL 가
 TLS .

SSL/TLS SSL
 . SSL/TLS (public-key) (symmetric key)
 . (symmetric key) (public-key) 가
 . 가
 , .
 . ∴

1. 가 SSL/TLS , (cipher) ,
 , 가 SSL/TLS
2. 가 SSL/TLS , (cipher) ,
 , 가 SSL/TLS
 . 가
3. 가 . 가
 . 가
4. premaster secret (2)
 premaster secret .
 (cipher) 가 SSL/TLS
 “ ”
5. 가 ()
 가 premaster secret
6. 가 , 가
 . 가
 (private key) premaster secret
 (premaster secret)
 (master secret) .

- 7. / SSL/TLS (session key) SSL/TLS
- 8. (integrity)
- 9.
- 10. SSL/TLS 가 SSL/TLS



STS TCP SSL/TLS
 SSL/TLS TCP , STS SSL
 SSL/TLS , SSL/TLS TCP STS
 STS SSL TCP STS
 SSL/TLS

가 SSL/TLS

• **(Cipher suites) /**

Cipher suites SSL/TLS (asymmetric), (symmetric)

(hash)

()

(identity)

SSL/TLS

가

가 SSL/TLS

가

cipher suite

cipher suite

가

cipher suite

cipher suite

cipher suite

. RSA

cipher suite 가

STS

cipher suite

cipher suite

cipher suite

• **()**

가

“ ”

, STS

SSL

(2)

가

“ ”

, STS

SSL

(2)

• **(certificate chain depth)**

가

((peer))

CA

. CA (peer)

가 CA

가

. STS

STS

가

CA

• **CN**

가

CN

“ ”

, STS

CN()

STS

가 CN
 “ ” , STS CN()
 STS SSL/TLS CN()

Serial port configuration - 1 : Port #1 --- Move to --- ▾

Enable/Disable this port

Port title

Apply all ports settings

Host mode configuration

Remote host configuration

Port IP filtering

Cryptography configuration

Encryption method : SSLv2 ▾

Enable/Disable cipher suites :

- SSL_CK_RC4_128_WITH_MD5
- SSL_CK_RC4_128_EXPORT40_WITH_MD5
- SSL_CK_RC2_128_CBC_WITH_MD5
- SSL_CK_RC2_128_CBC_EXPORT40_WITH_MD5
- SSL_CK_IDEA_128_WITH_MD5
- SSL_CK_DES_64_CBC_WITH_MD5
- SSL_CK_DES_192_EDE_CBC_WITH_MD5

Verify client (server mode only) : NO ▾

Verify certificate chain depth : 3

Check the certificate CN : NO ▾

Save to flash Save & apply Cancel

Serial port parameters

Modem configuration

Port logging

Port event handling

4-11

4.2.7.2. 3DES

3DES STS 3DES(168 bits) STS
 HelloDevice STS
 4.12 3DES

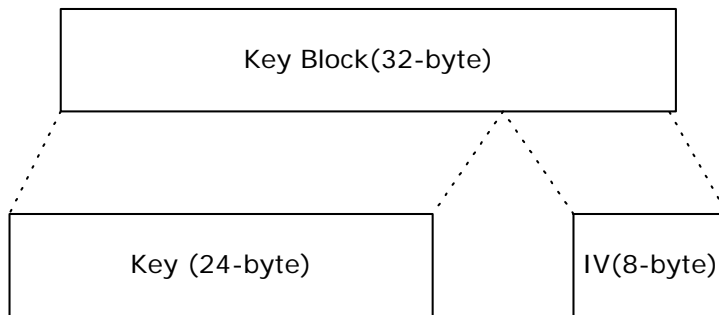


4-12 3DES

- 8-bits (cipher) () 3DES 64
8(64/8)

- (Padding) (cipher) (1~8)

STS 3DES 4-13



4-13

Key_Block = MD5(KEY_STRING) + MD5(MD5(KEY_STRING)+KEY_STRING)
 = (16 bytes) + (16 bytes)
 Key = 24bytes
 IV(Initial Vector) = Bytes

4.2.7.3. RC4

RC4 STS RC4 STS
 RC4 STS TCP
 RC4 3DES 가 RC4

4.2.8. Serial port parameters

4.2.9.

STS
가
(baud rate), , , , , DTR/DSR
(inter-character)

STS RS232
1

- **(Baud rate)**

STS :
75, 150, 200, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200,
230400

9600 .

- **(Data bits)**

7 bits 8 bits . 8 bits .

Serial port configuration - 1 : Port #1 --- Move to --- ▾

Enable/Disable this port

Port title

Apply all ports settings

Host mode configuration

Remote host configuration

Port IP filtering

Cryptography configuration

Serial port parameters

Baud rate : ▾

Data bits : ▾

Parity : ▾

Stop bits : ▾

Flow control : ▾

DTR behavior : ▾

DSR behavior : ▾

Inter character time-out (0-10000 msec) :

Modem configuration

Port logging

Port event handling

4-14 UART

- **(Parity)**

none, even	odd	none
------------	-----	------
- **(Stop bits)**

1 bit	2 bit	1 bit
-------	-------	-------
- **(Flow control)**

RTS/CTS	None	STS
		XON/XOFF
		(XON/XOFF(0x11/0x13))

:
 RS232 . RS422 RS485

● **DTR/DSR**

DTR/DSR TCP
 . DTR (write-only)

DSR (read-only)

DTR

Always high

Always low

High when open

TCP

DSR

None

DSR 가

Allow TCP connection only by high

DSR 가

가

. DSR 가

, TCP가

TCP

UDP

DSR

, TCP

modem emulation

DSR

DSR

:
 DTR/DSR

● **(Inter-character)**

TCP/UDP

. STS

가

가

TCP/UDP

가 1024 bytes

1024bytes

TCP/UDP

'0'

STS

가

bps, 8, 1 (no parity), 10bit, 1200
 $10 \text{ (bits)} / 1200 \text{ (bits/s)} * 1000 \text{ (ms/s)} = 8.3 \text{ ms}$
 8.3ms, 0 (ms)

4.2.10.

STS, DCD, init-string, STS
 가 TCP

- /
 STS, DTR/DSR/DCD, STS, 가
- **init-string**
Modem init-string (initialization string)
 . *Enable/Disable modem* (Enabled)
 가 STS DTR 가
- **DCD**
 DCD, STS, 'TCP (Allow TCP connection only by HIGH)', DCD 가
 (dial-in modem mode) STS
 TCP
- Enable TCP STS
 Disable TCP
 STS

TCP

가 dial-out

dial out

DCD

None

Serial port configuration - 1 : Port #1 [--- Move to ---]

Enable/Disable this port

Port title

Apply all ports settings

Host mode configuration

Remote host configuration

Port IP filtering

Cryptography configuration

Filter application

Serial port parameters

Modem configuration

Enable/Disable modem : [Disable ▼]

Modem init-string : [q1e0s0=2]

DCD behavior : [NONE ▼]

Automatic release modem connection : [Disable ▼]

[Save to flash | Save & apply | Cancel]

Port logging

Port event handling

4-15

4.2.11. (Port Logging)

MEMORY, ATA/IDE

, SYSLOG

NFS

- / (Enable/disable)

(disabled)]

- Port log storage location

STS

, ATA/IDE

(PCMCIA

),

NFS

SYSLOG

STS

가

ATA/IDE ,

SYSLOG NFS 가

가 3200 Kbytes .(

3200 Kbytes .)

4 Kbytes
ATA/IDE

NFS 가 NFS 가

SYSLOG 가

Serial port configuration - 1 : Port #1 --- Move to --- ▾

Enable/Disable this port

Port title

Apply all ports settings

Host mode configuration

Remote host configuration

Port IP filtering

Cryptography configuration

Serial port parameters

Modem configuration

Port logging

Port logging : ▾

Port log storage location : ▾

Port log buffer size (KB, 200 max.) :

Port log :

Port event handling

4-16 Port logging configuration

4.2.12. Port event handling configurations

STS 가

email/SNMP (notification) 가

가

STS / TCP STS

(reaction) email

, SNMP ,

- 가 , (enable) (disable) STS

- **(Notification interval)**
 STS email SNMP 가
 email SNMP , email SNMP
 가 , STS ,
 가 가

- **Email (Email notification)**
 STS Email . STS Email
 SMTP SMTP . SMTP
 가 Email
 SMTP 3.4 SMTP .

- **Email**
 가 STS Email

- **Email**
 가

- **SNMP**
 STS SNMP

- **SNMP**
 가 STS SNMP

- **SNMP IP(SNMP trap receiver IP)**
 가 SNMP SNMP
 IP .

- **SNMP (SNMP trap version)**
가 SNMP

[]
• /

- **TCP /**
TCP

[]
• “ 가” “ ”

- **(Keyword string)**

- **Email**
가 Email

- **SNMP (SNMP trap notification)**
가 SNMP

- **Port**
가

- **Port (Port command string)**
STS 가

4.3.

가 , . All port configuration “apply all port setting” disable

“all port configuration” :

1. Port enable/disable
2. Port title
3. Host mode
4. Remote host configuration
5. Port IP filtering
6. Cryptography configuration (*Only valid and visible if host mode set to TCP or Modem Emulation mode*)
7. Serial port parameters
8. Modem configuration (*Only valid and visible if host mode set to TCP mode*)
9. Port logging
10. Port event handling

Serial port configuration - All ports : Port # --- Move to ---

Enable/Disable this port

Enable/Disable this port : Enable

Save to flash Save & apply Cancel

Port title

Host mode configuration

Remote host configuration

Port IP filtering

Cryptography configuration

Serial port parameters

Modem configuration

Port logging

Port event handling

4-18

- Port enable/disable

- **Port title**

가 , “ my server ”
 , #1 “ my server#1 ” #2 “ my
 server#2 ” .

- **Host mode**

가 TCP UDP , (listening)
 가 .

(listening port number + serial port number - 1)

“all port configuration” value set .

- **Remote host configuration, Port IP filtering, Cryptography configuration, Serial port parameters, Modem configuration, Port logging, Port event handling**

, “all port configuration” values set .

5. PC

STS PC 가 . 4가

- LAN
- LAN
-
- ATA/IDE fixed disk card

LAN LAN STS
 , ATA/IDE fixed disk card

(out-of-band)

STS

PC card configuration

Currently configured PC card

Card type : None

PC card service

5-1 PC

PC

1. PC PC
2. Select PC
3. STS (plug & play)

4. Save the configuration settings by selecting

5. **[Apply changes]**

STS 가 PC , 가



5-2

STS 가 PC B. PC

PC

Step 1. [(Ban- show the actual button) Stop card service]

Step 2. [Save to flash]

Step 3. [Apply changes]

Step 4. PC PC

: PC

5.1.

LAN PC STS 2 IP

PC card configuration

Currently configured PC card

Card type : Network Card
Model : Linksys EtherFast 10/100 Integrated PC Card (PCM100) Ver 1.0

Network configuration

IP mode : DHCP

IP address : 192.168.1.254

Subnet mask : 255.255.255.0

Default gateway : 192.168.1.1

Primary DNS : 168.126.63.1

Secondary DNS : 168.126.63.2

PPPoE user name : whoever

PPPoE password : *****

Confirm PPPoE password : *****

PC card service

Discover a new card Stop card service

Save to flash Save & apply Cancel

5-3 PC LAN

Delete

Format

. STS

EXT2 VFAT

STS

export

import

, STS

PC card configuration

Currently configured PC card

Card type :	ATA/IDE Fixed Disk Card
Model :	TOSHIBA THNCF064MBA
Size :	64 MB
File system :	ext2

ATA/IDE Fixed Disk Card configuration

Total data size to be used (0~64 MB) :	<input type="text" value="64"/>
Delete all files in ATA/IDE Fixed Disk Card :	<input type="button" value="Delete"/>
Format ATA/IDE Fixed Disk Card :	<input type="button" value="EXT2"/> <input type="button" value="Format"/>

PC card service

<input type="button" value="Discover a new card"/>	<input type="button" value="Stop card service"/>
--	--

5-6 PC ATA/IDE fixed disk card

6. System Administration

STS (Status Display Screen)

STS system logging
 email
 STS
 STS

6.1.

System status	
System information	
Model No. :	SS800 Device
Serial No. :	SS800-030799999
F/W Rev. :	v0.4.0
MAC address :	00-01-95-04-19-5a
Current time :	07/23/2003 13:40:42
System logging :	Enabled
Send system log by email :	Disabled
PC card type:	NONE
PC card model :	NONE
IP information	
IP mode :	STATIC
IP expiration :	N/A
IP address :	192.168.14.7
Subnetmask :	255.255.0.0
Gateway :	192.168.1.1
Receive/Transmit errors :	N/A
Primary DNS :	168.126.63.1
Secondary DNS :	168.126.63.2

6-1

6.2.

STS system logging
 system logging enable disable 가

- **System log storage location**

STS , PC ATA/IDE fixed disk card,
 NFS SYSLOG
 STS 가
 ATA/IDE fixed disk card, SYSLOG
 NFS
 가

- **System log buffer size**

300 Kbytes
 ATA/IDE fixed disk card
 NFS
 NFS
 SYSLOG
 가
 STS 가
 email
 email email
 6-2

System logging

System logging :

System log storage location :

System log buffer size (KB, 300 max.) :

Send system log by Email :

Number of log messages to send a mail (1-100) :

System log recipient's mail address :

System log :

```
07-23-2003 11:28:21 > Boot up System Start
07-23-2003 11:28:21 > Start with Static IP by 192.168.14.7
07-23-2003 11:28:21 > Start with PPPOE by 192.168.14.7
```

6-2

6.3.

Users logged on list

Username	Terminal	Login Date and Time	From
root	console	Jul 23 11:27	

6-3

Users logged on list

- User name()
- Terminal type for the session ()
- Time connected ()
- IP address of the remote host (IP)

:

. HTTP/HTTPS

6.4.

6-4

Change password

Current username :	admin
Enter current password :	<input type="password"/>
Enter new password :	<input type="password"/>
Confirm new password :	<input type="password"/>

Submit
Cancel

6-4

6.5. Device Name Configuration

STS

6-5

가 Device name

STS

hostname

CLI

hostname

```
root@STS800_Device:~#
```

Device name

Device name :	<input type="text" value="SS800_Device"/>
---------------	---

Save to flash
Save & apply
Cancel

6-5

STS

Device name

가 Device name

STS

hostname

STS

IP

Device name HelloDevice Manager

6.6. Date and Time Settings

STS . STS

6-6

가 . NTP , STS

NTP . NTP 0.0.0.0 ,

STS NTP STS

(UTC: Universal Time Coordinated) NTP

가 (timezone)

UTC 가 ,

, UTC ,

가 . STS

Date and time	
Use NTP :	Disabled ▾
NTP server (0.0.0.0 for Auto) :	192.168.200.100
Date [mm/dd/yyyy] :	01/09/2004
Time [hh:mm:ss] :	11:09:20
[Standard time]	
Timezone :	UTC
Time offset from UTC (UTC + [x.x]hours) :	0.0
[Daylight saving time]	
Enable/Disable daylight saving time :	Disabled ▾
Daylight saving timezone :	
Time offset from UTC (UTC + [x.x]hours) :	0.0
Start date [mm/dd] :	01/00
Start time [hh:mm:ss] :	00:00:00
End date [mm/dd] :	01/00
End time [hh:mm:ss] :	00:00:00

Save to flash Save & apply Cancel

6.7.

CF , NFS (user space)
(Export) , CF , NFS ,
(Import) .

(Import) "Factory default" STS

6-7 (Export)
(Import) .

(Configuration export)
(Location) : (Export) .
(Encrypt) : Yes No.
(File name)

(Configuration import)
(Location) : (Import) . **Factory default**

(Configuration selection) : (Import)

(Encrypt) : Yes No. (Import) 가 **Factory default**

(File selection) : CF , NFS ,
(Export)

(Local) : 가 (Export)

Configuration management

Configuration export

Location : CF Card NFS server User space(/usr2) Local machine

Encrypt :

File name : .syscm

Configuration import

Location : CF Card NFS server User space(/usr2) Local machine
 Factory default

Configuration selection :

Select all

System configuration (Including IP configuration)

Serial port configuration

Encrypt :

File selection : Local :

6-7

- (Export)
1. (Export)
 - 2.
 - 3.
 4. [Export]
- (Export) (Import)
1. (Import)
 2. (Import)
 - 3.
 4. (Import) 가 **Factory default**
 5. (Import) 가 (Import) (browse)
 6. [Import]

6.8.

가

<http://www.sena.com/support/downloads/> Sena

6-8

- 1.
- 2.
- 3.

Firmware upgrade

Select the new firmware binary file
This will take 5 minutes maximum

6-8

TELENT/SSH

Z

IP

- 1.
2. TELENT/SSH

(

, Telnet

SSH

.)

3. 6-9

4. 6-10

Z

5. 가

6. , STS

6-11

STS

Login : admin
Password : *****

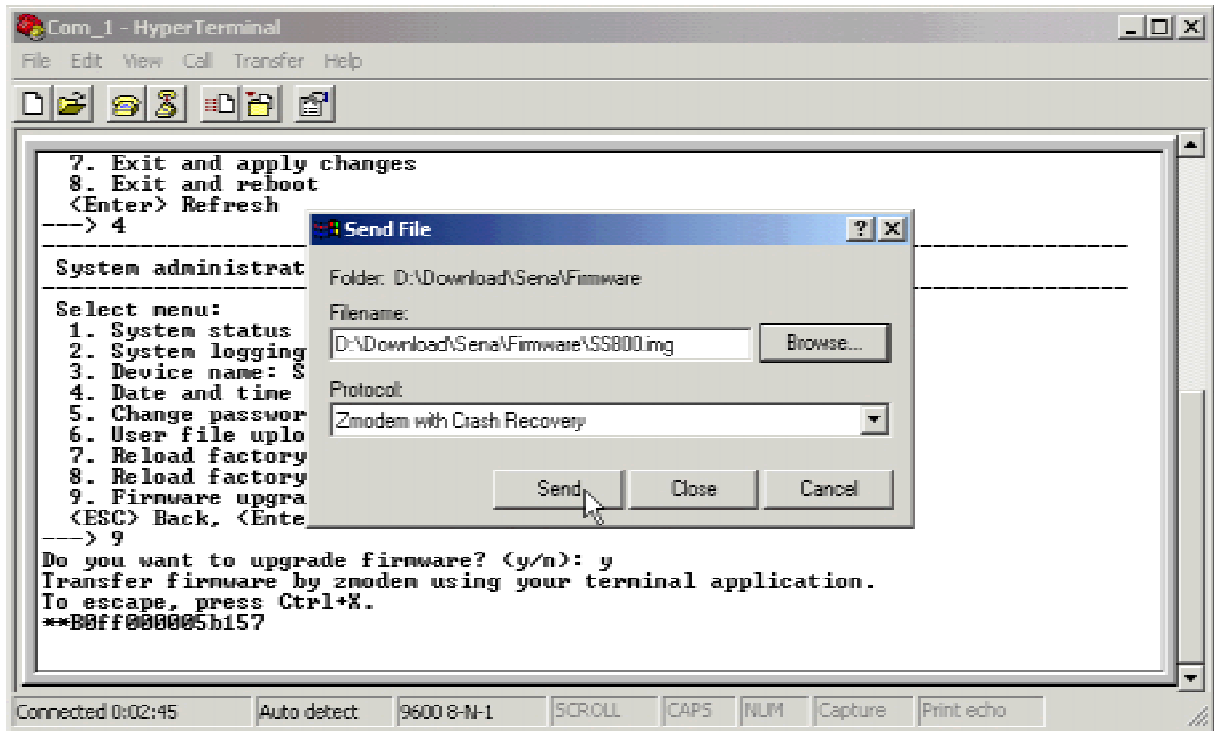
Welcome to STS-800 configuration page
Current time: 07/23/2003 15:04:07 F/W REV.: v1.0.0
Serial No.: STS800438349-42944 MAC address: 00-01-95-04-19-5a
IP mode: Static IP IP address: 192.168.14.7

Select menu:
1. Network configuration
2. Serial port configuration
3. PC Card configuration
4. System administration
5. Save changes
6. Exit without saving
7. Exit and apply changes
8. Exit and reboot
<Enter> Refresh
---> 4

System administration

Select menu:
1. System status
2. System logging
3. Device name: STS800 Device
4. Date and time
5. Change password
6. User file upload
7. Reload factory default settings
8. Reload factory default settings except IP settings
9. Firmware upgrade
<ESC> Back, <Enter> Refresh
--->9

Do you want to upgrade firmware? (y/n): y
Transfer firmware by zmodem using your terminal application.
To escape, press Ctrl+X
**B0ff000005b157



6-10 Z (HyperTerminal))

```

--->9
Do you want to upgrade firmware? (y/n): y
Transfer firmware by zmodem using your terminal application.
To escape, press Ctrl+X
**B0ff000005b157
**B0ff000005b157
**B0ff000005b157
**B0ff000005b157
Firmware upgrade failed !
Now reboot ...

```

6-11

6.9.

STS

6-12

“4.

System administration --> 6. User file upload”

가

STS

Z

TELNET/SSH

1.

2. TELNET/SSH

(, Telnet SSH .)

3. 6-12

4. 6-10 Z

5. 가 6-12

6. STS 6-13

(/usr2) . STS
, 8.2

```
-----
Welcome to STS-800 configuration page
Current time: 08/14/2003 11:56:13      F/W REV.   : v1.0.0
Serial No.   : STS800438349-42944      MAC address: 00-01-95-04-d3-03
IP mode     : DHCP                     IP address  : 192.168.222.206
-----

Select menu:
 1. Network configuration
 2. Serial port configuration
 3. PC Card configuration
 4. System administration
 5. Save changes
 6. Exit without saving
 7. Exit and apply changes
 8. Exit and reboot
<Enter> Refresh
---> 4
-----

System administration
-----

Select menu:
 1. System status
 2. System logging
 3. Device name: STS800 Device
 4. Date and time
 5. Change password
 6. User file upload
 7. Reload factory default settings
 8. Reload factory default settings except IP settings
 9. Firmware upgrade
<ESC> Back, <Enter> Refresh
---> 6
Do you want to upload a file to user space? (y/n): y
Enter a filename: test.txt
The file will be saved as /usr2/test.txt.
Transfer a file by zmodem using your terminal application.
To escape, press Ctrl+X.
**B01ff000005b157
Uploading a file is completed.
```

```
Do you want to upload a file to user space? (y/n): y
Enter a filename: test.txt
The file will be saved as /usr2/test.txt.
Transfer a file by zmodem using your terminal application.
To escape, press Ctrl+X.
**B01ff000005b157
Uploading a file failed.
```

6-13

7.

STS

STS

link layer, **lo**, **eth**

. IP, ICMP,

TCP

UDP

TCP/IP

4

7.1.

(Network Interfaces)

STS

local loop back interface

lo

STS

eth0

Network interfaces statistics			
Interface		lo	eth0
Receive	Bytes	680	7448861
	Packets	8	8057
	Errors	0	0
	Drop	0	0
	FIFO	0	0
	Frame	0	0
	Compressed	0	0
	Multicast	0	0
Transmit	Bytes	680	766794
	Packets	8	3991
	Errors	0	0
	Drop	0	0
	FIFO	0	0
	Frame	0	330
	Compressed	0	0
	Multicast	0	0

7-1

7.2.

32

, Baud rate

. (: On : Off)

OutRequests :

. Forwarding

OutDiscards :

OutNoRoutes :

destination IP

가

ReasmTimeout :

가

,

가

ReasmReqds :

ReasmOKs :

ReasmFails :

FragOKs :

fragmentation

FragFails :

fragmentation

FragCreates :

fragment

IP statistics	
Forwarding	2
DefaultTTL	64
InReceives	8208
InHdrErrors	0
InAddrErrors	0
ForwDatagrams	0
InUnknownProtos	0
InDiscard	0
InDelivers	4892
OutRequests	4973
OutDiscards	0
OutNoRoutes	0
ReasmTimeout	0
ReasmReqds	4954
ReasmOKs	1667
ReasmFails	0
FragOKs	21
FragFails	0
FragCreates	118

7-3 IP

7.4. ICMP

ICMP ICMP

InMsgs, OutMsgs :

InErrors, OutErrors :

InDestUnreachs, OutDestUnreachs :

InTimeExcds, OutTimeExcds :

time-to-live(TTL)

InParmProbs, OutParmProbs :

가

InSrcQuenchs, OutSrcQuenchs :

Quench

InRedirects, OutRedirects :

Redirection

InEchos, OutEchos :

echo

NEchoReps, OutEchoReps :

echo

InTimestamps, OutTimestamps :

time-stamp

InTimestampReps, OutTimestampReps :

time-stamp

InAddrMasks, OutAddrMasks :

InAddrMaskReps, OutAddrMaskReps :

ICMP statistics	
InMsgs	4
InErrors	0
InDestUnreachs	4
InTimeExcds	0
InParmProbs	0
InSrcQuenchs	0
InRedirects	0
InEchos	0
InEchoReps	0
InTimestamps	0
InTimestampReps	0
InAddrMasks	0
InAddrMaskReps	0
OutMsgs	4
OutErrors	0
OutDestUnreachs	4
OutTimeExcds	0
OutParmProbs	0
OutSrcQuenchs	0
OutRedirects	0
OutEchos	0
OutEchoReps	0
OutTimestamps	0
OutTimestampReps	0
OutAddrMasks	0
OutAddrMaskReps	0

7-4 ICMP

7.5. TCP

TCP TCP

RtoAlgorithm :

retransmission time-out (RTO)

가

0: CONSTANT - Constant Time-out

1: RSRE - MIL-STD-1778 B

2: VANJ - Van Jacobson's Algorithm

3: OTHER - Other

RtoMin :

RTO (ms).

RtoMax :

RTO (ms)

MaxConn :

ActiveOpens :

PassiveOpens :

AttemptFails :

EstabResets :

CurrEstab :

InSegs :

segment

OutSegs :

segment segment

RetransSegs :

RetransSegs :

OutRsts :

Reset 가

TCP statistics		
RtoAlgorithm		0
RtoMin		0
RtoMax		0
MaxConn		0
ActiveOpens		0
PassiveOpens		0
AttemptFails		0
EstabResets		0
CurrEstab		2
InSegs		1051
OutSegs		1486
RetransSegs		0
InErrs		0
OutRsts		5

7-5 TCP

7.6. UDP

UDP

UDP

InDatagrams :

NoPorts :

가

InErrors :

OutDatagrams :

UDP statistics		
InDatagrams		3859
NoPorts		4
InErrors		0
OutDatagrams		3863

7-6 UDP

8.3. Linux

8.3.1. Shell shell utilities:

sh, ash, bash, echo, env, false, grep, more, sed, which, pwd

8.3.2. File disk utils:

ls, cp, mv, rm, mkdir, rmdir, ln, mknod, chmod, touch, sync,
gunzip, gzip, zcat, tar, dd, df, du, find, cat, vi, tail,
mkdosfs, mke2fs, e2fsck, fsck, mount, umount, scp

8.3.3. :

date, free, hostname, sleep, stty, uname, reset,
insmod, rmmod, lsmod, modprobe,
kill, killall, ps, halt, shutdown, poweroff, reboot, telinit, init,
useradd, userdel, usermod, whoami, who, passwd, id, su, who

8.3.4. :

ifconfig, iptables, route, telnet, ftp, ssh, ping

8.4. root system admin CLI

- :
- 1) PC STS .
 - 2) PC .
 - 3) PC : 9600-8-N-1 No flow control
 - 4) <enter> .
 - 5) STS root admin .

Telnet :

- 1) telnet STS *_ip_address*

8.5.

8.5.1. telnet disable

STS , (SSH TCP 22 telnet TCP 23)
/Telnet/SSH STS
가 .
script rc.user , (telnet SSH)
가 . 2가 가

Example1. 'inetd.conf'

1 /etc/inetd.conf (telnet comment out)
2 inetd.conf /usr2/inetd.conf .
3 /usr2/rc.user script .

```
#!/bin/bash
#
# rc.user : Sample script file for running user programs at boot time
#
#PATH=/bin:/usr/bin:/sbin:/usr/sbin
# Add shell command to execute from here
# Add shell command to execute from here

cp -a /usr2/inetd.conf /etc/inetd.conf
ps -ef
while killall inetd 2>/dev/null;
do sleep 1;
ps -ef
done
/usr/sbin/inetd
ps -ef
exit 0
```

telnet 가 가

2. iptables rule

1 /usr2/rc.user script .

```
#!/bin/bash
#
# rc.user : Sample script file for running user programs at boot time
```

```

#
#!/bin/bash
#
# rc.user : Sample script file for running user programs at boot time
#
#PATH=/bin:/usr/bin:/sbin:/usr/sbin

# Add shell command to execute from here

# if user wants to disable telnet service from all host
iptables -A INPUT -p tcp -s --dport 23 -j DROP

# if user wants to enable telnet service only from specific hosts(192.168.0.0 ~
192.168.0.255)
#iptables -A INPUT -p tcp -s ! 192.168.0.1/255.255.255.0 --dport 23 -j DROP

exit 0

```

가 Factory Reset , STS , /usr2/rc.user
script /usr2/rc.user.old# rc.user

8.5.2.

crontab . crontab
가 .
1 /usr2 crontab . crontab /tmp
current-date 2 .

```

SHELL=/bin/bash
# Sample crontab job
# Run every two minutes
* * * * * echo `date` > /tmp/current_date

```

2 crontab .

```

root@STS800_Device:/usr2# crontab samplecrontab_file

```

3 cron
rc.user .

```

#!/bin/bash
#
# rc.user : Sample script file for running user programs at boot time
#
#PATH=/bin:/usr/bin:/sbin:/usr/sbin

```

```
# Add shell command to execute from here
crontab /usr/samplecrontab_file

exit 0
```

```
STS -e ( crontab )
      . vi crontab
      .
crontab crontab . (man 5
crontab).
```

1.

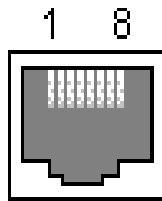
A 1.1 Ethernet Pin outs

STS

AT&T 258

Ethernet

A-1



A-1 RJ45

A-1. Ethernet RJ45

Pin	Function	
1	Tx+	
2	Tx-	
3	Rx+	
4	NC	
5	NC	
6	Rx-	
7	NC	
8	NC	

A 1.2

Pin out

STS

RJ45

RJ45

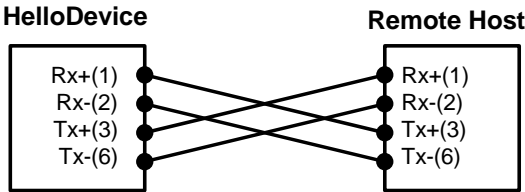
A-3

A-1

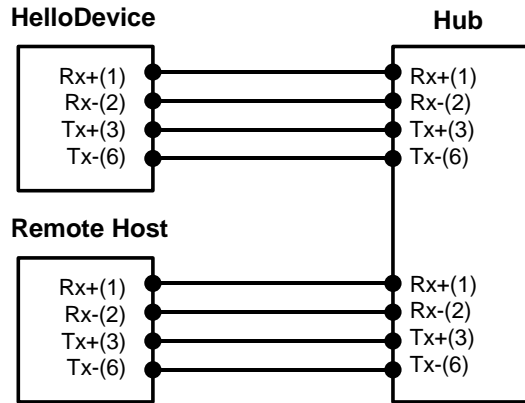
RJ45

Pin	RS232 (console and serial ports)
1	CTS
2	DSR
3	RxD
4	GND
5	DCD
6	TxD
7	DTR
8	RTS

A 1.3 Ethernet



A-2 Ethernet direct connection using crossover Ethernet cable



A-3 Ethernet connection using straight through Ethernet cable

A 1.4 RS232

RJ45-DB9 female adapter

Using RJ45 to DB9(Female) **Cross-over** Cable

Description (RJ45)	Internal Cable Color	RJ45 Pin No.	DB9 Pin No.	Description (DB9)
CTS	Blue	1	7	RTS
DSR	Orange	2	4	DTR
RXD	Black	3	3	TXD
GND	Red	4	5	GND
DCD	Green	5	1	DCD
TXD	Yellow	6	2	RXD
DTR	Brown	7	6	DSR
RTS	White	8	8	CTS

RJ45-DB25 female adapter

Using RJ45 to DB25(Female) **Cross-over** Cable

Description (RJ45)	Internal Cable Color	RJ45 Pin No.	DB25 Pin No.	Description (DB25)
CTS	Blue	1	4	RTS
DSR	Orange	2	20	DTR
RXD	Black	3	2	TXD
GND	Red	4	7	GND
DCD	Green	5	8	DCD
TXD	Yellow	6	3	RXD
DTR	Brown	7	6	DSR
RTS	White	8	5	CTS

RJ45-DB25 male adapter

Using RJ45 to DB25(Male) **Cross-over** Cable

Description (RJ45)	Internal Cable Color	RJ45 Pin No.	DB25 Pin No.	Description (DB25)
CTS	Blue	1	4	RTS
DSR	Orange	2	20	DTR
RXD	Black	3	2	TXD
GND	Red	4	7	GND
DCD	Green	5	8	DCD
TXD	Yellow	6	3	RXD
DTR	Brown	7	6	DSR
RTS	White	8	5	CTS

RJ45-DB25 male adapter

Using RJ45 to DB25(Male) **Straight** Cable

Description (RJ45)	Internal Cable Color	RJ45 Pin No.	DB25 Pin No.	Description (DB25)
CTS	Blue	1	5	CTS
DSR	Orange	2	6	DSR
RXD	Black	3	3	RXD
GND	Red	4	7	GND
DCD	Green	5	8	DCD
TXD	Yellow	6	2	TXD
DTR	Brown	7	20	DTR
RTS	White	8	4	RTS

2. STS 가 PC

STS

PC

A-2

Manufacturer	Model/Name	STS probed Model name	Specification
3COM	3CXE589ET-AP	3Com Megahertz 589E TP/BNC LAN PC Card	10 Mbps LAN card
Linksys	Linksys EtherFast 10/100 Integrated PC Card (PCM100)	Linksys EtherFast 10/100 Integrated PC Card (PCM100) Ver 1.0	10/100 Mbps LAN card
Corega	FetherII PCC-TXD	corega K.K. corega FEtherII PCC-TXD	10/100 Mbps LAN card
Netgear	16bit PCMCIA Notebook Adapter FA411	NETGEAR FA411 Fast Ethernet	10/100 Mbps LAN card

A-3

Manufacturer	Model/Name	STS probed Model name	Specification
Cisco Systems	AIR-PCM340/Aironet 340	Cisco Systems 340 Series Wireless LAN Adapter	11 Mbps Wireless LAN Adapter
Lucent Technologies	PC24E-H-FC/Orinoco Silver	Lucent Technologies WaveLAN/IEEE Version 01.01	11 Mbps Wireless LAN Adapter
Lucent Technologies	PC24E-H-FC/Orinoco Gold	Lucent Technologies WaveLAN/IEEE Version 01.01	11 Mbps Wireless LAN Adapter
Agere Systems (Lucent Technologies)	Orinoco Classic Gold (PC24E-H-FC/Orinoco Gold)	Lucent Technologies WaveLAN/IEEE Version 01.01	11 Mbps Wireless LAN Adapter
Buffalo	AirStation (WLI-PCM-L11GP)	MELCO WLI-PCM-L11 Version 01.01	11 Mbps Wireless LAN Adapter

A-4 ATA/IDE Fixed

Manufacturer	Model/Name	STS probed Model name	Specification
Advantech	CompactFlash	CF 48M	48 MB Storage card
SanDisk	SDP series	SunDisk SDP 5/3 0.6	64 MB Storage card
SanDisk	SDP series	SanDisk SDP 5/3 0.6	256 MB Storage card
Kingston	CompactFlash Storage Card	TOSHIBA THNCF064MAA	64 MB Storage card
Viking	CompactFlash	TOSHIBA THNCF064MBA	64 MB Storage card

Manufacturer	Model/Name	STS probed Model name	Specification
Billionton Systems Inc.	FM56C series	PCMCIA CARD 56KFaxModem FM56C-NFS 5.41	Ambient (Intel) V.90 FAX/MODEM PC Card
Viking	PC Card Modem 56K	Viking V.90 K56flex 021 A	MODEM PC Card
KINGMAX	KIT PCMCIA 56K Fax/Modem Card	CIRRUS LOGIC 56K MODEM CL-MD56XX 5.41	V.90 FAX/MODEM PC Card
TDK	TDK DH6400	TDK DH6400 1.0	64Kbps
NTT DoCoMo	Mobile Card Triplex N	NTT DoCoMo Mobile Card Triplex N	64Kbps

3. STS

A 3.1 System.cnf

```
#
# system.cnf
#
# system configuration which exist only one place on this file.
#

# kind of IP configuration mode
# 1 - static ip , 2 - dhcp , 3 - pppoe
ipmode = 1

# system ip address
ipaddr = 192.168.161.5

# system subnet mask
subnet = 255.255.0.0

# system gateway
gateway = 192.168.1.1

# dns configuration
# 'p_dns' is a primary dns ip address and 's_dns' is a secondary dns ip address
# if you want to set dns authmatically in case of dhcp or pppoe,
# you can set 'bmanual_dns' to 0.
p_dns = 168.126.63.1
s_dns = 168.126.63.2

# pppoe configuration
# 'ppp_usr' is pppoe account name and 'ppp_pwd" is a password for that account
ppp_usr = whoever
ppp_pwd = pppoepwd

# Email logging configuration
# if you want to send log via E-mail, set 'emaillog' to 1
# 'emaillog_num' trigger sending email.
# The number of logs are greater than 'emaillog_num", then send it.
emaillog = 0
emaillog_num = 5

# SMTP configuration
# 'smtpsvr' is a SMTP server .
# 'sysmailaddr' is a sender address.
# 'rcvmailaddr' is a receiver address.
# 'smtp_mode' means a SMTP server authentication mode.
# 1 - smtp w/o authentication , 2 - pop before smtp , 3 - smtp w/
authentication
# If 'smtp_mode" is 2 or 3, you need SMTP account information.
# 'smtp_user' is a SMTP account name and 'smtp_pwd" is a password.
bsmtp = 0
smtpsvr = smtp.yourcompany.com
sysmailaddr = STS800@yourcompany.com
rcvmailaddr = admin@yourcompany.com
smtp_mode = 1
smtp_user = admin
smtp_pwd = admin

# 'device_name' mean a unit name assigned. A unit name will be a identifier
among PS products.
device_name = STS800 Device

# IP filtering configuration
```

```

# By setting 'btelnet' to 1, you can use remote console.
# Similarly by setting 'bweb' to 1, you can use remote console.
# 0 means that protect any access.
# 'enable_ip', 'enable_netmask' pair is a source rule specification for remote
console filtering.
# 'enable_webip', 'enable_webnetmask' pair is for web filtering.
btelnet = 1
bweb = 1
enable_ip = 0.0.0.0
enable_netmask = 0.0.0.0
enable_webip = 0.0.0.0
enable_webnetmask = 0.0.0.0

# dynamic DNS(DDNS) configuration
# dynamic dns can be enabled by setting 'bdyndns' to 1. 0 for disable.
# 'dyn_dn' is a domain name for your DDNS.
# 'dyn_user' is a account name for DDNS and 'dyn_pwd' is a password for it.
bdyndns = 0
dyn_dn = ss800.dyndns.biz
dyn_user = ss800-user
dyn_pwd = ss800-pwd

# NTP configuration
# 'ntp_enable' set to 1 for using NTP or set to 0.
# 'ntp_serverip' is the IP address of NTP server and 'ntp_offset' is a your
offset from UTC.
# If you don't know any NTP server IP, then set 'ntp_auto_conf' to 1.
ntp_enable = 0
ntp_auto_conf = 1
ntp_offset = 0.0
ntp_serverip = 192.168.200.100

# Log configuration
# system logging is enabled by 'log_enable' to 1.
# 'logbuf_size' is a variable for representing log buffer size by KB.
# 'log_stoloc' is a location to save log.
# 1 = memory 2 = CF card 3 = NFS 4 = SYSLOGD
# If you choose log location to SYSLOGD, 'logbuf_size' you've set will loose his
role - limiting log file size.
log_enable = 1
logbuf_size = 4
log_stoloc = 1

# syslog configuration
# You can run or kill syslogd by setting 'bsyslog_service' to 1 or 0.
# 'syslog_ip' is a IP addresss of a remote syslog server.
# 'syslog_2ndip' is a IP address of a secondary syslogd server which will get
the same logs.
# 'syslog_facility' specify what type of program is logging. 0 ~ 7 for LOCAL0 to
LOCAL7
bsyslog_service = 0
syslog_ip = 192.168.200.100
syslog_facility = 0

# NFS configuration
# You can mount or unmount NFS by setting 'bnfs_service' to 1 or 0.
# 'nfs_ip' is a NFS server IP addresss and 'nfs_path' is a mount path.
bnfs_service = 0
nfs_ip = 192.168.200.100
nfs_path = /

# WEB configuration
# If you want to support HTTP, then set 'bweb_http' to 1. If not, set tot 0.
# 'bweb_https' is for HTTPS.
# 'web_refresh_rate' is for refresh the changing page when you see the system
status page.
bweb_http = 1

```

```

bweb_https = 1
web_refresh_rate = 10

# TCP configuration
# 'keepalive_time' is a time before keep alive takes place.
# 'keepalive_probes' is the number of allowed keep alive probes.
# 'keepalive_intvl' is a time interval between keep alive probes.
keepalive_time = 15
keepalive_probes = 3
keepalive_intvl = 5

# Ethernet configuration
# 'ethernet_mode' is a ethernet mode.
# 0 = Auto Negotiation, 1 = 100BaseT Half Duplex, 2 = 100BaseT Full Duplex,
# 3 = 10BaseT Half Duplex, 4 = 10BaseT Full Duplex
ethernet_mode = 0

# PCMCIA configuration
# 'pcmcia_card_type' shows a pcmcia card type.
# 0 for empty , -1 for unsupported card, 1 for CF card, 2 for Network card,
# 3 for Wireless Network card, 4 for Serial Modem card
pcmcia_card_type = 0

# PCMCIA ipconfiguration
# same with system ip configuration
pcmcia_ipmode = 2
pcmcia_ip = 192.168.1.254
pcmcia_subnet = 255.255.255.0
pcmcia_gateway = 192.168.1.1
pcmcia_ppp_usr = whoever
pcmcia_ppp_pwd = pppoepwd
pcmcia_bmanual_dns = 0

# In case of serial modem card, 'pcmcia_modem_initstr' means a modem init string.
pcmcia_modem_initstr = qle0s0=2

# Wireless network card configuration
# To enable or disable Wired Equivalent Privacy(WEP), set 'pcmcia_wep_enb' to 1
or 0.
# 'pcmcia_wep_mode' is a WEP mode. 1 for encrypted, 2 for shared
# 'pcmcia_wep_length' is a length for WEP. 1 for 40 bits, 2 for 128 bits
# 'pcmcia_wep_key_str' is a key string for WEP.
pcmcia_wep_enb = 0
pcmcia_wep_mode = 1
pcmcia_wep_length = 1

# 'pcmcia_cf_conf_max' is a maximum size to use in case of CF card.
pcmcia_cf_conf_max = 0

```

A 3.2 Redirect.cnf

```

#
# redirect.cnf
#
# Port configuration is placed on this file.
# Basically keys followed by 'port' key are data for those port.
# Port number is zero base index and the maximum value for port is used as all
port configuration
# Data followed by all port are default values and will NOT be applied.

# 'port' key notify the port data follow.
# If you want to activate the port, set 'benable' to 1. If not, set to 0.
# If you set 'bmanset' to 1, you don't want to change the port data by changing

```

```

all port configuration.
# If you want to change the port data by changing all port configuration, set to
0.
port = 0
benable = 0
bmanset = 0
port = 1
benable = 0
bmanset = 0
port = 2
benable = 0
bmanset = 0
port = 3
benable = 0
bmanset = 0
port = 4
benable = 0
bmanset = 0
port = 5
benable = 0
bmanset = 0
benable = 0
port = 6
bmanset = 0
benable = 0
port = 7
bmanset = 0
benable = 0

# As refered, maximum port (in case 8 port machine ,8) represents the
# defaults values for all port configuration.
port = 8
benable = 0
bmanset = 0

# Serial parameter configuration
# 'uarttype' is for UART type. But PS only support RS232.
# So set 'uarttype' to 0 and DO NOT CHANGE.
# 'baudrate' is for baudrate. From 1200 to 230400 is available.
# 'stopbits' is for stop bits. 1 for 1 bit, 2 for 2 bits
# 'databits' is for data bits. 7 for 7 bits, 8 for 8 bits.
# 'parity' is for parity. 0 for none, 1 for even , 2 for odd parity.
# 'flowcontrol" is for flow control. 0 for none, 1 for XON/XOFF,
#
# 2 for hardware flow control
# 'dtropt' is for DTR pin option.
# 1 = Always HIGH, 2 = Always LOW, 3 = High when open
# 'dsropt' is for DSR pin option.
# 0 = None, 1 = Allow TCP connection only by HIGH 2 = open/close TCP connection
# 'interchartimeout' is for inter-character timeout. It works ONLY FOR RAWTCP
# mode.
uarttype = 0
baudrate = 9600
stopbits = 1
databits = 8
parity = 0
flowcontrol = 0
dtropt = 0
dsropt = 0
interchartimeout = 100

# Host mode configuration
# 'hostmode' means a host mode.
# 0 = TCP mode, 1 = UDP mode, 2 = Mode emulation
hostmode = 0
# In TCP mode, 'localport' is a listening port.
localport = 0
# 'max_connection' is a maximum allowed number of remote host

```

```

max_connection = 32
# 'remotehost' is a remote host list
# (Primary IP address:port Secondary IP address:port)
remotehost = 192.168.0.135:7000 192.168.0.135:7001
# 'cyclicttime ' is a cyclic connection time in seconds
cyclicttime = 10
# 'inactivitytimeout' is a inactivity timeout in seconds.
inactivitytimeout = 100

# Cryptography Options
# 'encryptionmode' is encryption mode
# 0 = None, 1 = SSLv2, 2 = SSLv3, 3 = SSLV3 rollback v2, 4 = TLSv1
# 'encryptionkey' is encryption key file name
# 'key_password' is password for encryption key file
# 'cipher_suite' represents a combination of cipher suite.
# 'verify_client' is Verify client(server mode only) option
# 0 = No, 1 = Yes
# 'verify_chain_depth' is a number of chain depth to be searched
# 'verify_cn' is Compare the certificate CN and hostname option
# 0 = No, 1 = Yes
encryptionmode = 2
encryptionkey =
key_password = testing
cipher_suite = 524287
verify_client = 1
verify_chain_depth = 3
verify_cn = 1

# In UDP mode,
# 'accept_unlisted' is Accept UDP datagram from unlisted remote host option
# 0 = No, 1 = Yes
# 'send_to_unlisted' Send to recent unlisted remote host option
# 0 = No, 1 = Yes
accept_unlisted = 1
send_to_unlisted = 1

# IP filtering configuration
# 'allow_ip', 'allow_netmask' pair is a source rule specification for serial
port access filtering.
allow_ip = 0.0.0.0
allow_netmask = 0.0.0.0

# 'porttitle' is a port title.
porttitle = Port Title

# Mode configuration option
# 'modem_mode' is modem mode option
# 0 =Disable, 1 =Enable
# 'modem_initstr' is a modem initialization string
# 'modem_dcd_option' is modem DCD pin option
# 0 = None, 1 = Allow TCP connection only by HIGH
modem_mode = 0
modem_initstr =
modem_dcd_option = 0

# Event notification configuration
# Enable of disable Event notification by setting 'event_enable' to 1 or 0.
# 'notification_interval' is interval of event notification.
# 'bmail_handle' is a Enable/Disable E-mail notification option
# 0 = Disable, 1 = Enable
# 'mail_title' is a title of email notification.
# 'mail_address' is a mail recipient's address
# 'bsnmp_handle' is a Enable/Disable SNMP notification option
# 0 = Disable, 1 = Enable
# 'snmp_title' is a title of SNMP trap notification.
# 'snmp_trap_receiver_ip' is a IP address of SNMP Trap receiver

```

```
# 'snmp_trap_receiver_community' is community of SNMP Trap
# 'snmp_trap_receiver_version' is SNMP trap version
# 0 = v1, 1 = v2c
event_enable = 1
notification_interval = 0
bmail_handle = 1
mail_title = jungoj@sena.com
mail_address = jung@sss.com
bsnmp_handle = 1
snmp_title = khfgj
snmp_trap_receiver_ip = 192.168.0.8
snmp_trap_receiver_community = public
snmp_trap_receiver_version = 0

# Event Keyword option
# 'keyword_index' is a index of keyword event
# 'keyword_str' is a event keyword
# 'snmp_enable' is a SNMP notification option for keyword
# 0 = Disable, 1 = Enable
# 'mail_enable' is a email notification option for keyword
# 0 = Disable, 1 = Enable
# 'command_enable' is a port command option for keyword
# 0 = Disable, 1 = Enable
# 'port_command' is a port command string for keyword
keyword_index = 0
keyword_str = test
snmp_enable = 1
mail_enable = 1
command_enable = 1
port_command = fghfgh

# Port buffering configuration
# Enable of disable port buffering by setting 'pb_enable' to 1 or 0.
# 'pb_size' is a maximum port buffering size. Maximum value are different by
location.
# 'pb_loc' is a location to store port buffer data.
# 1 = memory 2 = CF card 3 = NFS 4 = SYSLOGD
pb_enable = 0
pb_size = 4
pb_loc = 1
```

4.

3가 (Well Known Port), (registered port), (Dynamic) (private port)
 0~1023 , 1024 49151
 49152 65535

IANA가 ,
 가 가 D-1
 IANA

<http://www.iana.org/assignments/port-numbers>

A-6 Well-known port numbers

Port number	Protocol	TCP/UDP
21	FTP (File Transfer Protocol)	TCP
22	SSH (Secure SHell)	TCP
23	Telnet	TCP
25	SMTP (Simple Mail Transfer Protocol)	TCP
37	Time	TCP, UDP
39	RLP (Resource Location Protocol)	UDP
49	TACACS, TACACS+	UDP
53	DNS	UDP
67	BOOTP server	UDP
68	BOOTP client	UDP
69	TFTP	UDP
70	Gopher	TCP
79	Finger	TCP
80	HTTP	TCP
110	POP3	TCP
119	NNTP (Network News Transfer Protocol)	TCP
161/162	SNMP	UDP
443	HTTPS	TCP

5. Guide to the Bootloader

A 5.1

Bootloader , BOOTP/TFTP STS
 . STS 3
가 <ESC> , bootloader .
 ,
firmware .

A 5.2

Bootloader 가 , .

```
Bootloader 1.1.0 (May 23 2003 - 22:48:25)
CPU      : XPC855xxZPnnD4 (50 MHz)
DRAM    : 64 MB
FLASH   : 8 MB
PC CARD : No card
EEPROM  : A Type exist
Ethernet : AUTO-NEGOTIATION
Autoboot Start: 0
-----
Welcome to Boot Loader Configuration page
-----
Select menu
1. RTC configuration [ Feb 14 2003 - 11:00:26 ]
2. Hardware test
3. Firmware upgrade [S/W Version : v1.0.0]
4. Exit and boot from flash
5. Exit and reboot
   <ESC> Back, <ENTER> Refresh
----->
```

A-4 Boot loader

A 5.3 RTC

RTC , STS .

```

RTC configuration
-----
Select menu
1. Date(mm/dd/yy) : 02/14/03
2. Time(hh:mm:ss) : 13:27:12
  <ESC> Back, <ENTER> Refresh
-----> 1
Enter Current Date (mm/dd/yy) : 02/15/03
press the ENTER key to continue

-----
RTC configuration
-----
Select menu
1. Date(mm/dd/yy) : 02/15/03
2. Time(hh:mm:ss) : 13:27:20
  <ESC> Back, <ENTER> Refresh
-----> 2
Enter Current Time (hh:mm:ss) : 13:25:00
press the ENTER key to continue

-----
RTC configuration
-----
Select menu
1. Date(mm/dd/yy) : 02/15/03
2. Time(hh:mm:ss) : 13:25:01
  <ESC> Back, <ENTER> Refresh
----->

```

A-5 Boot loader

RTC

A 5.4

```

      3가          가          .
- 1
- (                )
- (                )

가 1          ,          가          .
,          ( IP ) ping          UART          가          .
가 (                )          ,          가 <ctrl-c>
          가          .          ,          ( IP
) ping          UART          가
가 (                )          ,          가
<ctrl-c>          가          .          ,          ( IP
) ping          UART          가          .

```

```

:
Ethernet   UART           ,           STS           Ethernet
Ethernet           STS
           ,           IP           가           IP
           192.168.0.128           [Firmware Upgrade]

```

```
-----
Hardware Test
-----
```

```

Select menu
0. Test Mode - One time
1. Auto test
2. DRAM test
3. FLASH test
4. LED test
5. EEPROM test
6. UART test
7. PC card test
8. Ethernet test
<ESC> Back, <ENTER> Refresh
-----> 0

```

```
-----
Hardware Test
-----
```

```

Select menu
0. Test Mode - Looping(without External test in Auto test)
1. Auto test
2. DRAM test
3. FLASH test
4. LED test
5. EEPROM test
6. UART test
7. PC card test
8. Ethernet test
<ESC> Back, <ENTER> Refresh
----->0

```

```
-----
Hardware Test
-----
```

```

Select menu
0. Test Mode - Looping(with External test in Auto test)
1. Auto test
2. DRAM test
3. FLASH test
4. LED test
5. EEPROM test
6. UART test
7. PC card test
8. Ethernet test
<ESC> Back, <ENTER> Refresh
----->0

```

```
-----
Hardware Test
-----
```

```

Select menu
0. Test Mode - One time

```

```

1. Auto test
2. DRAM test
3. FLASH test
4. LED test
5. EEPROM test
6. UART test
7. PC card test
8. Ethernet test
<ESC> Back, <ENTER> Refresh
----->

```

A-6 Boot loader

가 [Auto test]

가

```

-----
Hardware Test
-----
Select menu
0. Test Mode - One time
1. Auto test
2. DRAM test
3. FLASH test
4. LED test
5. EEPROM test
6. UART test
7. PC card test
8. Ethernet test
<ESC> Back, <ENTER> Refresh
----->1

***** Hardware auto-detect and auto-test *****
[DRAM]
DRAM Test in progress -----[65536KB]
DRAM Test -----[SUCCESS]

[FLASH]
Flash Test Status-----[ 100 %]
Flash Test -----[SUCCESS]

[FAN]
Fan Status -----[7020 RPM]

[LED]
SERIAL READY LED ON/OFF-----3 time(s)

[EEPROM]
EEPROM : A Type exist
EEPROM Test ----- [SUCCESS]

[UART]
<--Internal loop test-->
Port # 1 test in progressing(Read/Write)-----[SUCCESS]
Port # 2 test in progressing(Read/Write)-----[SUCCESS]
.
.
Port # 7 test in progressing(Read/Write)-----[SUCCESS]
Port # 8 test in progressing(Read/Write)-----[SUCCESS]

<--External loop test-->
Port # 1 test in progressing(Read/Write)-----[SUCCESS]
(RTS/CTS)-----[SUCCESS]
(DTR/DSR)-----[SUCCESS]

```

```

Port # 2 test in progressing(Read/Write)-----[SUCCESS]
      (RTS/CTS)-----[SUCCESS]
      (DTR/DSR)-----[SUCCESS]
.
.
.
Port # 7 test in progressing(Read/Write)-----[SUCCESS]
      (RTS/CTS)-----[SUCCESS]
      (DTR/DSR)-----[SUCCESS]
Port # 8 test in progressing(Read/Write)-----[SUCCESS]
      (RTS/CTS)-----[SUCCESS]
      (DTR/DSR)-----[SUCCESS]

[PCMCIA]
5V CARD
5.0V card found: Lucent Technologies WaveLAN/IEEE Version 01.01
      Network Adapter Card

[Ethernet]
Ethernet chip test-----[SUCCESS]
PING 192.168.0.135 from 192.168.161.5 : 64 bytes of ethernet packet.
64 bytes from 192.168.0.135 : seq=0 ttl=255 timestamp=11172879 (ms)
64 bytes from 192.168.0.135 : seq=1 ttl=255 timestamp=11173874 (ms)
64 bytes from 192.168.0.135 : seq=2 ttl=255 timestamp=11174875 (ms)
64 bytes from 192.168.0.135 : seq=3 ttl=255 timestamp=11175876 (ms)

      ***** Hardware auto-detect and auto-test SUMMARY *****
1. DRAM Test -----[SUCCESS]
2. FLASH Test -----[SUCCESS]
3. FAN Test -----[SUCCESS]
4. EEPROM Test-----[SUCCESS]
5. UART Test Summary
   Port NO | exist status | exist status | exist status | exist status
-----
--
Port 01-04| YES SUCCESS | YES SUCCESS | YES SUCCESS | YES SUCCESS
Port 05-08| YES SUCCESS | YES SUCCESS | YES SUCCESS | YES SUCCESS

6.PC CARD Test Summary
5V CARD
5.0V card found: Lucent Technologies WaveLAN/IEEE Version 01.01
      Network Adapter Card
7. PING Test -----[SUCCESS]

PRESS any key to continue!!

```

A-7 Boot loader

<ESC>

```

-----
Hardware Test
-----
Select menu
0. Test Mode - One time
1. Auto test
2. DRAM test
3. FLASH test
4. LED test
5. EEPROM test
6. UART test
7. PC card test
8. Ethernet test
<ESC> Back, <ENTER> Refresh

```

```

-----> 1

***** Hardware auto-detect and auto-test *****
[DRAM]
DRAM Test in progress -----[ 640KB]
DRAM Test -----[SKIPPED]

[FLASH]
Flash Test Status-----[ 2 %]
FLASH Test -----[SKIPPED]

```

A-8 ESC

InUse LED 가 가 , 가
<ctrl-c> 가 .

A 5.5 Firmware upgrade

Firmware upgrade firmware .
firmware , 3
firmware . firmware upgrade firmware
 BOOTP TFTP 2 . DHCP
BOOTP 가 TFTP , IP
 IP 192.168.161.5. .
Firmware upgrade , [Server's IP address] [Firmware File Name]
firmware .

```

-----
Firmware upgrade
-----
Select menu
1. Protocol [BOOTP]
2. IP address assigned to Ethernet interface [192.168.161.5]
3. Server's IP address [192.168.0.128]
4. Firmware File Name [sts800.bin]
5. Start firmware upgrade
<ESC> Back, <ENTER> Refresh
-----> 1
Select protocol ( 1 = BOOTP, 2 = TFTP) : 2

-----
Firmware upgrade
-----
Select menu
1. Protocol [TFTP]
2. IP address assigned to Ethernet interface [192.168.161.5]
3. Server's IP address [192.168.0.128]
4. Firmware File Name [sts800.bin]

```



```
Select menu
1. Protocol [BOOTP]
2. IP address assigned to Ethernet interface [192.168.161.5]
3. Server's IP address [192.168.0.128]
4. Firmware File Name [sts800.bin]
5. Start firmware upgrade
   <ESC> Back, <ENTER> Refresh
----->
```

A-10 firmware upgrade

firmware upgrade

가

,

6. Serial/IP STS

A 6.1 STS Serial/IP

A-7 STS vs. Serial/IP

Serial Port Configuration of STS Series			Serial/IP Configuration		
Host mode Configuration		Cryptography Configuration	Credentials	Connection Protocol	Security
Host mode	Telnet Protocol	Encryption Method			
TCP	Disabled	None	No login required	Raw TCP connection	Disable
TCP	Enabled	None	No login required	Telnet	Disable
TCP	Disabled	“SSLv2” or “SSLv3 rollback to v2”	No login required	Raw TCP connection	Negotiate SSLv3/TSLv1
TCP	Disabled	“SSLv3” or “SSLv3 rollback to v2”	No login required	Raw TCP connection	SSLv3
TCP	Disabled	“TLSv1” or “SSLv3 rollback to v2”	No login required	Raw TCP connection	TSLv1
TCP	Enabled	“SSLv2” or “SSLv3 rollback to v2”	No login required	Telnet	Negotiate SSLv3/TSLv1
TCP	Enabled	“SSLv3” or “SSLv3 rollback to v2”	No login required	Telnet	SSLv3
TCP	Enabled	“TLSv1” or “SSLv3 rollback to v2”	No login required	Telnet	TSLv1

STS “SSLv3 rollback to v2” Serial/IP “Negotiate SSLv3/TSLv1”
 “SSLv3” STS 가 , Serial/IP “Negotiate SSLv3/TSLv1”

STS

A 6.2 - Telnet SSLv3 encryption

1. 1

Host mode = TCP,

TCP listening port = 7001,

Telnet protocol = Enabled

Serial port configuration - 1 : Port #1 --- Move to --- ▾

Enable/Disable this port

Port title

Apply all ports settings

Host mode configuration

Host mode :

TCP listening port (1024-65535, 0 for only outgoing connections) :

Telnet protocol :

Max. allowed connection (1-32) :

Cyclic connection to remote hosts (sec, 0 : disable) :

Inactivity disconnection timeout (sec, 0 : unlimited) :

Remote host configuration

Port IP filtering

Cryptography configuration

Filter application

Serial port parameters

Modem configuration

Port logging

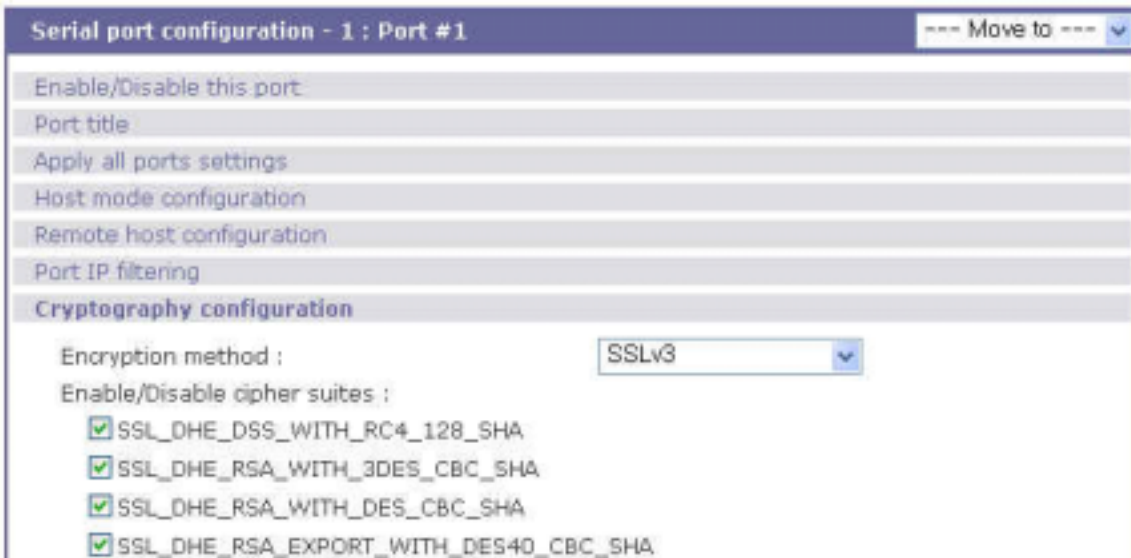
Port event handling

A-11

2. 1

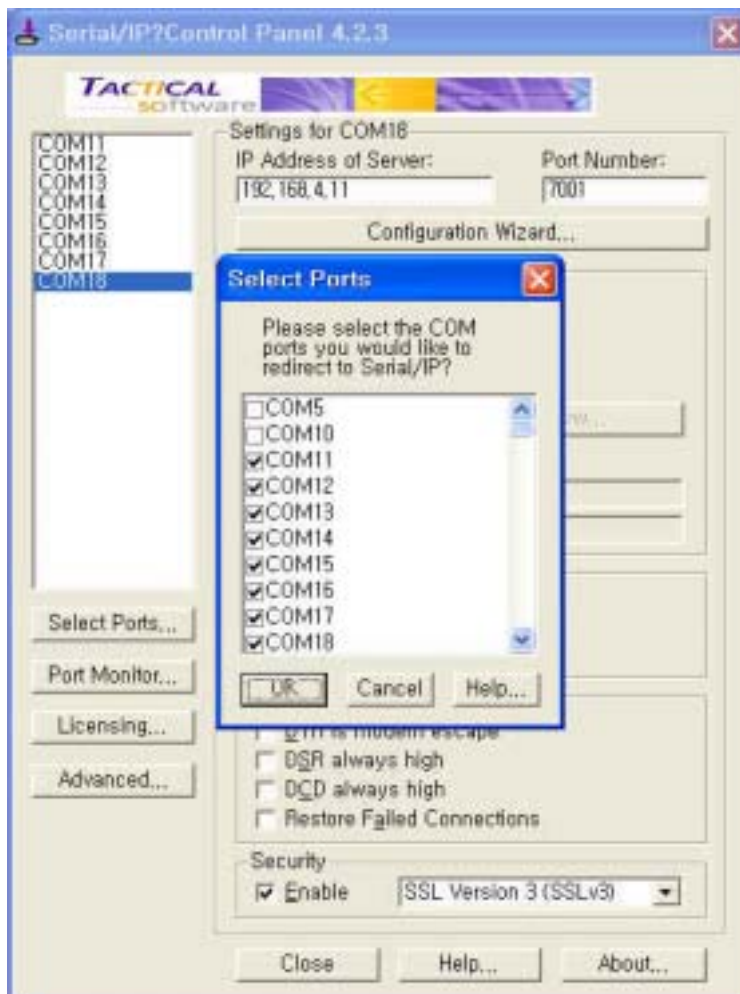
(Cryptography configuration)

Encryption method = SSLv3



A-12 (Cryptography configuration)

3. Open Serial/IP Control Panel , STS 1
COM "Select Ports"



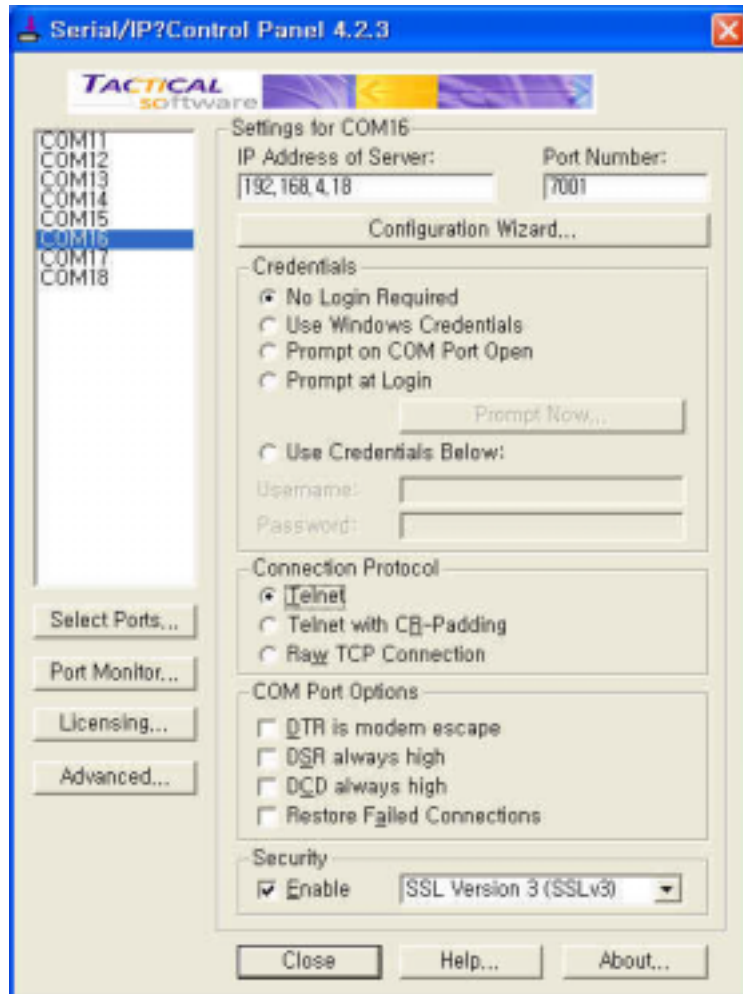
A-13 Serial/IP Control Panel

4. Enter IP (Super IP) (1)

Credentials = No Login Required,

Connection Protocol = Telnet,

Security = SSL Version 3 (SSLv3)



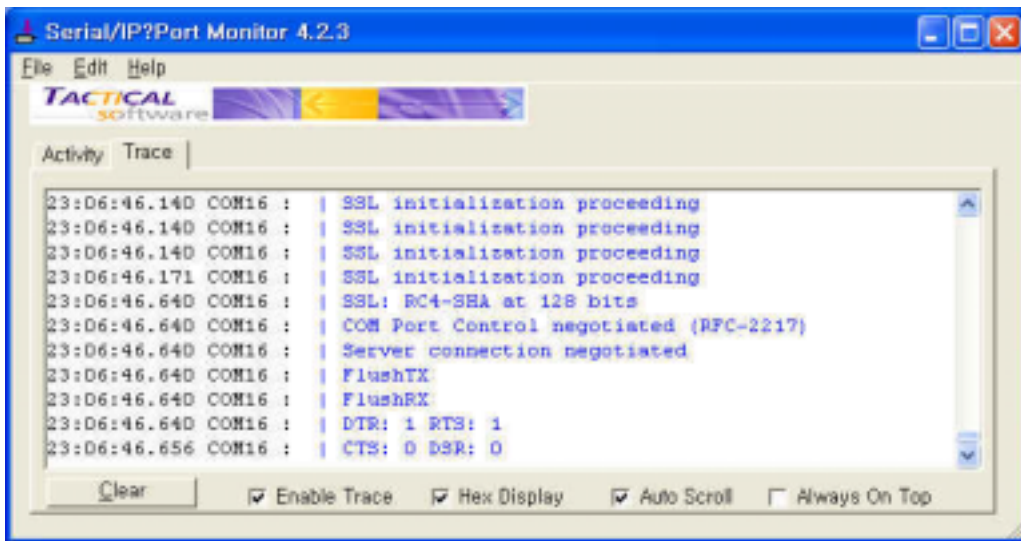
A-14 Serial/IP Control Panel

5. PC COM ,
STS



A-15 Serial/IP STS series

6. Serial/IP Serial/IP Port Monitor Trace window



A-16 Serial/IP Trace Window

7. SSL

A 7.1 OpenSSL

Step 1. Download the latest OpenSSL package. (<http://www.openssl.org>)

Step 2. Install the OpenSSL package.

<For Windows user>

Download OpenSSL for Windows binary file and run it.

(<http://www.slproweb.com/products/Win32OpenSSL.html>)

<For Linux user>

Download OpenSSL source code and compile it.

```
# cd /work/
# tar -xvzf openssl-0.9.7d.tar.gz
# cd openssl-0.9.7d
# ./config
# make
# make test
# make install
```

A 7.2 root CA (for Self-signed)

Step 1. Editing openssl configuration file.

Default configuration file location is as follows,

< Windows >

C:\Program Files\OpenSSL\bin

< Linux >

/usr/share/ssl/openssl.cnf

Modify [req_distinguished_name] section as follows,

```
countryName          = Country Name (2 letter code)
countryName_default  = KR
countryName_min      = 2
countryName_max      = 2

stateOrProvinceName  = State or Province Name (full name)
#stateOrProvinceName_default = Some-State

localityName          = Locality Name(eg, city)
localityName_default  = Seoul
```

```

0.organizationName      = Organization Name (eg, company)
0.organizationName_default = Sena Technologies Inc.

# we can do this but it is not needed normally :- )
#1.organizationName      = Second Organization Name (eg, company)
#1.organizationName_default = World Wide Web Pty Ltd

organizationalUnitName    = Organizational Unit Name (eg, section)
#organizationalUnitName_default =

commonName                = Common Name (eg, your name or your server\'s hostname)
commonName_default        = Sena Technologies
commonName_max            = 64

emailAddress              = Email Address
emailAddress_max          = 40

```

Modify [req_attributes] section as follows,

```

challengePassword_min =0
challengePassword_max =0

```

Step 2. Making self-signed Root CA(Certificate Authority)

< Windows >

```
# cd /work/openssl-0.9.7d/
```

< Linux >

```
# cd /work/openssl-0.9.7d/
```

```
# mkdir CA
```

```
# cd CA
```

```
# sh /usr/local/ssl/misc/CA.sh -newca
```

```

CA certificate filename (or enter to create)
  ;(Press Enter to use default value)
Making CA certificate ...
; openssl is called here as follow from CA.sh
; openssl req -new -x509 -keyout ./demoCA/private/./cakey.pem \
; -out ./demoCA/./cacert.pem -days 365
Using configuration from /usr/local/ssl/lib/ssl.cnf
Generating a 1024 bit RSA private key
.....+++++
.....+++++
writing new private key to './demoCA/private/./cakey.pem'
Enter PEM pass phrase:  ; CA Password (Enter password and remember this)
Verifying password - Enter PEM pass phrase:  ; CA Password
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
----- ; CA's Information
Country Name (2 letter code) [AU]: KR
State or Province Name (full name) [Some-State]:(Enter)
Locality Name (eg, city) []:Seoul
Organization Name (eg, company) [Internet Widgits Pty Ltd]: Sena Technologies
Organizational Unit Name (eg, section) []:(Enter)
Common Name (eg, YOUR name) []:Sena Technologies

```

```
Email Address []:(Enter)  
#
```

2-3. Check whether CA key file(demoCA/private/cakey.pem) and CA certificate (demoCA/cacert.pem) is generated

```
# ls demoCA/
```

```
cacert.pem certs  crl index.txt      newcerts  
private      serial
```

```
# ls demoCA/private
```

```
cakey.pem
```

A 7.3 (certificate request)

To make new certificates, you should make a certificate request first.

```
# cd /work/openssl-0.9.7c/CA
```

Run following commands,

```
# openssl genrsa -out key.pem 1024
```

```
# openssl req -new -key key.pem -out req.pem
```

(It is assumed that you are using sample configuration file

- "openssl.conf.sena")

```
Using configuration from /usr/share/ssl/openssl.cnf  
You are about to be asked to enter information that will be incorporated  
into your certificate request.  
What you are about to enter is what is called a Distinguished Name or a DN.  
There are quite a few fields but you can leave some blank  
For some fields there will be a default value,  
If you enter '.', the field will be left blank.  
-----  
Country Name (2 letter code) [US]: (Enter)  
State or Province Name (full name) [Minnesota]: (Enter)  
Locality Name (eg, city) [Minneapolis]: (Enter)  
Organization Name (eg, company) [Digi International]: (Enter)  
Organizational Unit Name (eg, section) []:(Enter)  
Common Name (eg, your name or your server's hostname) []:Sena VTS  
Email Address []:(Enter)  
  
Please enter the following 'extra' attributes  
to be sent with your certificate request  
A challenge password []:(Press Enter - Do not enter any other characters)  
An optional company name []:(Press Enter - Do not enter any other characters)
```

A 7.4 (certificate request)

4-1. Signing a certificate request


```
# cd /work/openssl-0.9.7c/CA
# cp req.pem newreq.pem
# sh /usr/local/ssl/misc/CA.sh -sign
```

```
Using configuration from /usr/share/ssl/openssl.cnf
Enter PEM pass phrase: CA Password (Enter CA password in step 2-2)
Check that the request matches the signature
Signature ok
The Subjects Distinguished Name is as follows
countryName      :PRINTABLE:'US'
stateOrProvinceName :PRINTABLE:'Minnesota'
localityName     :PRINTABLE:'Minneapolis'
organizationName :PRINTABLE:'Digi International'
commonName      :PRINTABLE:'Digi PortServer CM'
Certificate is to be certified until Oct  6 09:39:59 2013 GMT (3653 days)
Sign the certificate? [y/n]:y

1 out of 1 certificate requests certified, commit? [y/n]y
Write out database with 1 new entries
Data Base Updated
Certificate:
  Data:
    Version: 3 (0x2)
    Serial Number: 1 (0x1)
    Signature Algorithm: md5WithRSAEncryption
    Issuer: C=US, ST=Minnesota, L=Minneapolis, O=Digi International, CN=Digi International
    Validity
      Not Before: Oct  6 09:39:59 2013 GMT
      Not After : Oct  6 09:39:59 2013 GMT
    Subject: C=US, ST=Minnesota, L=Minneapolis, O=Digi International, CN=Digi PortServer CM
    Subject Public Key Info:
      Public Key Algorithm: rsaEncryption
      RSA Public Key: (1024 bit)
    ....
    -----BEGIN CERTIFICATE-----
    ....
    -----END CERTIFICATE-----
Signed certificate is in newcert.pem
```

4-2. Check whether signed certificate(newcert.pem) is generated.

```
# ls
```

```
demoCA      key.pem      newcert.pem  newreq.pem  req.pem
```

A 7.5 STS

5-1. Removing headings in newcert.pem file

```
# cd /work/openssl-0.9.7c/CA
# cp newcert.pem server.pem
# vi server.pem
```

```
Certificate:
```

```
Data:
  Version: 3 (0x2)
  Serial Number: 1 (0x1)
  Signature Algorithm: md5WithRSAEncryption
  Issuer: C=KR, ST=, L=Seoul, O=Sena Technologies Inc., CN= Sena
Technologies
  Validity
    Not Before: Oct  6 09:39:59 2003 GMT
    Not After : Oct  6 09:39:59 2013 GMT
  Subject: C=US, ST=Minnesota, L=Minneapolis, O=Digi International, CN=Digi
PortServer CM
  Subject Public Key Info:
    Public Key Algorithm: rsaEncryption
    RSA Public Key: (1024 bit)
....
== Removing above lines ==
-----BEGIN CERTIFICATE-----
....
-----END CERTIFICATE-----
```

5-2. Concatenating key.pem file to server.pem

```
# cat key.pem >> server.pem
```