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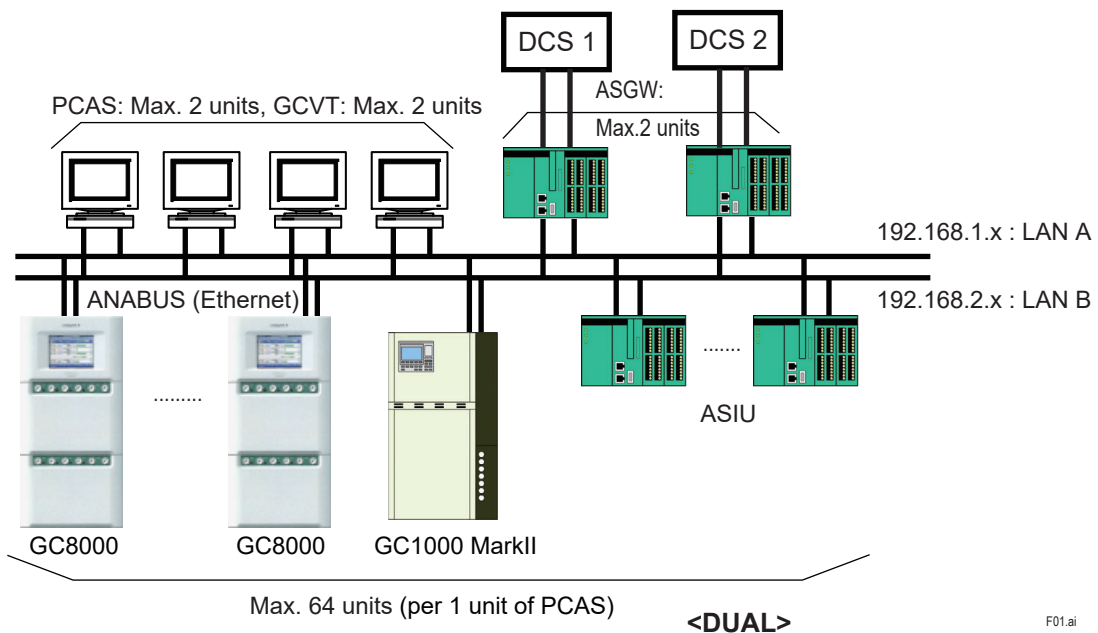
# 1. Summary

## 1.1. Introduction

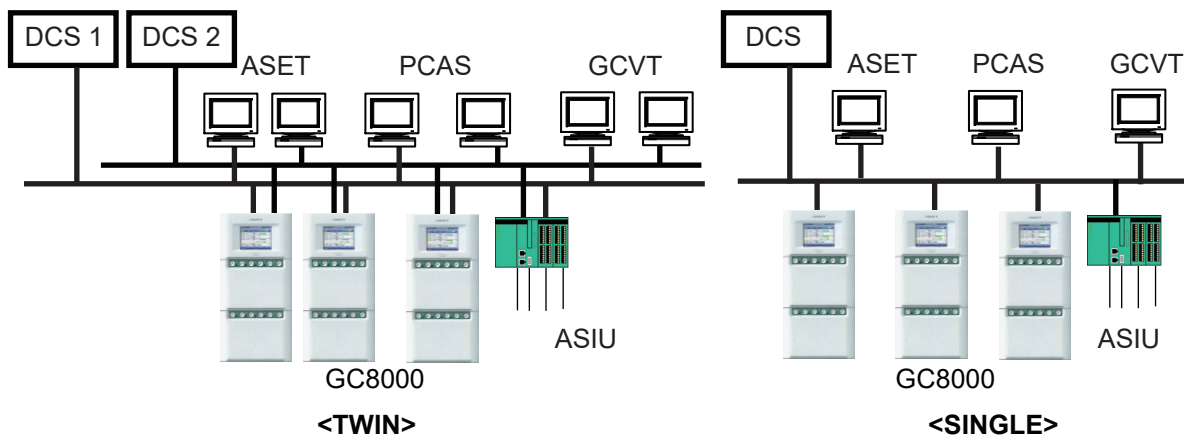
The advantage to apply the redundant network for ANABUS Ethernet is to avoid any effect to the application by changing over the communication line quickly and automatically in case there is any defect in a communication line between nodes.

## 1.2. ANABUS Ethernet Redundant network configuration

The equipment (hardware/software) which supports Redundant system is the GC8000, GC1000 MarkII, PCAS, GCVT, ASGW and ASIU, and up to 75 units can be connected. ASET and Ether-LCD do not support Redundant system.

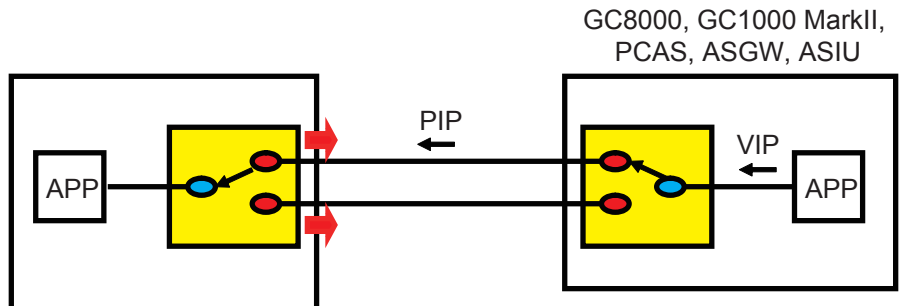


Note: In redundant network (Dual) described in the above figure, ASGW between DCS and GC8000 are mandatory. Also it is recommended to set ASGW near DCS. In other network configurations (Twin, Single), the configuration without ASGW is also possible.



## 1.3 Diagnostic packet

Each node which make up the redundancy has 2 pieces of Network Interface Card(NIC) and send a diagnostic packet, which checks if the communication is alive, to both communication lines periodically. When the destination node fails to receive the diagnostic packet 2 times in series, then it changes over the communication routing.



<IP address rule>

VIP = 192.168.3n.XXX

PIP-A = 192.168.3n+1.XXX

PIP-B = 192.168.3n+2.XXX

PIP-A: Physical IP address for LAN A

PIP-B: Physical IP address for LAN B

XXX should set the Analyzer ID

- : PIP (Physical IP address)
- : VIP (Virtual IP address)
- : IP routing (redundancy function)
- ➔ : Diagnostic packet

F02.ai

The time to be changed over the communication routing depends on the setting value of the interval to send the diagnostic packet. When the default value which is 500 msec is set, the time to be changed over is 1000 to 1500 msec.

**Table 1 Guideline of No. of node vs. Diagnostic interval (When Stardom(FCJ) is used)**

No. of Node	Diagnostic interval (msec)	Description
Up to 12	500	Default
13 to 25	1,000	
26 to 50	1,500	
51 to 62	2,000	
63 to 75	3,000	

Note: On Windows 10 (64-bit version), it may take around 60 seconds for the automatic communication recovery after detecting a network failure event. Analyzer data will not be saved to PCAS during the transition period.

## 1.4 Recommended IP address

It is recommended to set the following Virtual IP address (VIP) to the equipment (hardware/software) when connecting to Redundant system.

Equipment	VIP
PCAS, GCVT	192.168.0.121 to 192.168.0.126
GC8000/GC1000 MarkII	192.168.0.1 to 192.168.0.64
ASGW/ASIU	192.168.0.101 to 192.168.0.120
GC-HMI/ Wireless LAN UNIT	192.168.1.129 to 192.168.1.192
ASET/EtherLCD	192.168.1.201 to 192.168.1.254

Note: The following equipments do not support the redundant system.

GC-HMI, ASET, EtherLCD, Wireless LAN UNIT

**Table 2 Assignment of IP address**

For example	VIP	PIP-A	PIP-B
PCAS, GCVT	192.168.0.126	192.168.1.126	192.168.2.126
GC8000, GC1000 MarkII	192.168.0.1	192.168.1.1	192.168.2.1
ASGW	192.168.0.111	192.168.1.111	192.168.2.111
ASIU	192.168.0.101	192.168.1.101	192.168.2.101

Note: Use a private address of Class C (\*1) as IP address.

Note: IP address is set in the range of 192.168.x.1 to 192.168.x.254.

(x : triple number in the range of 0 to 252.)

Note: Subnet mask is fixed as 255.255.255.0.

\*1:

Class	IP address (blank : 0 to 255)	No. of Address
Class A	1 to 127	16,777,216
Class B	128 to 191	65,536
Class C	192 to 223 *2	256

\*2 For instance, when "192" of the head number of network address is assigned, it belongs to Class C and the host address is determined by the range of the foot number set. 256 pcs of IP address can be set in this case.

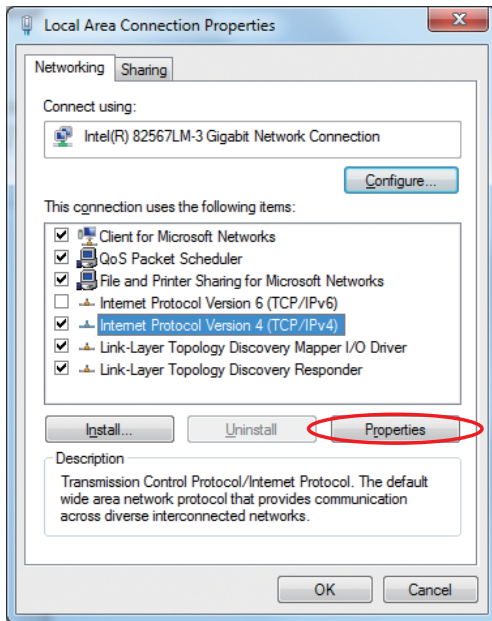
## 2. PCAS, GCVT

### 2.1 Network setting on Windows

[Prior condition]

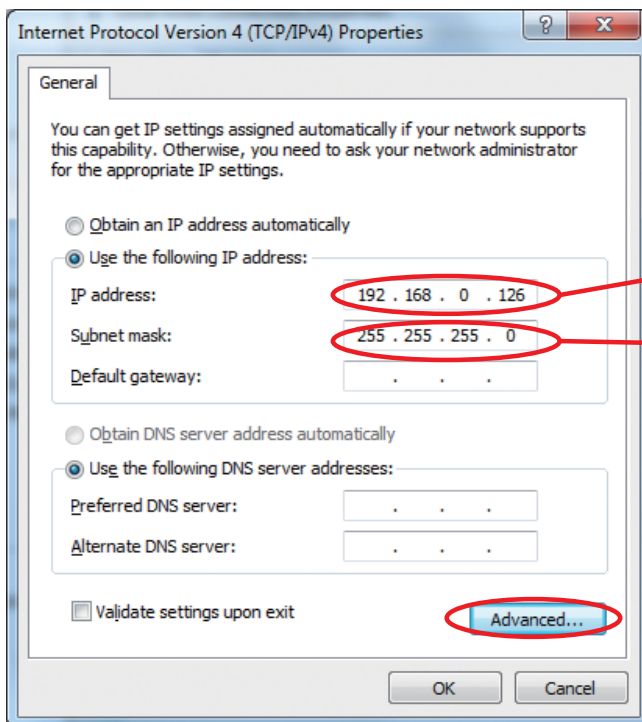
2 pcs of the network card has been equipped.

Assign the IP address to 2 pcs of the network card as follows.



[For the primary network card]

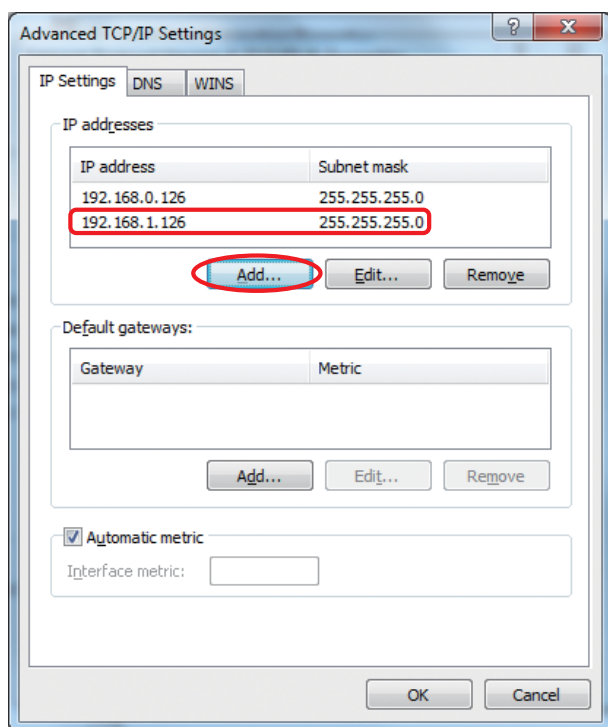
Set the VIP and click the icon of Advanced as follows.



It shows an example of setting "192.168.0.126" for VIP.

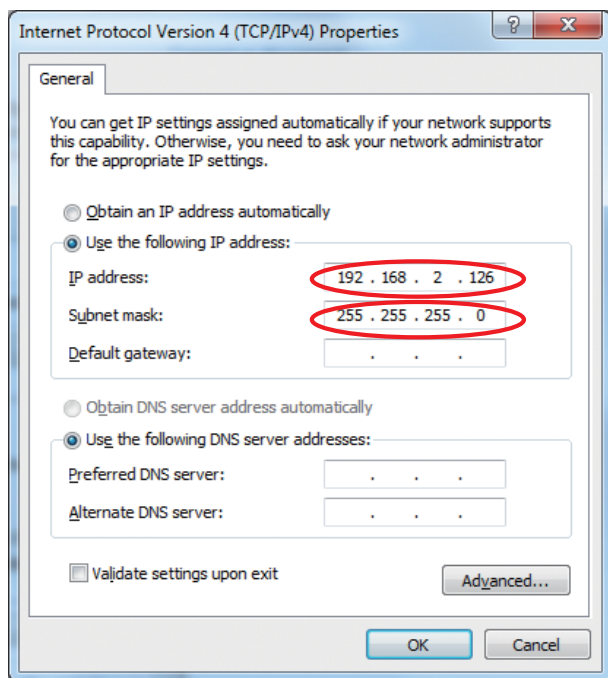
Set "255.255.255.0" for subnet mask.

Click the icon of Add and set PIP-A (Physical IP address for LAN A).



**[For the secondary network card]**

Set PIP-B (Physical IP address for LAN B).

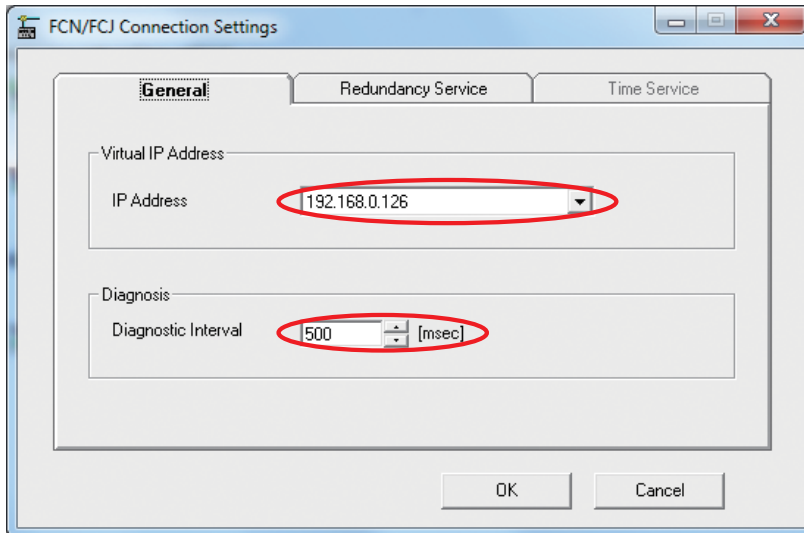


## 2.2 Setting of the redundant package

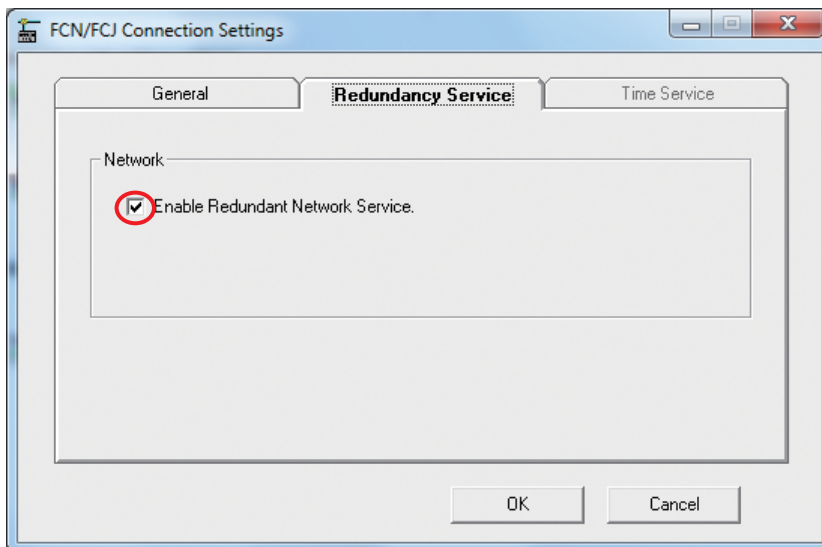
### [Prior condition]

Duplex Network Function License for FCN/FCJ OPC Server has been installed.

- (1) Set Virtual IP address and Diagnostic Interval as follows.



- (2) Tick Enable Redundant network service as follows, then re-start the PC.



## 2.3 Setting of PCAS application

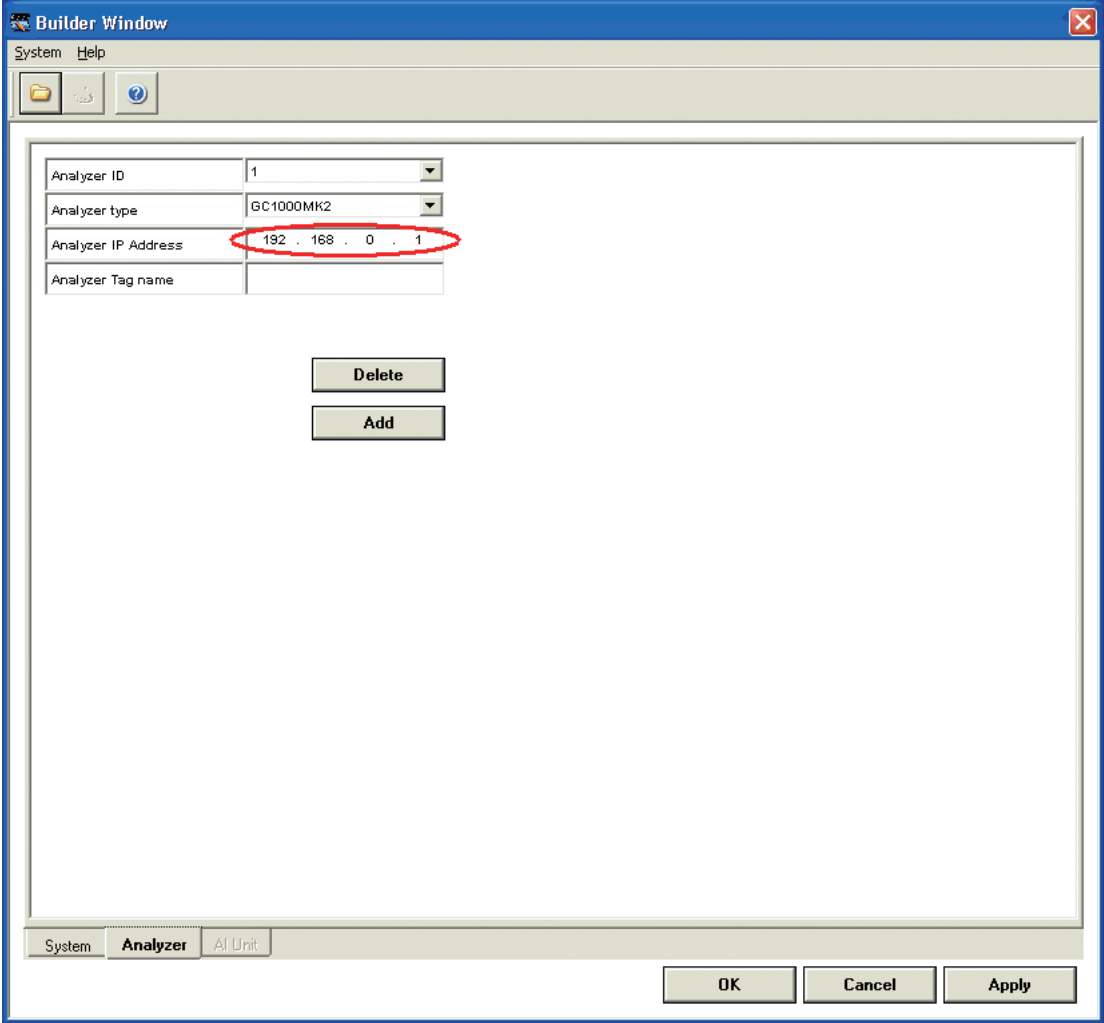
- (1) Set the VIP of PCAS to "PCAS IP Address".

When the other PCAS is on the same network, set the VIP of the other PCAS to "Another PCAS IP Address".

PCAS ID	247
PCAS IP Address	192 . 168 . 0 . 126
Analyzer num.	10
Network Type	Dual
PCAS Type	Primary
Save term for Latest ana. result(Mon)	0
Disk for Latest ana. result(GB)	0.0
Save term for Hist. chrom.(Full)(Mon)	0
Disk for Hist. chrom.(Full)(GB)	0.0
Save term for Hist. chrom.(1/10)(Mon)	2
Disk for Hist. chrom.(1/10)(GB)	0.2
Save term for ASIU trend(Mon)	0
Disk for ASIU trend(GB)	0.0
Save term for ASIU ave.(Mon)	12
Disk for ASIU ave.(GB)	0.0
Disk Full alarm size(MB)	2000
Disk Full error size(MB)	1000
PCAS Tag name	
Another PCAS IP Address	0 . 0 . 0 . 0
Auto delete check time	2 : 00
Save com. log	OFF
Max. log size(MB)	10



(2) Set the VIP of the GC8000, GC1000 MarkII, and ASIU to "Analyzer IP Address".



## 2.4 Setting of GCVT application

Set the VIP of GCVT to "IP Address", and the VIP of PCAS to "PCAS IP Address".  
"Network type" select "Dual".

The screenshot shows the 'Fundamental Information Settings' dialog box with the following configuration:

Field	Value
IP Address	192 . 168 . 0 . 125
PCAS IP Address	192 . 168 . 0 . 121
Pop-up	Show
Same Peak Alarm Detect	3
Data Storage Period	12
Auto-delete Time	2 : 00
Network Type	Dual
Warning Size (MB)	4000
Maximum Size (MB)	2000
Data Storage	C:\GCVT\data
Save com. Log	On
Max. log size(MB)	10

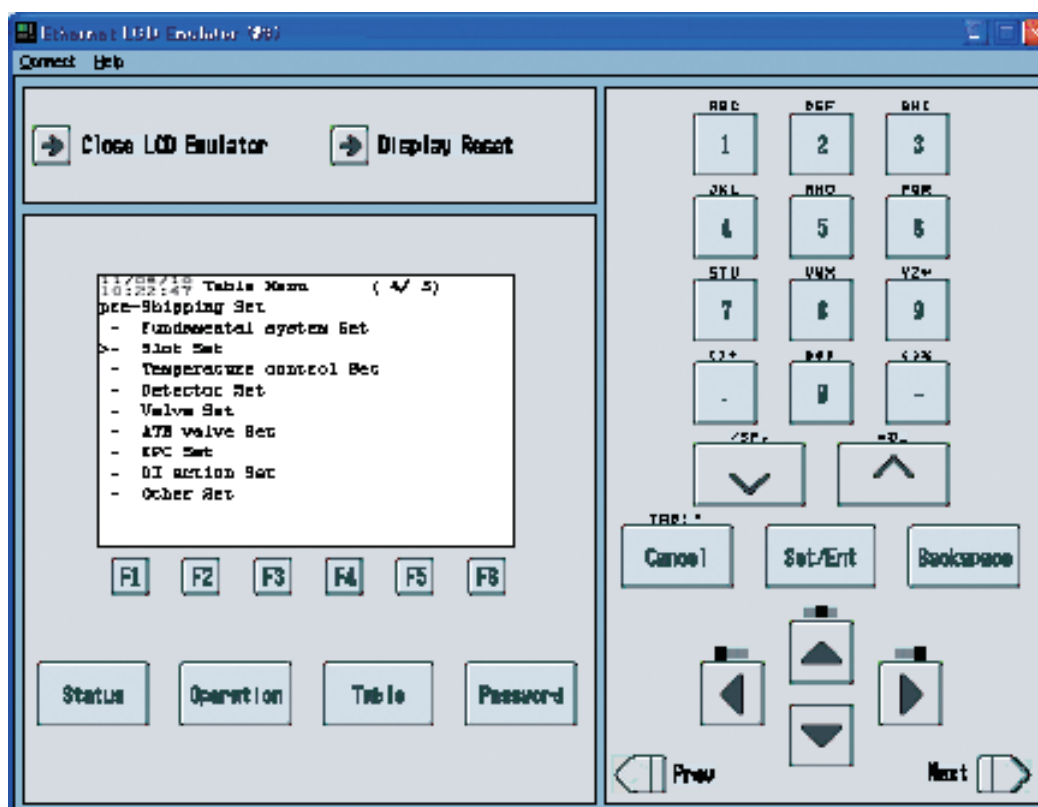
Buttons: OK, Cancel

## 3. Process Gas Chromatograph

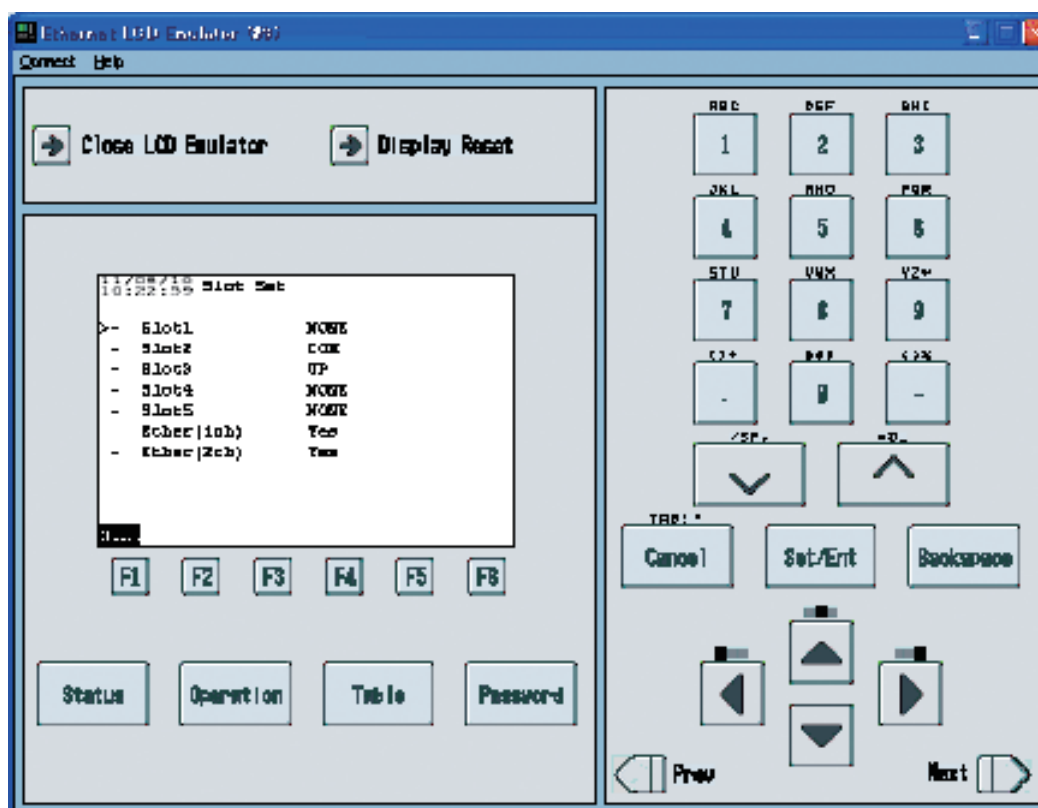
### 3.1 Checking settings of GC8000

Note: Do not change the following preset settings if not necessary.

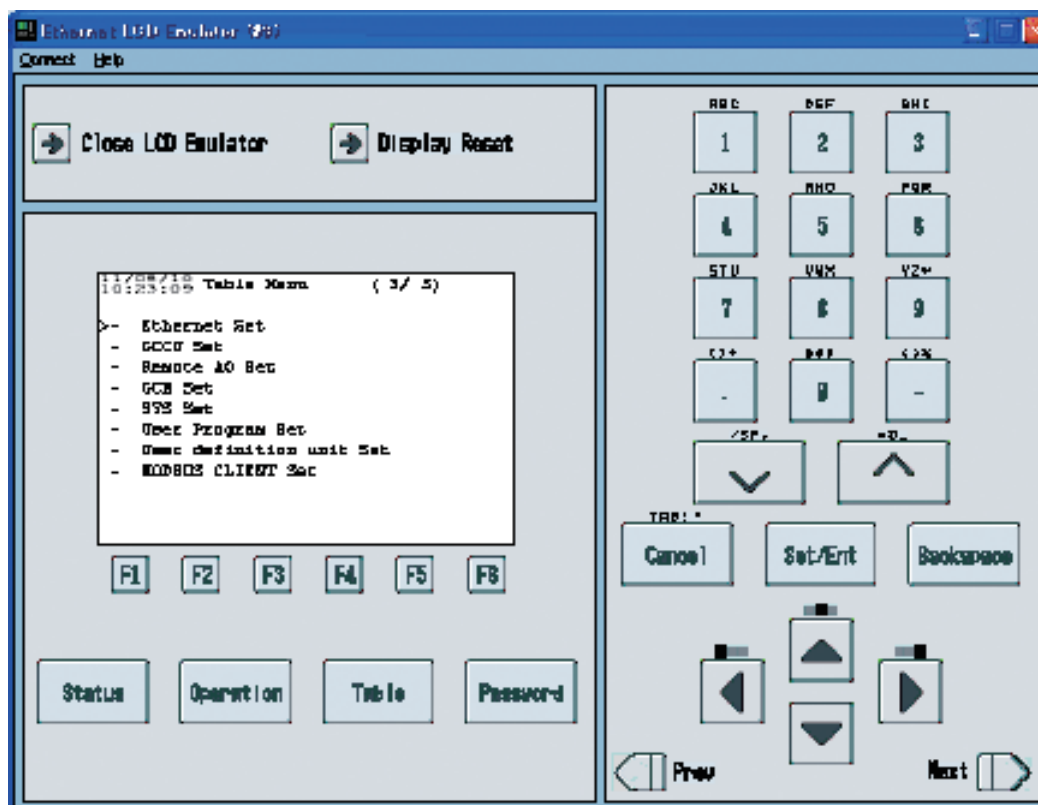
- (1) Select the setting of "Slot Set" in the Table Menu in the EtherLCD Emulator.



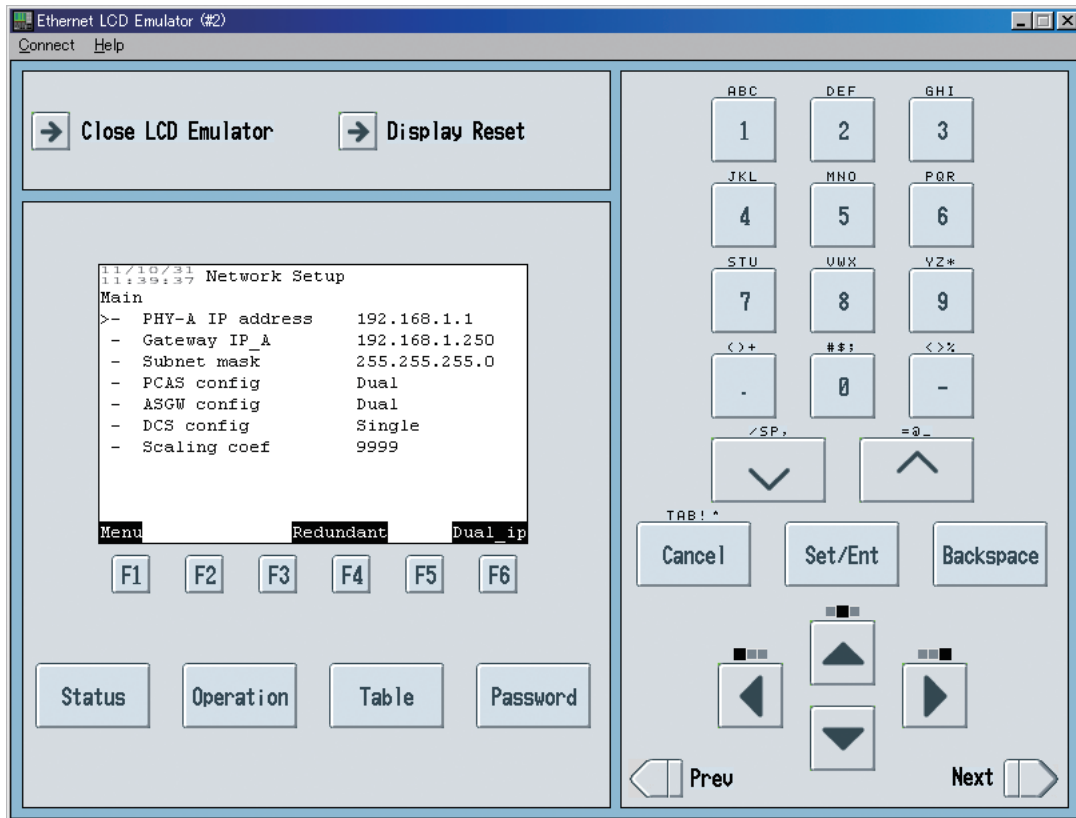
- (2) Check the setting of "Ether (2ch)" should be "Yes".



- (3) Select the setting of "Ethernet Set" in the Table Menu.

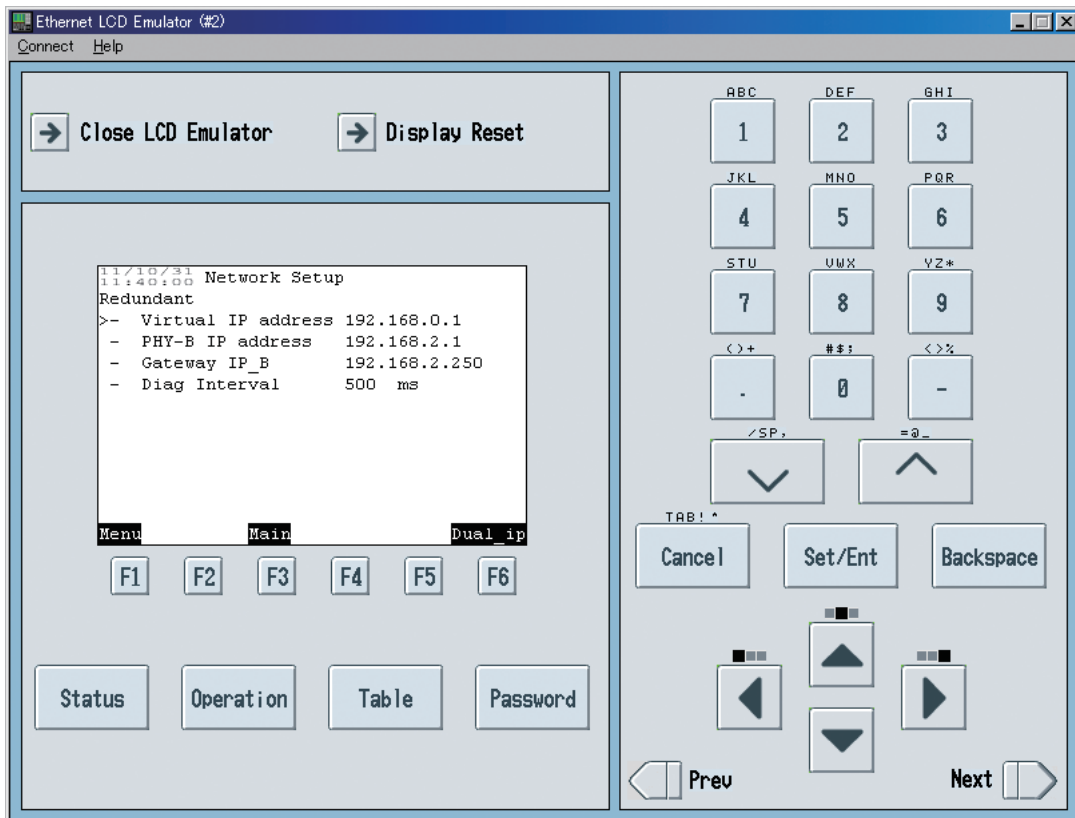


- (4) Check the following settings.
- The address in “1.4 Recommended IP address” should be used for “PHY-A IP address” (PIP-A).
  - The address should not be duplicated to other analyzers.
  - “PCAS config” and “ASGW config” should be set “Dual”, respectively.
- Then click “F4: Redundant”.

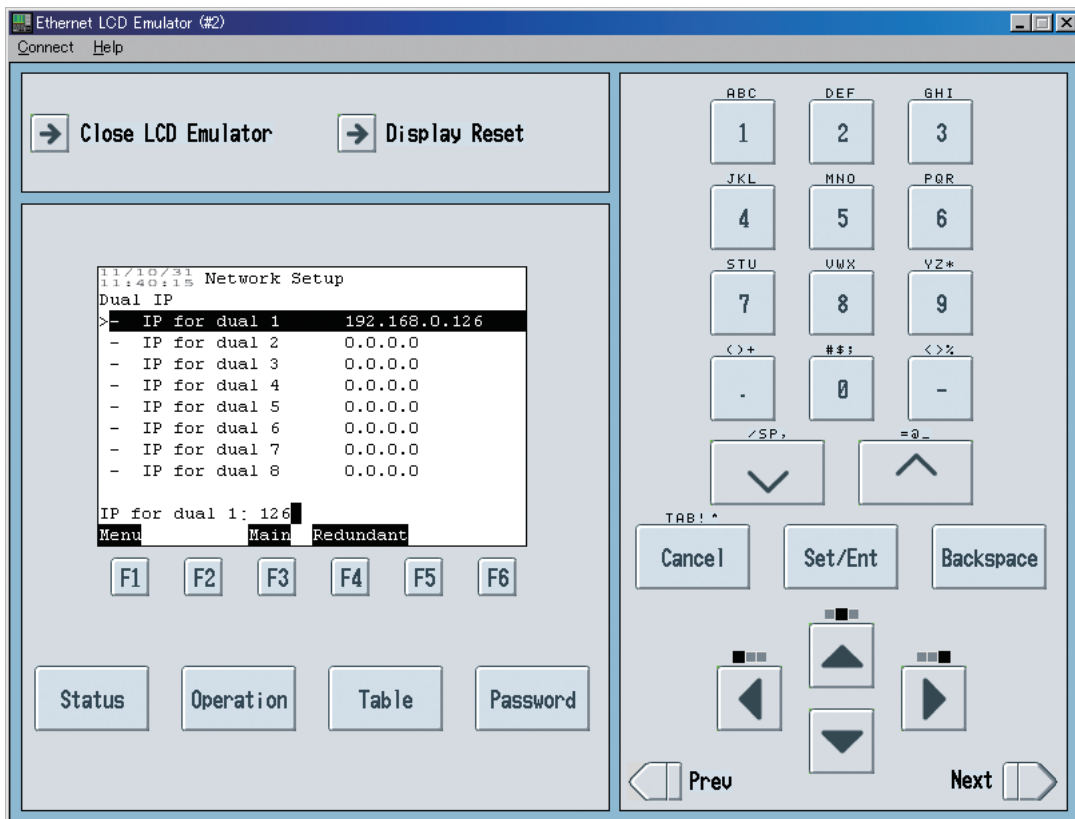


- (5) Check the following settings.
- The address in “1.4 Recommended IP address” should be used for “Virtual IP address” and “PHY-B IP address” (PIP-B).
  - The figure in Table 1 should be set for “Diag Interval”.

Then click "F6: Dual\_ip".



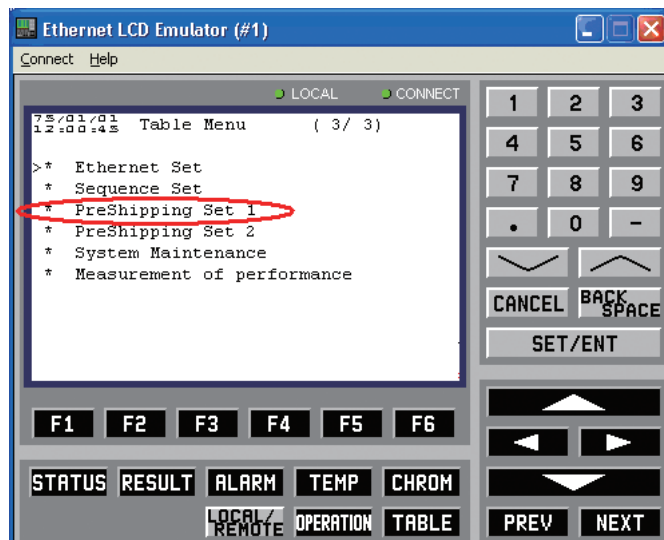
(6) Check the fourth octet of IP address of PCAS and ASGW should be set.



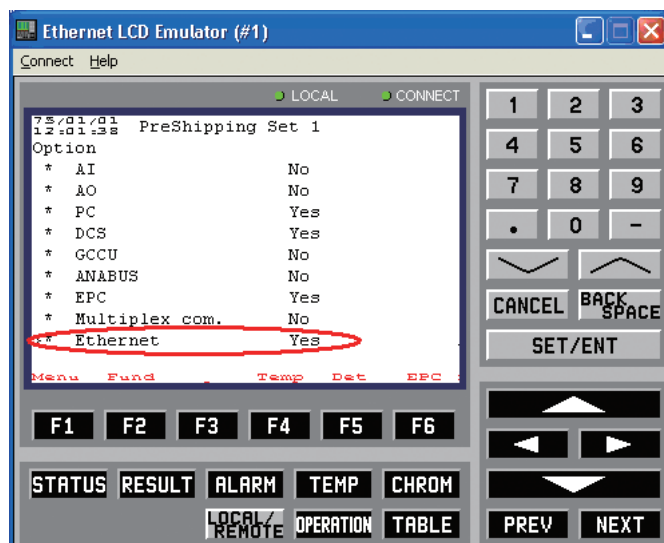
## 3.2 Checking settings of GC1000 MarkII

Note: Do not change the following preset settings if not necessary.

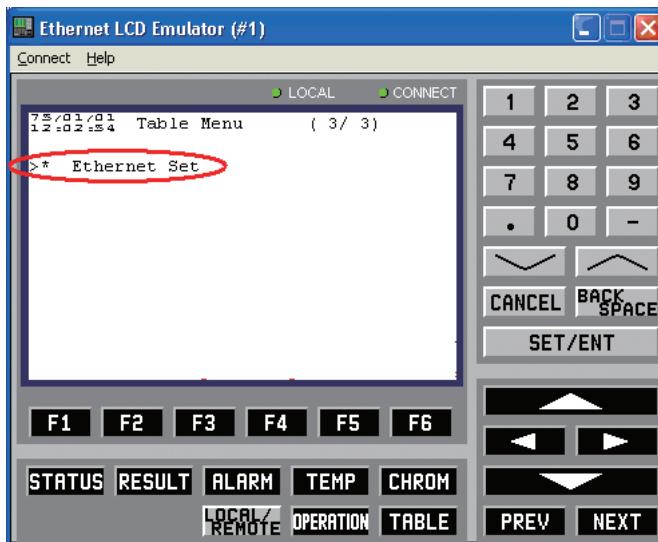
- (1) Select the setting of "PreShipping Set 1" in the Table Menu in the EtherLCD Emulator.



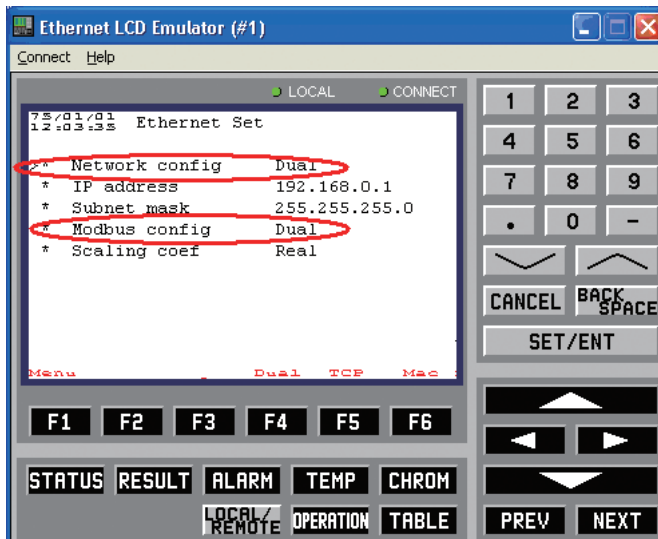
- (2) Check the setting of "Ethernet" should be "Yes".



- (3) Select the setting of “Ethernet Set” in the Table Menu.

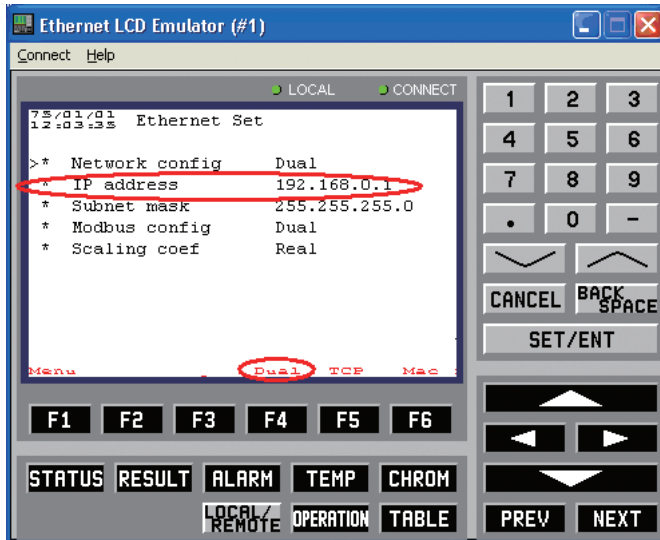


- (4) Check the setting of “Network config” and “Modbus config” should be “Dual”, respectively.

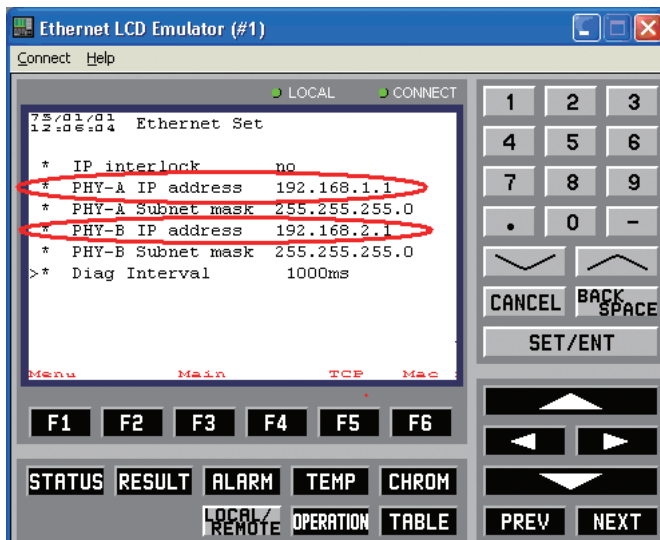


- (5) Check the following settings.
- The address in “1.4 Recommended IP address” should be used for “IP address”.
  - The address should not be duplicated to other analyzers.
- Then click “F4: Dual”.

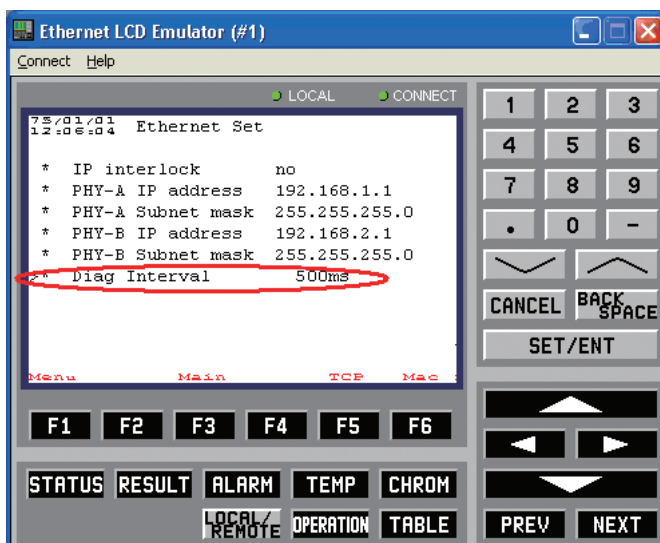




- (6) Check the address in “1.4 Recommended IP address” should be used for “PHY-A IP address” (PIP-A) and “PHY-B IP address” (PIP-B).



- (7) Check the figure in Table 1 should be set for “Diag Interval”.



## 4. ASGW

### 4.1 Setting at Stardom

(1) IP address

When Resource configurator is started up under the IP address setting mode, the message "A new controller is connected (MAC address xx-xx-xx-xx-xx-xx)" is popped up.

Set the VIP by selecting [File] - [IP address set] as follows.

(Refer to IM 11B06E01-01E ASGW Analyzer Server Gateway Software)

It shows an example of setting "192.168.0.111" for VIP.

Set "255.255.255.0" for subnet mask.

(2) Redundancy (Diagnostic interval)

Set "Duplex" in Network and the figure in Table 1 in "Diag Interval".

## 4.2 Setting of the mapping file

Load the mapping file and set the VIP address of the GC8000s which are communicated.

[ASGW\_MAP.CSV]

#STN	1	GC8000	<u>192.168.0.1</u>
#STN	5	GC8000	<u>192.168.0.5</u>
#STN	7	GC8000	<u>192.168.0.7</u>

Set the VIP

## 5. ASIU

### ■ Setting at Stardom

#### (1) IP address

When Resource configurator is started up under the IP address setting mode, the message "A new controller is connected (MAC address xx-xx-xx-xx-xx-xx)" is popped up.

Set the VIP by selecting [File] - [IP address set] as follows.

(Refer to IM 11B06F01-01E ASIU Analyzer Server Interface Unit Software)

The screenshot shows a dialog box titled "Setting IP Address". It contains the following fields and controls:

- MAC Address: 00-00-64-82-81-42
- IP: 192.168.0.101
- Subnet mask: 255.255.255.0
- Gateway: 0.0.0.0
- Time Zone: JST::-540::
- Buttons: OK, Cancel, Help
- Checkbox:  Restart in Maintenance Mode

It shows an example of setting "192.168.0.101" for VIP.

Set "255.255.255.0" for subnet mask.

#### (2) Redundancy (Diagnostic interval)

Set "Duplex" in Network and the figure in Table 1 in "Diag Interval".

The screenshot shows the "Resource Configurator" application window. The "CPU Module" section is active, and the "Network" settings are visible. The "Duplex" dropdown menu is set to "Duplex", and the "Diag Interval" is set to "3000 mSec". The status bar at the bottom of the window displays "Ready".

## 6. Troubleshooting

### ● Case 1

The redundant function between PCAS and GC8000/GC1000 MarkII does not work properly.

#### <Meas>

The possible cause is the security setting on a PC. Try any of three of the following by setting Security Center Set. - The priority level of the action is the following numerical orders.

- (1) Registering the following process as an exception.  
SDNWLre.exe
- (2) Registering the following ports as an exception.  
UDP 1092  
TCP 34308
- (3) Invalidate Security Center.

### ● Case 2

The event is not updated on the event viewer of the PCAS.

#### <Meas>

The possible cause is that the size of the event file exceeds the setting. Customize the log size and overwrite setting by select [Properties] on the [Action] menu of Event Viewer. It is recommended to tick the setting "Log size" of the application log to "Overwrite event as needed."

### ● Case 3

Which line of the network card is used on the PC?

#### <Meas>

Execute [route PRINT] command under DOS prompt.

```
C> route PRINT [CR]
```

```
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
    127.0.0.0              255.0.0.0       127.0.0.1       127.0.0.1         1
    192.168.0.0            255.255.255.0   192.168.0.254   192.168.0.254     1
    192.168.0.6           255.255.255.255 192.168.1.6     192.168.0.254     1
    192.168.0.254         255.255.255.255 127.0.0.1       127.0.0.1         1
    192.168.0.255         255.255.255.255 192.168.0.254   192.168.0.254     1
                                :
    192.168.2.255         255.255.255.255 192.168.2.254   192.168.2.254     1
    224.0.0.0              224.0.0.0       192.168.0.254   192.168.0.254     1
    224.0.0.0              224.0.0.0       192.168.2.254   192.168.2.254     1
    255.255.255.255       255.255.255.255 192.168.2.254   192.168.2.254     1
=====
```

In the above sentence:

```
192.168.0.yyy 255.255.255.255 192.168.1.yyy 192.168.0.xxx 1
```

\* yyy: Host ID of GC8000 or GC1000 MarkII, xxx: Host ID of a PC

If there is the above item, LAN-A is communicated.

```
192.168.0.yyy 255.255.255.255 192.168.2.yyy 192.168.0.xxx 1
```

If there is the above item, LAN-B is communicated.

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# Revision Information

Title : ANABUS Ethernet system Resundancy Setting Manual

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**Mar. 2022/9th Edition**

Added Wireless LAN unit on page 4.

**Aug. 2018/8th Edition**

Revised page 2 (note and the figures)

**June 2018/7th Edition**

Modified some descriptions on page 3.

**June 2018/6th Edition**

Added a note on page 3.

**Mar. 2018/5th Edition**

Revised a figure on page 2.

**Nov. 2014/4th Edition**

Correction (page 21)

**Sep. 2014/3rd Edition**

GCVT is added.

**Dec. 2011/2nd Edition**

GC8000 is added.

**Aug. 2007/1st Edition**

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