Technical Information

ANABUS Ethernet system Redundancy Setting Manual



TI 11B03A03-14E

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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.



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.

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	

Table 1	Guideline of No.	of node vs.	Diagnostic interval	(When Sta	ardom(FCJ) is used)
---------	------------------	-------------	----------------------------	-----------	---------------------

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/soft-ware) 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.

Internet Protocol Version 4 (TCP/IPv4) Properties	
General	
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.	
Obtain an IP address automatically	
O Use the following IP address:	It shows an example of setting
<u>I</u> P address: 192 . 168 . 0 . 126	"192.168.0.126" for VIP.
Subnet mask: 255 . 255 . 0	Set "255.255.255.0" for subnet
Default gateway:	mask.
Obtain DNS server address automatically	
Use the following DNS server addresses:	
Preferred DNS server:	
Alternate DNS server:	
Validate settings upon exit	
OK Cancel	

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

Advanced TCP/IP Settings		? ×
TD Sattings Dug Lumus		
IF Seturigs DNS WINS		
IP add <u>r</u> esses		
IP address	Subnet mask	
192, 168, 0, 126	255,255,255,0	
192.168.1.126	255.255.255.0	
Add	Edit Re	mo <u>v</u> e
De <u>f</u> ault gateways:		
Gateway	Metric	
<u>Ad</u> a		move
Automatic metric	7	
Interface metric:		
	ОК	Cancel

[For the secondary network card]

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

I	internet Protocol Version 4 (TCP/IPv4) Properties
	General
	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
	Obtain an IP address automatically
	O Use the following IP address:
	IP address: 192.168.2.126
1	Subnet mask: 255 . 255 . 255 . 0
	Default gateway:
	Obtain DNS server address automatically
	O Use the following DNS server addresses:
	Preferred DNS server:
	Alternate DNS server:
	Validate settings upon exit
	OK Cancel

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.

i	FCN/FCJ Connection Settin	gs	
	General	Redundancy Service	Time Service
	Virtual IP Address	100 100 0 100	
		1192.168.0.126	
	Diagnosis Diagnostic Interval	500 - [meac]	
		· Image	
		0K	Cancel

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

<u>ل</u>	FCN/FCJ Connection Settings		
	General	Redundancy Service	Time Service
	Network	etwork Service.	
		<u> </u>	Cancel

2.3 Setting of PCAS application

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".

Builder Window				
<u>System</u> <u>H</u> elp	jystem <u>H</u> elp			
[
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				
Save com. log	OFF _			
Max. log size(MB)	10			
System Analyzer All Unit				
	OK Cancel Apply			

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

🐺 Builder Window		
System Help		
		1
Analyzer ID 1		
Analyzer type GC1000MK2		
Analyzer IP Address 192 . 168 . 0 . 1		
Analyzer Tag name		
Delete		
Add		
Sustem Analuzer All (Prit		
	OK Cancel	Apply

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".

Fundamental Information Setting	2	×
IP Address	192 . 168 . 0 . 125	
PCAS IP Address	192 . 168 . 0 . 121	
Рор-ир	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	Browse
Save com. Log	On 💌	
Max. log size(MB)	10	
	ОК	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.



- Ethernet LOD Encloter 1980 E 🗆 🔽 Qomest Help RBC DEF BHC Close LCD Equiator 🌛 Display Reset 1 2 3 JK L RHO. F9R 5 ŧ, 5 STU 998 YZ₩ 10:22:35 Slot Set 7 \$ 9 6lotl NORE COR CP NORE NORE -SlotZ 0+ 628 -81059 _ 510t4 91ot5 Ľ _ . -Scher (10b) 760 /5F _ Ebber (Zch) Term \sim THE: :I ... Set/Ent Cance 1 Baokapaoa F1 FZ F3 FI. FS FB Status Operant I on Teb i e Pressor-i Prev Mene t 🛛
- (2) Check the setting of "Ether (2ch)" should be "Yes".

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

Different 190 Evolution (98)	
Close LCD Bullator 🍙 Display Reset	
<pre>11/25/10 Table Nerm. (3/ 5) >- Sthernet Set - GCCF Set - GCS Set - 933 Set - User Program Set - User Program Set - User Program Set - User Chainstion unit Set - UDSDS CLIEST Sec</pre>	6 5 6 5TU VWX YZ* 7 6 9
F1 F2 F3 F4 F5 F8 Statua Operantion Table Password	Cancel Set/Ent Backapace

- (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".

Ethernet LCD Emulator (#2) Connect Help	
→ Close LCD Emulator → Display Reset	ABC DEF GHI 1 2 3 JKL MNO POR
11/10/31 Network Setup Main>- PHY-A IP address192.168.1.1- Gateway IP_A192.168.1.250- Subnet mask255.255.255.0- PCAS configDual- ASGW configDual- DCS configSingle- Scaling coef9999	4 5 6 STU UWX Y2* 7 8 9 ()+ #\$; ()% /SP, =0-
Menu Redundant Dual_ip F1 F2 F3 F4 F5 F6 Status Operation Table Password	Cancel Set/Ent Backspace

- (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".

Ethernet LCD Emulator (#2)	
	ABC DEF GHI
→ Close LCD Emulator → Display Reset	
	JKL MNO PQR
	4 5 6
11/10/31 11:40:00 Network Setup	STU UWX YZ*
Redundant >- Virtual IP address 192.168.0.1	7 8 9
- PHY-B IP address 192.168.2.1 - Gateway IP B 192.168.2.250	()+ #\$; <>%
- Diag Interval 500 ms	. 0 -
	=@
Menu Mein Duelin	
	Cancel Set/Ent Backspace
Status Operation Table Password	
	Preu Next

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

Ethernet LCD Emulator (#2)	
Connect Help	
→ Close LCD Emulator → Display Reset	ABC DEF GHI 1 2 3 JKL MNO POR
	4 5 6 STU VWX VZ*
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	7 8 9
- IP for dual 3 0.0.0.0 - IP for dual 4 0.0.0.0 - IP for dual 5 0.0.0.0	
- IP for dual 6 0.0.0.0 - IP for dual 7 0.0.0.0 - IP for dual 8 0.0.0.0	×5P, =0_
IP for dual 1: 126 Menu Main Redundant	Cancel Set/Ent Backspace
F1 F2 F3 F4 F5 F6 Status Operation Table Password	
	Prev Next

Then click "F6: Dual_ip".

3.2 Checking settings of GC1000 Markll

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".

🔜 Ethernet LCD Emulator (#1)	
<u>Connect</u> <u>H</u> elp	
	1 2 3
75/01/01 12:01:38 PreShipping Set 1	
Option	4 5 6
* AI No	7 0 0
* AO No	1 8 9
* PC Yes	. 0 -
* DCS Yes	• •
* GCCU No	
* ANABUS No	
* EPC Yes	CANCEL BACK
* Multiplex com. No	
er Ethernet Yes	SET/ENT
Menu Fund _ Temp Det EFC :	
F1 F2 F3 F4 F5 F6	
STITUS RESULT MERKIT TENE CIKUN	
REMOTE OPERATION TABLE	PREV NEXT

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

🔜 Ethernet LCD Emulator (#1)	
<u>C</u> onnect <u>H</u> elp	
J LOCAL J CONNECT	1 2 3
75/01/01 12.02.54 Table Menu (3/3)	4 5 6
►* Ethernet Set	
	7 8 9
	• 0 -
	\sim
	CANCEL BACK
	SET/ENT
F1 F2 F3 F4 F5 F6	
STATUS RESULT ALARM TEMP CHROM	
	PREV NEXT

(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".

👪 Ethernet LCD Emulator (#1)			
Connect Help			
J LOCAL J CONNECT	1	2	3
75/01/01 12:05:04 Ethernet Set	4	5	6
* IP interlock no * PHY-A IP address 192.168.1.1	7	8	9
* PHY-A Subnet mask 255.255.255.0 * PHY-B IP address 192.168.2.1	•	0	-
* PHY-B Subnet mask 255.255.255.0	\sim		\sim
	CANCE		CK SPACE
	SE	T/EN	Т
Menu Main TCP Mac :			_
F1 F2 F3 F4 F5 F6			
STATUS RESULT ALARM TEMP CHROM			
REMOTE OPERATION TABLE	PREV	N	EXT

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)" is popped up. Set the VIP by selecting [File] - [IP address set] as follows.

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

Setting IP Address			
MAC Address	00-00-64-82-81-42 -	OK	It shows an example of setting
ть <	192 .168 . 0 .111	Dancel	"192.168.0.111" for VIP.
<u>S</u> ubnet mask 🧲	255 .255 .255 . 0	Help	
<u>G</u> ateway	0.0.0.0		mask.
Time Zone	JST::-540::		
🥅 Restart in Ma	aintenance Mode		

(2) Redundancy (Diagnostic interval)

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

🔐 Resource Configurator - [192.16	3.0.151]	
Eile Edit Yiew Tools Window Help		_ _ ~ ×
💇 🧳 😰 🥔 🖧 🕺 🏝 🔒		R Q 🔷
Image: Second control c	S Hodde S RAS information-Old(1) General General License Enable SB Bus Redundancy Enable Hard-backup for retained data Use JAVA program Enable I/O Module Auto-Load Network Duplex Diag Interval 3000 mSec Detail	RAS information-Old(2) RAS information-Current
A new controller is connected. Upload starts; controlle Upload end	(MAC=00-00-64-82-81-42) x =192.168.0.151 (2006/08/29 15:15)	
<		
Ready		

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)" 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)

Setting IP Address	
MAC Address 00-00-64-82-81-42 OK IP	It shows an example of setting "192.168.0.101" for VIP.
Subnet mask 255 .255 . 0 Help	Set "255.255.255.0" for subnet mask.
Time Zone JST::-540:: 💌	

(2) Redundancy (Diagnostic interval)

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

Resource Configurator - [192.16	3.0.101]					
Eile Edit View Tools Window Help			_ 8 ×			
💇 🧳 😰 🚑 🗛 🐰 🏷 🖻 😭	€ ※ A		R Q 🔶			
Controller configuration	CPU Module	1				
	A RAS information-O General	ld(1)	A RAS information-Old(2)			
IOM ■ III ControlApplication		er License	S RAS Information-Current			
	I Enable SB Bus Redundancy					
	Enable Hard-backup for retained data					
	Use JAVA program					
	I✓ Enable I/0 Module Auto-Load					
	Network					
	Duplex					
	Diag Interval 3000	mSec Detail				
A new controller is connected.	(MAC=00-00-64-82-81-42)					
Unload starts: controlle	r =192.168.0.101 (2006/08/29	15:15)				
Upload end		10.10,				
<						
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 in 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.ууу	255.255.255.255	192.168.1.yyy	192.168.0.xxx	1			
* yyy: Host IE	of GC8000 or GC1000) MarkII, xxx: Host ID c	of a PC				
If there is the above item, LAN-A is communicated.							
192.168.0.ууу	255.255.255.255	192.168.2.ууу	192.168.0.xxx	1			
If there is the above ite	m, LAN-B is communic	ated.					

Revision Information

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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.

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