Introduction to Linux-based solution for embedded software development Section 1 Eddy Real-Time Linux, Lemonix Section 2 Eddy Integrated Development Environment, LemonIDE Section 3 Eddy Utility Program

Introduction to Eddy Utility Program

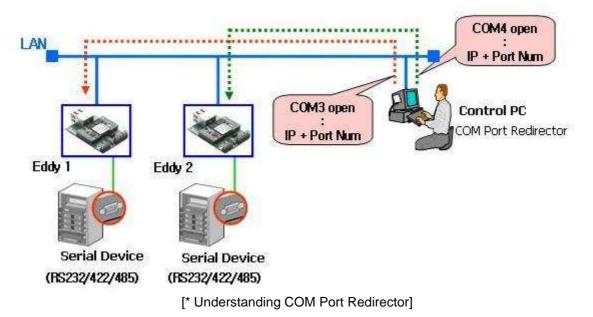
SystemBase's self-developed utility programs COM Port Redirector, PortView and TestView are designed for fluent performance of Portbase, Eddy and Wicomm. The COM Port Redirector which can COM-communicate by creating a virtual COM-Port on the controlled PC can still be used on former control programs controlled by COM-Port. PortView, designed for remote monitoring device products, can monitor components needed for function such as status information, serial port status and serial data's debugging. TestView, designed for testing each serial communication products, has wider range of testing communication with its ability to communicate in TCP/UDP Server-Client mode as well as COM communication. SNMP is also provided enabling an easy monitor and management of devices connected to a network.

Next will be special features of each program.

Virtual COM Port Program COM Port Redirector

1. Summary

COM Port Redirector is a network COM port driver and Redirector Control which operates it. It allows the device server's serial ports to be used as local COM ports of PC. Up to 255 COM ports can be registered on one PC using COM Port Redirector, allowing the serial ports connected to device server to be used as if they were COM ports connected on the user's PC.



Therefore, users can connect to Eddy on LAN just by opening COM port with COM Port Redirector on the controlling PC which makes remote control possible.

2. How to Use

Screen Components

COM9 COM10 COM11 COM12 C0M13 COM14 COM15 COM16 C0M17 COM18 COM19 COM20 C0M21 COM22 COM23 COM24 C0M25 COM26 COM30 COM31 COM32 C0M30 COM31 COM32 COM32 C0M33 COM34 COM35 COM36 C0M31 COM32 COM40 COM32 C0M33 COM34 COM35 COM40 C0M41 COM42 COM43 COM40 C0M45 COM42 COM40 COM40 C0M45 COM46 COM47 COM48 C0M45 COM46 COM55 COM56 C0M53 COM52 COM56 COM56 C0M51 COM56 COM60 COM56 C0M55 COM60 COM76 COM60 C0M65 COM66 COM71 COM60 C0M65 COM76 COM76 COM76 C0M	COM1	COM2	COM3	COM4	1
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COM93 COM94 COM95 COM96					
	COM85 COM89 COM93 COM97 COM97 COM101		COM87 COM91 COM95 COM99 COM99 COM103		
	COM105	COM106	COM107	COM108	N

COM Port Redirector is composed of Port Info, Monitor, Add Port and Delete Port.

[* COM Port Redirector Screen] Port Info : Port setting reference & modification Monitor : Port status reference Add Port : Port install

Delete Port : Port uninstall

2.1 Port Info

Referencing and modifying Redirector COM port settings are done on "Port Info" tab.

As shown below, Redirector COM ports are all displayed and each port's setting and status are shown.

🔊 Redirector Co							
Port Info Monitor	Add Port Delet	e Port					
COM Port	IP Addr	ess		Port	Protoco	l Act	
COM5 COM6 COM7 COM8 COM9 COM10	192,168 192,168 192,168 192,168 192,168	200,100 200,100 200,100 200,100 200,100 200,100 200,100		4001 4002 4003 4004 4005 4006	COM COM COM COM COM	Closed Closed Closed Closed Closed Closed	
COM10 COM11 COM12	192,168 192,168	200 100 200 100 200, 100 Protocol COM	.	4006 4007 4008 Apply Settings	COM COM COM	Clased Clased Clased	
	192, 168, 200, 100	Port 4002	<u> </u>	Force Port Close		Config Multiports	
Refresh							

Port Info Abilities

COM Port : Virtual COM port device name

IP Address : Eddy's IP address the virtual COM port is going to connect

Port : Eddy's port number the virtual COM port is going to connect

Protocol : Communication method with Eddy (COM/Encryption/Raw)

. COM : General virtual COM Port (default)

. Encryption : Coded communication with device server

(Uses Korean standard symmetric key way 128bit block coding algorithm SEED)

. Raw : General virtual COM mode sending only pure data

Act : Shows status of COM Ports (Closed/Open)

Apply Settings : Applies modified values.

Force Port Close : Used to force close opened ports when they do not close properly.

Config Multiports : Used to apply modified values to many ports on one time.

2.2 Reference to Port Status(Monitor)

Use "Monitor" tab to view current status of Redirector COM ports..

COM Port	IPAddr (Port)	Protocol	ACT	CON	ERR	TX	BX	RTS	CTS	DTR	DSR	DCD
COM17	192, 168, 0, 1 (4001)	COM	0	0	3	<u></u>	0	0	0	<u> </u>	9	0
COM18	192, 168, 0, 1 (4002)	COM	ā	ā	ā	ā	ā	ō.	ō.	ō.	ō.	ō.
COM19	192, 168, 0, 1 (4003)	COM	9	9	9	9	9	9	9	9	9	9
COM20	192, 168, 0, 1 (4004)	COM	9	9	9	9	9	9	9	9	9	9
COM21	192, 168, 0, 1 (4005)	COM	9	9	9	9	9	9	9	9	۵.	9
COM22	192, 168, 0, 1 (4006)	COM	9	9	9	۵.	۵.	9	9	۵	9	9
COM23	192, 168, 0, 1 (4007)	COM	9	9	9	9	9	9	9	9	9	9
COM24	192, 168, 0, 1 (4008)	COM	9	9	9	9	9	9	9	9	9	9

Each columns shows following information

ACT : Turns blue when application program is using the COM port.

CON : Turns blue when the COM port is connected to the device server.

ERR : Turns red when there is a connection problem with Eddy device.

Tx : Turns green when data is being transmitted

Rx : Turns yellow when data is being received.

RTS, DCD : Shows COM port status. Turns blue.

Refresh Button: When COM port number is modified by some other way other than through COM Port Redirector, or other serial port device is installed, clicking "Refresh" button or reactivating the tab will update COM Port Redirector.

2.3 Port Installation(Add Port)

COM1	COM2	COM3	COM4	1
COM5	COM2	COM3	COM8	
COM9	COM10	COM11	COM4 COM8 COM12 COM18	
COM13	COM14	COM15	COMID	
COM17	COM18	COM19	COM20	
COM21	COM22	COM23	COM24	
COM25	COM26	COM27	COM28	
COM29	COM30	COM31	COM32	
COM33	COM34	COM35	COM36	
COM37	COM38	COM39	COM40	
_ COM41	COM42	COM43	COM44	
COM45	COM46	COM47	COM48	
COM49	COM50	COM51	COM52	
COM53	COM54	COM55	COM56	
COM57	COM58	COM59		
_ COM61	COM62	COM63	COM64	
COM65	COM66	COM67	COM68	
	COM70	COM71	COM72	
	COM74	COM75	COM76	
COM77	COM78	COM79		
COM81	COM82	COM83	COM84	
_ COM85	COM86	COM87		
COM89	COM90	COM91	COM92	
	COM94	COM95	COM96	
	COM98	COM99	COM100	
COM101	COM102	COM103	COM104	
COM105	COM106	COM107	COM108	N

Adding Redirector COM port is done on "Add Port" tab.

Users can check and install desired COM port number for checkable numbers.

Numbers 1 through 255 are shown. To select other COM port numbers you can specify the starting COM port number in combo box in "Start COM".

Install Multiport button : Used to line up COM port numbers.

Multiport C	Configuration
Start Port	СОМ5 💌
Port Num	1 💌
IP Address	0.0.0.0
Port	4001
Protocol	СОМ 🗨
OK	Cancel

- Usable COM port numbers are listed in "Start Port". The number selected on "Port Num" is the amount of ports installed starting from the port number selected on "Start Port".

- COM port number increases by one, and if a number cannot be used, next number is used.

Example) Start Port = COM5, Port Num = 4 Selected.

COM6, COM8 unusable.

 \rightarrow COM5, COM7, COM9, COM10 installed.

2.3 Port Removal

Redirector COM port removal is done on "Delete Port" tab.

Currently installed Redirector COM ports are checkable.

COM1	COM2	🖂 СОМЗ	COM4	
COM1 COM5	COM2	COM3	COM4	
	COMID COMID	COM11	COMI2	
COMI3				
COM15	COM14	COM15		
COM21	COM22		COM24	
COM29	COM20	COM21		
COM23	COM30	COM35		
COM35	COM34	COM27 COM31 COM35 COM35 COM39	COM36	
COM37 COM41	COM38	COM39	COM40	
COM41	COM42	COM43		
COM49	COM40	COM47	COM52	
COM53	COM50	COM51	COM52	
COM55	COM50 COM54 COM58			
COM61	COM62			
COM65				
		COM67		
	COM70			
COM73 COM77	COM74			
	COM78			
		COM83		
2 COM85 COM89	COM78 COM82 COM86 COM90 COM90 COM94 COM98 COM98 COM102	COM87	COM80 COM84 COM88 COM92 COM96	
	COM90	COM91 COM95 COM99 COM99 COM103	COM92	
COM97	COM94	COM99		
COM101	COMISS COMISS	COM103	COM100	
COM101	COM102	COM107	COM104	~
COMINS	COMID6	COMID?	M COMIDO	-
tart COM COM1 💌	I	Uninstall Checked		Uninstall Multiports

256 ports are shown from COM1. To select other COM port numbers you can specify the starting COM port number in combo box in "Start Com".

Port is removed after checking the port you wish to remove and clicking "Uninstall Checked". Click "Uninstall Multiports" if you wish to remove all ports.

2.4 Using Ports

The installed virtual COM ports can be used with the same way as general serial ports.

They can be used with the same way as general serial ports on general console application programs such as hyper terminal, SecureCRT and users can program applications programs that use COM ports using Windows

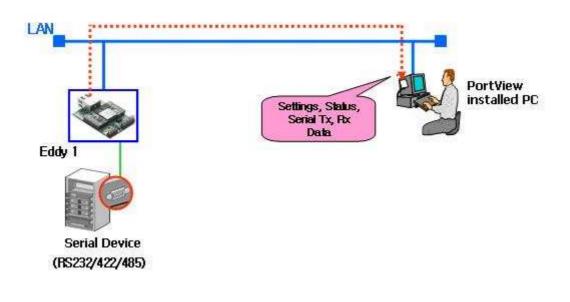
API.

COM Port Redirector must be running in order to use Redirector COM ports and COM port settings should be checked before they are used on application programs.

Eddy Serial Monitoring Program PortVew

1. Summary

PortView is a application program for Windows that can monitor device server's serial port status and function on remote PC.



[Understanding PortView]

PortView Primary Functions

Detector Ability (Eddy 의 MAC Search)

Real-time data monitoring Ability(Scope Ability)

Real-time device status reference ability(Config Ability)

Group setting and managing ability

Web, Telnet quick immediate connection ability

Therefore, PortView Ver2.0, unlike former versions, has many abilities such as Detector ability which searches Eddy's MAC on initial connection and quick connection to Web and Telnet.

2. How to Use

Screen Components

Detector Config Cascad	e) Tile Close All Help About	Main Windo	W P
> pb_group1 ∃	<pre> pb_group1/pb_sub1 Statistic Configuration Web Telnet Reboot </pre>		
indefine → undefine ● PB3080<0005F40065BD>	Name IP Address MAC Address Starting Time	Model	Version
	Eddy<0005F41 192.168.0.99 0005F4111111 2007-10-10 19:1	EDDY_S1_POE	2.00
	🧌 undefine/undefine		
	Statistic Configuration Web Telnet Reboot	2	
Group Window	Name IP Address MAC Address Starting Time	Model	Version
	PB3080<0005 192.168.0.242 0005F40065BD 2007-10-10 19:1	PB-3160	1.1c
		Device W	Vindow

PortView consists of 3 parts as shown below.

Main Window

Shown by red line. Manages PortView. Detector: Detects device servers in local network. Config: Configure Alarm, Log, Service Socket, Password. Cascade: Show Device Windows in PortView(Cascade) Tile: Show Device Windows in PortView. Close All: Close all Device Windows. Help: Opens folder containing PortView menu. About: Shows program version.

Group Window

Shown by blue line. Shows group, subgroup, device server and undefined.

Group: The upper part of folder tree on the picture. Groups can be created and deleted as users will.

Ex) "pb_group1": renamed.

Subgroup: Can be created inside group. Contains device list.

Device: Shown inside group. First appears on "undefined" subgroup and can be moved to another subgroup by left click and dragging..

Device Window

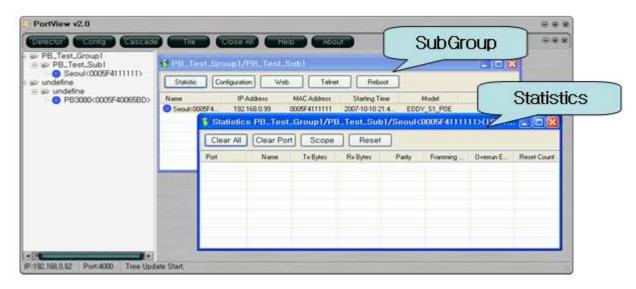
Shown by green line. Show device lists by subgroups. There are two shown on above picture. Names can be

changed except for "Undefined", devices can be moved from one subgroup to another with mouse dragging. It is where management on each device's information, status, data IO scope ability actually takes place and device monitoring, primary function of PortView, is done.

Device Window is divided into two groups.

SubGroup : "PB_Test_Group/PB_Test_Sub1" window in the picture below. Name is created by adding the group it belongs and the subgroup. Shows list of devices contained in the subgroup.

Statistics : Named as "Statistics GroupName/SubGroupName/DeviceName". Monitors device ports. Provides Tx/Rx, Scope ability.



2.1 Detector

Searches devices that can be managed by PortView contained in the Local Area Network. The detector searches Eddy's MAC Address.

PortView v2.	0				⊕ ⊕ 6	3
Detector	Config Ca	ascade) Tile	Close All	Help	About 🔵 🕀 😣	
Eddy<00 undefine	OSE4111111> Detector					8
IP:192,168,0,62	Search	P Configure)	elnet) (We	eb IP : 192.1	68.0.62	
11132,100,0,02					Gate way	••
	Eddy Eddy Eddy	00:05:F4:7A:10:15 00:05:F4:00:20:57 00:05:F4:11:11:11	192.168.0.240 192.168.0.247 192.168.0.99	255, 255, 255, 0 255, 255, 255, 0 255, 255, 255, 0	192,168,0,254 192,168,0,254 192,168,0,254	
•						•*

Search: Detects devices in the local area. .

IP Configure: Gives temporary IP to the selected device..

Telnet: Connects to the selected device using Telnet. Web: Connects to the selected device using Web.

2.2 Configuring Device Server Environment for Interaction with

PortView

For PortView to interact with Eddy, Eddy must be setup with the IP of the PC in which the PortView is ran on and default port(4000) used on the PortView. First connect to Eddy using Web and change settings as shown below.

Setup Menu			
Summary	General Configuration		
Network Settings	Device Name	Eddy	Heip
Serial Settings	Line Type	DHCP M Help	
Change Password	IP Address	192 168 8 99 Help	
Update Firmware	Subnet Mask	255 255 255 0 Help	
Factory Default Save & Reboot	••• Gateway	192 X68 0 264 Help	
	DNS	PortView	
Copyright 2007		installed PC's II	p 🗖
SystemBase Co., Ltd. All rights reserved.	Network Sevice Configurat	ion	
	Network Sevice Configurat	ion	Help
			Help
	PortView IP / Port	192168.0.62 / 4000	Port No.
	PortView IP / Port StrikePagent	192.168.0.62 / 4000 Drsame N + 1400	
	Portview IP / Port StateP Agent Teinet Service	192 168 0.62 / 4000 Dreame M Help Enable Help	

2.3 SubGroup Window

SubGroup window manages devices in the subgroup. When subgroup in the left window is selected by double clicking, the devices contained in the subgroup is shown in the device list window on the right Statistic: Shows statistics of the selected device.

Detector Config Cascade	e) Tile (C	lose All	Help Abou	ut		e
PB_Test_Group1	PB_Test_Gro	up1/P8_Tes	Sub1			
vundefine vundefine ⊷vundefine	Statistic Cor	nfiguration W	/eb Telnet	Reboot		
PB3080<0005F40065BD	Name	IP Address	MAC Address	Starting Time	Model	Version
	Seoul<0005F4	192.168.0.99	0005F4111111	2007-10-10 21:4	EDDY_S1_POE	2.00

Configuration: Shows configuration of the selected devices.

Web: Executes Web Config window of the selected device.

Telnet: Opens Telnet window to the selected device.

Reboot: Resets selected device.

2.3.1 Statistic

PortView v2.0									• •
Detector Config Cascad		Tile	Close All	Help	About				$\odot \odot \odot$
PB_Test_Group1 PB_Test_Sub1 PB_Test_Sub1 Undefine PB3060<0005F40065BD> CBd0y<0005F4111111>	6	1 second s	onfiguration		Telnet Eddy<0005F Reset	Reboot	(192.168.0.		
		Port OI		Tx Bytes 29184	Rx Bytes 29184	Parity D	Framming 0	Overrun E O	Reset Count
▲(meansurements) ► IP:192,168,0,62 Port:4000 Tree Upd	Jate St	art.							

Clear All: Clears numbers of all ports on statistics window such as Rx/TxByte

Clear Port: Clears numbers of selectd port on statistics window such as Rx/TxByte.

Scope: One scope can be executed per PortView. Provides scope ability to the DATA IO which runs independent of PortView.

Reset: Resets each port.

2.3.2 Configuration

Shows configuration information of selected device.

(Refresh)	Save)												
eden -PR-3 ft		· · ·											
	ersion=10.c	- 1 -											
ernel_Versi	on=1.0c												
irnware_Ver	sion=1.1c												
ine=IP													
P=192.168.0													
isk=255.255													
ateway=192. NS=168.126.													
M3=160.126. DNS=0.0.0.0													
TP=0.0.0.0													
	. 168.0.62/40	00 -											
ane=PB3080													
		1.1											
NMP=Disable ELNET_Serve	r-Enable												
NMP=Disable ELNET_Serve TP_Server=E	r-Enable nable												
NMP=Disable ELNET_Serve TP_Server=E EB_Server=E	r=Enable nable nable												
NMP=Disable ELNET_Serve TP_Server=E EB_Server=E SH_Server=E	r-Enable nable nable lisable												
NNP=Disable ELNET_Serve TP_Server=E EB_Server=E SH_Server=E	r-Enable nable nable lisable												
NHP=Disable ELNET_Serve IP_Server=E EB_Server=E SH_Server=E potTime=581	r-Enable nable inable lisable												
NNP=Disable ELNET_Serve IP_Server=E EB_Server=E SH_Server=E SH_Server=E DotTime=581	r-Enable nable nable lisable	Signal_Che	BaudRate	Data	Parity	Stop	Flow	Remote_IP	Segmentati	Keepaliv	Interface	Login	Login_Name
NNP=Disable ELNET_Server TP_Server=E EB_Server=E SH_Server=E ootTime=581 rotocol	r-Enable nable nable lisable		BaudRate 115200	Data 8	Parity None	Stop 1				Keepaliv 0	Interface RS232	Login Disable	Login_Name
NMP=Disable ELNET_Server EB_Server=E SH_Server=E sH_Server=E ootTime=581 rotocol CP_Server	r-Enable inable inable lisable Socket_No	Signal_Che					Flow	Remote_IP	Segmentati				
NHP=Disable ELNET_Server TP_Server=E EB_Server=E SH_Server=E lootTime=581	r-Enable mable mable lisable <u>Socket_No</u> 4001	Signal_Che Disable	115200	8	None	1	Flow None	Remote_IP 0.0.0.0/4000	Segmentati Disable	0	RS232	Disable	
NMP=Disable ELNET_Server=E EB_Server=E SH_Server=E ootTime=581 Crotocol CP_Server CP_Server	r-Enable mable mable lisable Socket_No 4001 4001	Signal_Che Disable Disable	115200 115200	8 8	None None	1	None None	Remote_IP 0.0.0.0/4000 0.0.0.0/4000	Segmentati Disable Disable	0	RS232 RS232	Disable Disable	
NMP=Disable ELNET_Server TP_Server=E EB_Server=E SH_Server=E ootTime=581 rotocol "CP_Server "CP_Server "CP_Server	r-Enable nable isable Socket_No 4001 4001	Signal_Che Disable Disable Disable	115200 115200 115200	8 8 8	None None None	1 1 1	Flow None None None	Remote_IP 0.0.0.0/4000 0.0.0.0/4000 0.0.0.0/4000	Segmentati Disable Disable Disable	0 0 0	RS232 RS232 RS232	Disable Disable Disable	
NMP=Disable ELNET_Server EB_Server=E SH_Server=E SH_Server=E toot Time=581 (CP_Server CP_Server (CP_Server (CP_Server) (CP_Server)	r-Enable inable isable isable 4001 4001 4001	Signal_Che Disable Disable Disable Disable	115200 115200 115200 115200	8 8 8 8	None None None None	1 1 1 1	Flow None None None None	Remote_IP 0.0.0.0/4000 0.0.0.0/4000 0.0.0.0/4000 0.0.0.0/4000	Segmentati Disable Disable Disable Disable	0 0 0 0	RS232 RS232 RS232 RS232	Disable Disable Disable Disable	
NNP-Disable ELNET_Server EB_Server=E SN_Server=E SN_Server=E ootTine=581 CP_Server CP_Server CP_Server CP_Server CP_Server	r-Enable inable isable Socket_No 4001 4001 4001 4001 4001	Signal_Che Disable Disable Disable Disable Disable	115200 115200 115200 115200 115200	8 8 8 8	None None None None None	1 1 1 1 1	Flow None None None None None None	Remote_IP 0.0.0.0/4000 0.0.0.0/4000 0.0.0.0/4000 0.0.0.0/4000 0.0.0.0/4000 0.0.0.0/4000	Segmentati Disable Disable Disable Disable Disable	0 0 0 0 0	RS232 RS232 RS232 RS232 RS232	Disable Disable Disable Disable Disable	- - - -

2.3.3 Scope Ability

Scope Ability monitors Data IO. Input/Output can be monitored in Hex/ASCII mode.

Select the port you wish to examine, click "Scope" and the scope window will appear.

PortView v2.0	$\odot \odot \odot$
Detector Contig Cascade Tile Close All Help About	$\odot \oplus \otimes$
PB_Test_Group1 PB_Test_Sub1 Undefine/undefine	
wundefine Statistic Configuration Web Telnet Reboot	
PB3060<0005F40065BD> Eddy<0005F411111> Statistics undefine/undefine/Eddy<0005F411111>(192,168,0,99)	3
Clear All Clear Port Scope Reset	
Port Name TxBytes RxBytes Parity Framming Overrun E Reset Cour 01 COM_R 559572 559515 0 0 0 0	it j
Start Hex Clear Capture Screen Open	
Тх	A
Bx	0
	
IP2192 Tx	
Bx .	
Tx	
Rx	
Tx	U
Rx	U
Tx Rx	
	U
Bx	
Tx	
Rx .	U

Start/Stop: Start or stop scoping.

Hex/ASCII: Selects data display type.

Clear: Clears printed values.

Capture: Captures printed values. Save after capture.

Screen: Selects background color and characteristic color.

Open: Opens captured & saved file.

[* Scoped Serial Port Data]

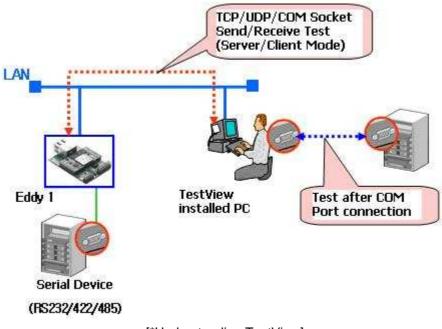
😭 Sco	pe Eddy<0005F4002057>/01	×
St	op Hex Clear Capture Screen Open	
Тх		
Bx	6C6D6E6F707172737475767778797A41424344454647480D0A6162636465666768696A6B6C6D6E6F7071727	П.
Tx		
Bx	96A6B6C6D6E6F707172737475767778797A4142434445464748494A0D0A6162636465666768696A6B6C6D6E	88
Tx		88
Rx	<u>636465666768696A6B6C6D6E6F70717273747576737475767778797A41424344450D0A616263646566676865</u>	88
Tx		88
Bx	2636465666768696A6B6C6D6E6F707172737475767778797A414243444546470D0A6162636465666768696AE	
Tx		
- Rx	<u>62636465666768696A6B6C6D6E6F707172737475767778797A4142434445464748490D0A616263646566676</u>	
Tx		88
Bx	94A0D0A6162636465666768696A6B6C6D6E6F707172737475767778797A4142434445464748494A4B0D0A61	
Tx		88
<u> </u>	434445464748494A4B4C0D0A6162636465666768696A6B6C6D6E6F707172737475767778797A41424344454	
Tx		
<u>Rx</u>	2737475767778797A4142434445464748494A4B4C4D4E0D0A6162636465666768696A6B6C6D6E6F70717275	
Tx		
Rx	6465666768696A6B6C6D6E6F707172737475767778797A4142434445464748494A4B4C4D4E4F500D0A6162E	Ŧ

TCP/UDP/COM Testing Program

TestView

1. Summary

TestView is an application program for Windows for testing serial and socket communication that can easily and accurately inspect serial communication devices such as multiports, embedded modules and device servers. Provides TCP,UDP server/client ability and can inspect all serial communication related devices regardless of their manufacturer through burning test and performance test.



[*Understanding TestView]

Primary Functions of TestView COM serial port open/test TCP/UDP port open/test

COM port burning test

TCP port burning test

Therefore, TestView is a communication test program that can examine actual COM port, virtual COM port, TCP connection port and UDP connection port with port open and data transmit/receive testing.

2. How to Use

Screen Components

5 81 T	estView	v V2.0		_ 🗆 🗙
<u>P</u> ort	<u>S</u> etting	<u>B</u> urning	<u>W</u> indows	<u>A</u> bout

[* TestView Screen]

2.1 COM Port

Run test on COM Ports. It can

Check receiving data on COM Port on a new window.

Check throughput.

Transmit test data through COM port.

Port Setting Burning Windows About	
All T. H. Hold Com Port	
Port Setting Burning Windows About	Com Region From COM7 Guantity BPorts V COM1 D Ports V
Port Setting Burning Windows About Com Port 0 Ports • ICP/UDP Port 0 Ports • Open 0 Ports • Save 0 Ports • Exit 0 Ports • File 0 Ports • File 0 Ports • CoM1 • 0 Ports • Open 0 Ports • Baudrate 9600 • Data Bits 8bits • Parity Bits None • Stop Bits 1 • Flow Control Flow Control	COM1 COM1

[* Opening a new window with "COM Port"]

Selecting initial COM port number and the number of ports will open ports. Also, specific options can be

assigned.

"COM Ports" window appears with 8 ports (COM7 ~ COM14) connected Buttons on top will affect all ports on "COM Ports" window.

Connect	Ports	1	tup	Clear	Ser	nd Dat	- X2	Stop D				Stop	Throughput		erminal			_ (3
Port	Status		Option			DTR					Send Bytes		Receive Bytes	•	Parity Error	Overrun Error	Framming	Transmit	T
COM7	Connect	9600/N/8/1	: Flow D	TRRTS	-	-		•				0	•	0	0	0	0		
COM8	Connect	9600/N/8/1	: Flow D	TRRTS				•				0		0	0	0	0	C	J
COM9	Connect	9600/N/8/1	Flow D	TRRTS			۲	۲	۲	۲		0		0	0	0	0	C)
COM10		9600/N/8/1					۲	۲	۲	۲		0		0	0	0	0	0	J
COM11		9600/N/8/1					•	٠	•	۲		0		0	0				
COM12		9600/N/8/1					•	•	•	۲		0		0	0			C	
COM13		9600/N/8/1					•	•	•	•		0		0	0			C	
COM14	Connect	9600/N/8/1	: Flow D	TRRTS						۲		0		0	0	0	0	0	J
↓																			

[* COM Port window opened]

- Connect : Opens all selected ports.
- Disconnect : Closes all selected ports connected.
- Setup : Modifies initial communication settings. (Single port only)
- Clear : Clears count values for all selected ports.
- Send Data : Sends data A~Z to all selected ports.

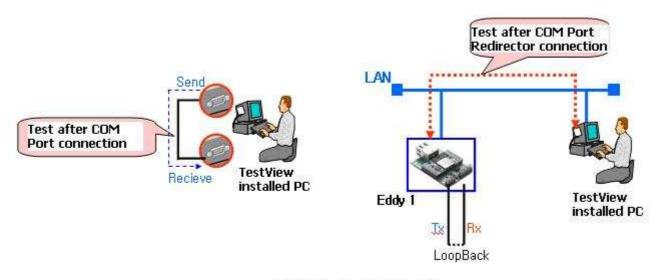
Start Throughput : Starts throughput for all selected ports.

Stop Throughput : Stops throughput for all selected ports.

Terminal : Runs emulator for all selected ports.

Open COM Port with Connect button as shown above.

2.1.1 Send Data/Stop Data





Transmit test data with current port.

Sending Data

Connect	1	mect Setup Clear	Ser	rd Dat	a	Stop D	Data	Star	······································	o Throughput T	erminal				×
Port	Status	Option	RTS	DTR	стร	DSR	DCD	RI	Sent Bytes	Receive Bytes	Parity Frror	Overrun Error	Framming Error	Transmit Chroughpu	R
COM7	Connect	9600/N/8/1: Flow RTSDTR			۲			۲	12,456	12,128	0	0	0	972	
COM8	Connect	9600/N/8/1: Flow RTSDTR				٠		۲	12,456	12,128	0	0	0	972	
COM9	Connect	9600/N/8/1: Flow RTSDTR						۲	12,456	12,128	0	0	0	972	
COM10	Connect	9600/N/8/1: Flow RTSDTR			۲		۲	۲	12,456	12,124	0	0	0	972	
COM11	Connect	9600/N/8/1: Flow RTSDTR			٠	٠		۲	12,456	12,128	0	0	0	972	
COM12	Connect	9600/N/8/1: Flow RTSDTR			•			۲	12,456	12,128	0	0	0	972	
COM13	Connect	9600/N/8/1: Flow RTSDTR			۲		۲	۲	12,456	12,120	0	0	0	972	
COM14	Connect	9600/N/8/1: Flow RTSDTR			۲		۲	۲	12,456	12,128	. 0	0	0	972	
•															1

Data sending stopped

Connec	t Discor	nnect Setup Clear	Ser	nd Dat	a	Stop (Data	Star	t Throughput Stop	Throughput T	erminal				
Port	Status	Option	RTS	DTR	CTS	DSR	DCD	RI	Send Bytes	Receive Bytes	Parity Error	Overrun Error	Framming Error	Transmit throughpu	
COM7	Connect	9600/N/8/1: Flow RTSDTR							13,218	13,154	0	0	0	961	
COM8	Connect	9600/N/8/1: Flow RTSDTR							13,218	13,154	0	0	0	961	
COM9	Connect	9600/N/8/1: Flow RTSDTR						۲	13,218	13,162	0	0	0	961	
COM10	Connect	9600/N/8/1: Flow RTSDTR			۲		۲	۲	13,218	13,162	0	0	0	961	
COM11	Connect	9600/N/8/1: Flow RTSDTR						۲	13,218	13,154	0	0	0	961	
COM12	Connect	9600/N/8/1: Flow RTSDTR						۲	13,218	13,162	0	0	0	961	
COM13	Connect	9600/N/8/1: Flow RTSDTR			۲	٠	۲	۲	13,218	13,162	0	0	0	961	
COM14	Connect	9600/N/8/1: Flow RTSDTR			۲		۲	۲	13,218	13,162	0	0	0	961	

Data transmit/receive can be checked with Terminal window.

	iew V2.0														_
СОМ.	11 (9600/	g <u>W</u> indows <u>A</u> bout N/8/1: Flow RTSDTR) <mark>-</mark> 🗖	×	≤ ■ C(DM12	(960	10/N/	8/1:	Flow RTSDTI	R) _ 🗆 🗙	🔊 🕰	M7 (960))/N/8/1:	Flow RTS	DTR) 💶
abcdefghij abcdefghij abcdefghij abcdefghij abcdefghij abcdefghij abcdefghij abcdefghij abcdefghij abcdefghij abcdefghij abcdefghij abcdefghij abcdefghij abcdefghij	iki ikimn ikimnop ikimnopq ikimnopq ikimnopqrst ikimnopqrst ikimnopqrst ikimnopqrst ikimnopqrst ikimnopqrst ikimnopqrst	J JYW JYWW JYWWXY JYWXYZ JYWXYZA JYWXYZA JY		abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet	ghijkln ghijkln ghijkln ghijkln ghijkln ghijkln ghijkln ghijkln ghijkln ghijkln	nno nnopq nnopq nnopqi nnopqi nnopqi nnopqi nnopqi	r rstu rstuv rstuvw rstuvw rstuvw rstuvw rstuvw rstuvw rstuvw rstuvw	i ix ixy ixyz ixyzA ixyzA ixyzA	a ac		abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg abcdefg	hijkl hijklmn hijklmno hijklmnopo hijklmnopo hijklmnopo hijklmnopo hijklmnopo hijklmnopo hijklmnopo hijklmnopo hijklmnopo	l rs irstu irstu irstuvw irstuvwxy irstuvwxy irstuvwxyz irstuvwxyz irstuvwxyz	A AB	
abcdefghij abcdefghij abcdefghij	kim kimn kimno	/8/1: Flow RTSDTR)		abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet abcdet	ghijkln ghijkln ghijkln ghijkln ghijkln ghijkln ghijkln ghijkln ghijkln ghijkln ghijkln	n nnop nnopq nnopq nnopq nnopq nnopq nnopq nnopq nnopq nnopq	r rst rstuv rstuvv rstuvv rstuvv rstuvv rstuvv	I IX IXY IXYZ IXYZ	Flow RTSDTI	R) _ 🗆 🗙	abcdefg abcdefg abcdefg	nijkl nijklm		A AB	SDTR) <mark>-</mark>
Com 🕬 Com	1	nnect Setup Clear	s	end Da	ata	Stop (Data	Sta	t Throughput	Stop Throu	ghput	Terminal]		_ [
Port	Status	Option	RTS	DTR	СТ5	DSR	DCD	RI	Send Bytes		eive /tes	Parity Error	Overrun Error	Framming Error	Transmit throughpu
COM7	Connect	9600/N/8/1: Flow RTSDTR			۲		۲	۲	258,7	50	258,330	0	0	0	960
COM8	Connect	9600/N/8/1: Flow RTSDTR						۲	258,7	50	258,346	0	0	0	960
	Connect	9600/N/8/1: Flow RTSDTR			0				258,7	50	258,354	0	0	0	960
COM9									258,7	en l	258,330	0	0	0	
	Connect	9600/N/8/1: Flow RTSDTR	_	_	-	-	-	•	200,1	30	200,000	U	0	U	960
COM9 COM10 COM11	Connect	9600/N/8/1: Flow RTSDTR 9600/N/8/1: Flow RTSDTR			ŏ	ŏ	ĕ	ŏ	258,7	50	258,330	0	0	0	960

It can observe data received from COM Port. It is aligned in "Tile" with black background color.

2.2 TCP/UDP Port

Used to test with TCP Server/Client, UDP protocol.

I TestView	V2.0			
Port Setting	<u>B</u> urning	<u>₩</u> indows	<u>A</u> bout	
<u>C</u> orn Port				
<u>TCP/UDP P</u>	ort			
<u>O</u> pen				
<u>S</u> ave				
<u>E</u> xit				

-TCP/UDP SE Connection T		IP Adress	Start Port	Quantity	
TCP Client	~	192.168.8.101	4001	8Ports 🔽	
None	~	0.0.0	4001	16Ports 🔽	
None	~	0.0.0	4001	16Ports 🔽	
None	~	0.0.0	4001	16Ports 🔽	

Specify Connection Type, UDP protocol, IP Address, Start, Quantity settings and click OK.

Connection Type has 4 options.

TCP Client : Can connect to remote TCP server. Set TCP server's IP and port to be connected.

TCP Server : User's PC becomes a TCP server and operates. IP is set to PC's IP.

UDP Client: Can connected to remote UDP server. Set UDP server's IP and port to be connected.

UDP Server : User's PC becomes a UDP server and operates. IP is set to PC's IP.

IP Address: Eddy's IP Address

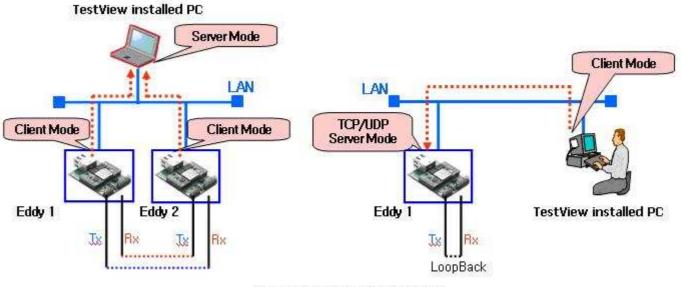
Start Port: Selects initial port number.

Quantity: Number of ports to be opened and tested.

After opening, testing procedure is same as testing in COM Port.

🔎 TCP/UDI	P Ports							
Connect/Li	isten Disconnect	Clear Send Data	Stop Data Start Thou	ghput Stop Though	put Terminal)		
Port	Status	Source	Destination	Send Bytes	Receive Bytes	Transmit throughput	Receive throughput	Running Time
Tcp_client	Connect	192.168.8.184:1151	192.168.8.120:4001	50,306	24,255	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1152	192.168.8.120:4002	50,306	24,255	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1153	192.168.8.120:4003	50,306	24,327	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1154	192.168.8.120:4004	50,306	24,255	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1155	192.168.8.120:4005	50,306	24,327	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1156	192.168.8.120:4006	50,306	24,255	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1157	192.168.8.120:4007	50,306	24,255	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1158	192.168.8.120:4008	50,306	24,327	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1159	192.168.8.120:4009	50,306	24,327	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1160	192.168.8.120:4010	50,306	24,255	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1161	192.168.8.120:4011	50,306	24,255	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1162	192.168.8.120:4012	50,306	24,255	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1163	192.168.8.120:4013	50,306	24,255	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1164	192.168.8.120:4014	50,306	24,255	1,077	981	00:00:3
Tcp_client	Connect	192.168.8.184:1165	192.168.8.120:4015	50,306	24,327	1,077	981	00:00:3

[* TCP Client Port Screen]



[TCP/UDP Port Test Methods]

2.3 Burning

Burning test is needed for testing long time transmit/receive that can specify test time, transmit/receive counter, transmit/receive data amount which makes it suitable for product's aging test.

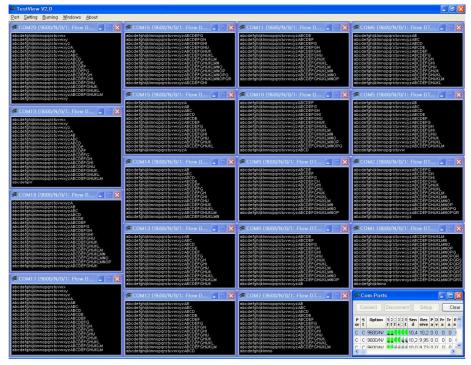
C Time	.	0 ^S	ettings	nute	Start	Stop		lear	Save	
@ Cour	nter	100		1	·····					1
Test		2048		Bytes		동	작 버튼			
••••••	Time	3000		mSec						
Ports	Test	Count	Tx-Rx Error	DTR-DSR Error	DTR-RI Error	RTS-CTS Error	RTS-DCD Error	Average	Status	1
COM3	-		0	0	0	0	0	0.00%	Wait	
COM4			0	0	0	0	0	0.00%	Wait	
COM5			0	0	0	0	0	0.00%	Wait	
COME			0	0	0	0	0	0.00%	Wait	
COM7			Ø	0	0	0	0	0.00%	Wait	
COMB			0	0	0	Q	0	0.00%	Wait	
COM9	1	Results	0	0	0	0	0	0.00%	Wait	
COM10		4:000000000	0	0	0	0	0	0.00%	Wait	
COM11			0	0	0	0	0	0.00%	Wait	
COM12			0	0	0	0	0	0.00%	Wait	
COM13			0	0	0	0	0	0.00%	Wait	
COM14			0	0	0	0	0	0.00%	Wait	
COM15			0	0	0	0	0	0.00%	Wait	
COM16			0	0	0	0	0	0.00%	Wait	
COM17			0	0	0	0	0	0.00%	Wait	
COMIR			0	n.,	0	0	0	0.00%	18/16	. 6

[*COM Port Burning example]

Number of errors can be counted during burning which allows users to measure product's performance.

2.3 Window Arrangement

Transmitted/received data in tested ports can be observed in numbers in TestView. Actual transmitted/received data can be observed through windows as well.



[* Windows Arranged in tiles]

15 (9600/I DM16 (960															X	
COM17 (X	
сом:														1		
🔛 💷 C (
	сом20 (X
	di Com	Ports													ſ	וחו
eb eb eb el	Conner	t Disco	nnect Setup Clear		nd Dat		top D	ato. IS	tart Thro	ughput Stop Thro	uahput Termi	24				
	Port	Status	Option	RTS		_			RI	Send	Receive	Parity	Overru	Framming	Transmit	Rece
	COM1				-			-		Bytes 37.530	Bytes	Error	n 0	Error	throughpu	throu
b eb eb el	COM1 COM2	Connect Connect							-	37,530 36,408	37,410 36,288	0	0		-	
81 81 81 81 81	COM5	Connect			-				ŏ	36,288	36,168	0	0			
6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	COM6	Connect			-					36,408	36,208	0	0			
6D 6D 61	COM7	Connect								36,408	36,232	0	0			
8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	COM8	Connect							ö	36,168	35,984	0	0	0	0	
60 60 60 60 60 60 60 60 60 60 60 60 60 6	COM9	Connect	9000/N/0/1: Flow DTRRT3							06,400	36,216	0	0	0	0	
	COM10	Connect	9600/N/8/1: Flow DTRRTS							36,288	36,168	0	0	0	0	
ab ab ab	COM11	Connect	9600/N/8/1: Flow DTRRTS						•	36,288	36,088	0	0			
ab ab ab ab ab ab ab ab ab ab ab ab ab ab ab	COM12	Connect							•	36,408	36,312	0	0			
D BD BD BD BD	COM13	Connect							•	36,048	35,856	0	0			
	COM14	Connect		-	-				•	36,048	35,856	0	0			
	COM15	Connect		-	-	-	-		•	35,928	35,808	0	0			
	COM16 COM17	Connect	9600/N/8/1: Flow DTRRTS 9600/N/8/1: Flow DTRRTS			-				36,288 36,168	36,104	0	0			
	COM18	Connect							ŏ	36,648	36,472	0	0			
	COM19	Connect							ŏ	35,928	35,808	0	0			
80 80 81 81	COM20								ā			0				
			9600/N&/1: Flow DTRRTS		2			Ö	Ö	36,048	35,928	0	0	0	0	

[* Windows arranged in cascaded form]

Network Management

SNMP

1. Overview

Simple Network Management Protocol (SNMP) forms part of the internet protocol suite and is used in network management systems to easily monitor and control network-attached devices. Before the advent of SNMP, ICMP (Internet Control Message Protocol) was chiefly used to check host's status on the network by sending/receiving simple error messages – indicating, for example, that a host cannot be reached or that requested service is not available using "Echo request/reply" messaging functions of ICMP.

But as networks grew, and as Internet became prevalent, simple ICMP no longer was adequate for efficient network management. SGMP(Simple Gateway Monitoring Protocol), HIMS, CMIP(Common Management Information Protocol)/CMIS(Common management information service) emerged as alternative to replace ICMP but eventually SNMP, an advanced form of SGMP rooted as industry standard.

Almost all popular operating systems such as Unix, Linux and Windows include SNMP and its related tools in their network package, and TCP/IP network devices such as a router also support SNMP as one of their basic features.

2. Usage

Followings are typical SNMP usages.

- * Network Architecture Management: Hierarchy architecture of hosts on the network can be retrieved.
- * Performance Management: Statistical data required for analyzing each network segment's performance (traffic rate, error rate, processing time, response time, etc) can be retrieved
- * Device Management: System information(CPU, memory, storage usage, etc) of each host on the network can be retrieved.
- * Security Management: Provides function to control and protect relayed information. SNMP3 saw a drastic improvement on security management.

MIB

SNMP is a protocol for network management and SNMP itself does not define the information the

managed hosted has to offer. This information is defined in MIB(Management Information Base) and it describes the structure of management data of a device subsystem. This predefined structured information; MIB includes information of the system, network usage and network interface.

MIB is defined and managed by IANA(Internet Assigned Number Authority) and takes on form of a treelike hierarchy for easy use and expansion. MIB can be amended usually by a device vendor to best reflect their product's characteristics. Such cases which expanded from IANA defined MIB is called expanded MIB.

MIB's versioned 1 & 2, notated as MIB-1 and MIB-2 is currently available. MIB-2 is an expanded version of MIB-1 and encompasses approximately 170 objects including all MIB-1's defined objects. Network objects are defined in forms of RFC. Eddy uses RFC-1212 and RFC1213 for network management and RFC-1659 for managing serial devices.

SNMP Manager/SNMP Agent

SNMP is a protocol and applications are required to collect network management data using SNMP. Generally, applications that utilize network protocols come in form of Server/Client model. This is also true for SNMP where terminology SNMP Manager/SNMP Agent is used rather than Server/Client.

A SNMP Agent is installed and runs on each managed system(network element or device) and reports the collected information via SNMP to information requesting managing systems (SNMP manager).

An SNMP Agent and SNMP Manager corresponds using three main tasks described below.

- * GET (reads managed system's status) : SNMP Manager(Management system) requests GET to SNMP Agent (managed system), and SNMP Agent reports or exposes managed system's status in form of variable to requesting SNMP manager.
- * **SET** (configures managed system) : SNMP Manager can send configuration updates or controlling requests to SNMP Agent using SET command.
- * TRAP (reports or alerts managed system's status without being asked by managing system) : SNMP Manager sends queries periodically to managed system using Polling method. When for some reason (usually due to network traffic) communication between SNMP Manager and Agent is delayed or is cut off, SNMP Manager will 'Retry' the non-responding SNMP agent. In such cases, there is a danger of Polling algorithm falling into an infinite loop and infinitely polling all managed systems listed in its polling list. To prevent such fallacy, SNMP agent may report its status using TRAP interrupt.

3. Using Eddy's SNMP

* Activating Eddy's SNMP

Eddy's SNMP encompasses RFC-1212, RFC-1213 and RFC-1659. RFC-1212 and RFC-1213 are standard MIB used for delivering network and system information and are supported by practically all network devices. RFC-1659 is standard MIB which various serial information, for example, communication line status and number of changing signal lines, are defined.

Besides the basic definitions on RFC-1659, environment setting information, usage and connection state of serial port, operating environment change, and reset function definitions have been added to Eddy's SNMP. A SNMP Manager can not only monitor and configure Eddy's operating environment status, but it can also modify operating settings in real time basis.

Eddy's SNMP Agent setting webpage and its setting values and explanation are shown below.

ddy ^m means real-time		Device Name: Eddy Logged in as test Loggett		
Menu				
Summary	SNMP Agnet Configuration			
Network Settings	SNMP v1/v2/v3 Agent	Enable V Help		
Serial Settings	V1/2 Attribution	ReadOnly Y Help		
GPIO Settings SNMP Settings	V3 Attribution	ReadOnly Y Help		
or the octange	V3 Username / Password	eddy / none Hclp		
Change Password	TRAP IP / Port	0.0.0.0 / 162 Help		
Update Firmware Factory Default	System reset notification	Enable Y Help		
Save & Reboot	Port connect notification	Disable Y Help		
	Port disconnect notification	Disable V Help		
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		Submit Cancel		

SNMP v1/v2/v3 Agent	Enable/Disables SNMP Agent					
V1/2 Attribution	When using SNMP V1 and V2, sets read or write attribute of SNMP Agent. ReadOnly – SNMP agent can read only					
V 1/2 Attribution	ReadWrite SNMP agent can read and write					
	When using SNMP V3, sets read or write attribute of SNMP Agent.					
V3 Attribution	ReadOnly – SNMP agent can read only					
	ReadWrite SNMP agent can read and write.					
V3 Username/	me/ When using SNMP V3,					
Password	ord Sets Username and Password.					
TRAP IP/ Port	Sets IP address and port number of the server that receives TRAP data.					
System reset notification	When system resets, set to notify or not					
Port connect notification	When connecting to a serial port, set to notify or not.					
Port disconnect notification	When disconnecting to a serial port, set to notify or not.					

* Setting MIB and using SNMP function on SNMP Manager.

The picture below shows an example of SNMP manager setup. Eddy has been selected as SNMP Agent, and MIBs have been registered. SNMP Manager program requested a GET to SNMP Agent, Eddy and Eddy reports the requested information to SNMP Manager. Below picture also depicts data scoping being processed due to a TRAP interrupt from SNMP Agent, Eddy.

[* Reference: MIB Browser Version 6.0 by iReasoning was used as SNMP manager program]

