




**User Manual**  
  
for the  
  
**Gigabit Ethernet Adapter**  
  
**VxWorks Software Driver**

<b>C<sup>2</sup>I<sup>2</sup> Systems Document No.</b>	CCII/GE/6-MAN/002
<b>Document Issue</b>	1.1
<b>Issue Date</b>	2009-08-20
<b>Print Date</b>	2009-08-20
<b>File Name</b>	W:\GE\TECHMAN\CGEMAN02.WPD
<b>Distribution List No.</b>	

© C<sup>2</sup>I<sup>2</sup> Systems *The copyright of this document is the property of C<sup>2</sup>I<sup>2</sup> Systems. The document is issued for the sole purpose for which it is supplied, on the express terms that it may not be copied in whole or part, used by or disclosed to others except as authorised in writing by C<sup>2</sup>I<sup>2</sup> Systems.*

## Signature Sheet

Name	Signature	Date
Completed by  PP X. Keuger	 Project Engineer Board Level Products C <sup>2</sup> I <sup>2</sup> Systems	2009-08-20
	Project Engineer Board Level Products C <sup>2</sup> I <sup>2</sup> Systems	
Accepted by  L DE Lmmn	 Project Manager Board Level Products C <sup>2</sup> I <sup>2</sup> Systems	2009-08-28
	Project Manager Board Level Products C <sup>2</sup> I <sup>2</sup> Systems	
Accepted by  X. Keuger	 Quality Assurance C <sup>2</sup> I <sup>2</sup> Systems	2009-08-20
	Quality Assurance C <sup>2</sup> I <sup>2</sup> Systems	

## Signature Sheet

Name	Signature	Date
Completed by	Project Engineer Board Level Products C <sup>2</sup> I <sup>2</sup> Systems	
	Project Manager Board Level Products C <sup>2</sup> I <sup>2</sup> Systems	
Accepted by	Project Engineer Board Level Products C <sup>2</sup> I <sup>2</sup> Systems	
	Project Manager Board Level Products C <sup>2</sup> I <sup>2</sup> Systems	
Accepted by	Quality Assurance C <sup>2</sup> I <sup>2</sup> Systems	

## Amendment History

Issue	Description	Date	ECP No.
0.1	First draft.	2007-02-28	-
0.2	Added command line parameter descriptions.	2007-06-07	-
1.0	Procedure added describing the addition of larger Network Stack Memory Pool data clusters.	2007-10-18	CCII/GE/6-ECP/008
1.1	Improve document naming consistency.	2009-08-20	CCII/GE/6-ECP/017

# Contents

<b>1. Scope</b>	<b>1</b>
1.1 Identification	1
1.2 System Overview	1
1.3 Document Overview	1
<b>2. Applicable and Reference Documents</b>	<b>2</b>
2.1 Applicable Documents	2
2.2 Reference Documents	2
<b>3. Software Driver Distribution</b>	<b>3</b>
<b>4. Installation Procedure</b>	<b>4</b>
4.1 Large UDP Packet Support	4
4.1.1 Procedure for VxWorks 5.5 (if building target images using Tornado)	4
4.1.2 Procedure for VxWorks 5.5 (if building target images using the command line)	4
4.1.3 Procedure for VxWorks 6.x (if building target images using the Workbench IDE)	4
4.2 To Build the Gigabit Ethernet VxWorks Software Driver into the VxWorks Kernel	4
4.3 To Load the Software Driver Separately	4
<b>5. Using the Gigabit Ethernet Software Driver</b>	<b>5</b>
5.1 DualNet and RLMT Modes	5
5.2 Loading and Starting the Driver in DualNet Mode	5
5.3 Loading and Starting the Driver in RLMT Mode	5
5.4 Command Line Parameters	5
<b>6. Contact Details</b>	<b>10</b>
6.1 Contact Person	10
6.2 Physical Address	10
6.3 Postal Address	10
6.4 Voice and Electronic Contacts	10
6.5 Product Support	10
<b>Annexure A</b>	<b>11</b>
Making Changes to sysNet.c for X86	11
<b>Annexure B</b>	<b>12</b>
Making Changes to usrNetLib.c for Large UDP Packets	12

CCII/GE/6-MAN/002	2009-08-20	Issue 1.1
CGEMAN02.WPD		Page iv of v

## Abbreviations and Acronyms

API	Application Program Interface
BIT	Built-In Test
bit/s	bits per second
BSP	Board Support Package
CCPMC	Conduction-Cooled Peripheral Component Interconnect Mezzanine Card
CD	Carrier Detect
CRC	Cyclic Redundancy Check
EEPROM	Electrically Erasable and Programmable Read Only Memory
FIFO	First In First Out
GE	Gigabit Ethernet
I/O	Input / Output
LED	Light Emitting Diode
MHz	MegaHertz
PC	Personal Computer
PCI	Peripheral Component Interconnect
PMC	Peripheral Component Interconnect Mezzanine Card
POST	Power-On Self Test
RAM	Random Access Memory
SBC	Single Board Computer

1. **Scope**

1.1 Identification

This document is the user manual for the Gigabit Ethernet VxWorks Software Driver.

1.2 System Overview

The Gigabit Ethernet Adapter attach computers to 10 Mbit/s, 100 Mbit/s and 1 Gbit/s Ethernet networks using Copper or Fibre cabling.

The GE Adapter is currently available in Air-Cooled PMC, Conduction-Cooled PMC (CCPMC) and PCI-104 formfactors.

Applicable Part Numbers are :

PMC

CCII/GNET/PMC/2P/RJ/FP/COM	UTP Commercial Grade Adapter
CCII/GNET/PMC/2P/RJ/FP/IND	UTP Industrial Grade Adapter
CCII/GNET/PMC/2P/SX/FP/COM	Multimode Fibre Commercial Grade Adapter
CCII/GNET/PMC/2P/SX/FP/IND	Multimode Fibre Industrial Grade Adapter
CCII/GNET/PMC/2P/LX/FP/COM	Singlemode Fibre Commercial Grade Adapter
CCII/GNET/PMC/2P/LX/FP/IND	Singlemode Fibre Industrial Grade Adapter

CCPMC

CCII/GNET/PMC/2P/BP/CC	UTP Backplane I/O, Conduction-Cooled Adapter
------------------------	--

PCI-104

CCII/GNET/PC104/2P/RJ/COM	UTP Commercial Grade Adapter
CCII/GNET/PC104/2P/RJ/IND	UTP Industrial Grade Adapter
CCII/GNET/PC104/2P/SX/COM	Multimode Fibre Commercial Grade Adapter
CCII/GNET/PC104/2P/SX/IND	Multimode Fibre Industrial Grade Adapter
CCII/GNET/PC104/2P/LX/COM	Singlemode Fibre Commercial Grade Adapter
CCII/GNET/PC104/2P/LX/IND	Singlemode Fibre Industrial Grade Adapter

The software driver binaries are provided with explicit installation instructions.

1.3 Document Overview

This document gives an overview of the Gigabit Ethernet VxWorks Software Driver installation procedure and its Application Program Interface (API).

CCII/GE/6-MAN/002	2009-08-20	Issue 1.1
CGEMAN02.WPD		Page 1 of 12

2. **Applicable and Reference Documents**

2.1 Applicable Documents

2.1.1 CCII/GE/6-MAN/001, *Hardware Reference Manual for the Gigabit Ethernet Adapter.*

2.2 Reference Documents

None.

CCII/GE/6-MAN/002	2009-08-20	Issue 1.1
CGEMAN02.WPD		Page 2 of 12



### 3. Software Driver Distribution

The software driver distribution consists of (at least) the following files :

ccGeEnd<arch><.vxworks\_version>.a

Host-architecture specific, driver object file :

*cc* - CCII Systems (Pty) Ltd

*GeEnd* - Enhanced Network Device (END)  
VxWorks software driver

<*arch*> - Host for which the binary is built :

- X86

- 18x (Dy4 181/182/183)

- Mv5100 (Motorola MVME-5100)

<*vxworks\_version*> - VxWorks version :

- .62 (VxWorks 6.2)

- *blank* (VxWorks 5.5.1)

e.g. "ccGeEnd18x.62.a" for Gigabit Ethernet VxWorks Software Driver built for a DY4 SVME/DMV 181 PowerPC host for VxWorks 6.2.

Readme.txt

General information and installation notes.

Release.txt

Release notes and revision history :

Please check this file for information on the latest updates.

sysCcGeEnd.c

PCI initialisation for X86 BSPs. See Annexure A.

CCII/GE/6-MAN/002	2009-08-20	Issue 1.1
CGEMAN02.WPD		Page 3 of 12

## 4. Installation Procedure

This paragraph describes the installation procedure for the Gigabit Ethernet VxWorks Software Driver. (The examples given are for a DY4 SVME/DMV181 PowerPC host).

### 4.1 Large UDP Packet Support

In order to transmit large UDP packets (typically larger than 1 992 bytes), the VxWorks "Network Stack Memory Pool Configuration" has to be changed to add larger data clusters. The procedure for doing this differs between VxWorks 5.5 and VxWorks 6.x.

#### 4.1.1 Procedure for VxWorks 5.5 (if building target images using Tornado)

This configuration change cannot be performed from the Tornado Project GUI itself. The file {tornado}/target/config/comps/src/net/usrNetLib.c needs to be changed as shown in Annexure B.

The example in Annexure B adds 10 clusters each of 4 096, 8 192, 16 384, 32 768 and 65 536 bytes to the Network Stack Memory Pool. This translates to an additional 1,21 MB of system memory being allocated to the Network Stack Memory Pool. Depending on the availability of free memory resources, the number of clusters added can be adjusted. A new VxWorks target image has to be built for these changes to take effect.

#### 4.1.2 Procedure for VxWorks 5.5 (if building target images using the command line)

If you are using the command line to build your VxWorks target images, the relevant file to edit will be {tornado}/target/src/config/usrNetwork.c (not usrNetLib.c). The basic procedure and changes though are roughly the same as those indicated in Annexure B. A new VxWorks target image has to be built for these changes to take effect.

#### 4.1.3 Procedure for VxWorks 6.x (if building target images using the Workbench IDE)

The Network Stack Memory Configuration can be reconfigured in the Workbench IDE for your VxWorks 6.x target images. Under the Project Navigator tab, double click on Kernel Configuration for the current VxWorks image project. In the Component configuration window, expand and select the "Network Components > Network Core Components > Network Stack Memory Pool Configuration" branch and change the relevant Property Values to include additional (larger than 2 048 bytes) clusters. A new VxWorks target image has to be built for these changes to take effect.

### 4.2 To Build the Gigabit Ethernet VxWorks Software Driver into the VxWorks Kernel

Assume the BSP directory is given as : BSP\_DIR = /tornado/target/config/dy4181.

- Copy ccGeEnd18x.a to your \$(BSP\_DIR)/lib directory as ccGeEnd.a.
- In the Builds section of the Project Workspace, change the Kernel properties to include the ccGeEnd.a library file in the Macros LIBs option.
- Rebuild all VxWorks images.

### 4.3 To Load the Software Driver Separately

Note : This step is not required if the software driver was built into the BSP.

If the software driver is not built into the BSP, a user can load it separately :

- Copy ccGeEnd18x.a to your present working directory as ccGeEnd.a.
- From the VxWorks shell, type :
  - Id < ccGeEnd.a

CCII/GE/6-MAN/002	2009-08-20	Issue 1.1
CGEMAN02.WPD		Page 4 of 12

## 5. Using the Gigabit Ethernet Software Driver

### 5.1 DualNet and RLMT Modes

The two ports of the GE Adapter may be used either to provide two independent communication channels (DualNet mode) or as a single dual redundant channel (RLMT mode).

In DualNet mode, each channel is assigned its own IP address.

In RLMT mode, the secondary port becomes a "hot standby" in the event of failure of the primary port. Only one IP address is assigned as the hardware will determine over which physical channel the data is routed.

### 5.2 Loading and Starting the Driver in DualNet Mode

To start the driver in DualNet mode :

```
muxDevStart (muxDevLoad(0,geLoad,"",0,0))  
muxDevStart (muxDevLoad(1,geLoad,"",0,0))
```

This will create two devices, "ccge0" and "ccge1".

### 5.3 Loading and Starting the Driver in RLMT Mode

To start the driver in RLMT mode :

```
muxDevStart (muxDevLoad(0,geLoad,"RlmtMode=CheckLinkState",0,0))
```

### 5.4 Command Line Parameters

The general form of the Gigabit Ethernet Software Driver loads command is as follows :

```
muxDevLoad(device,geLoad,"parameter-1:parameter-2:parameter-3...",0,0)
```

where *device* is a unique instance number starting from 0, and *parameter-n* is as described in the following table :

Parameter	Description	Permitted Values	Default Value
Speed_A Speed_B	This parameter is used to set the speed capabilities. It is only valid for copper adapters. Usually, the speed is negotiated between the two channels during link establishment. If this fails, a channel can be forced to a specific setting with this parameter.	10 100 1 000 Auto	Auto
AutoNeg_A AutoNeg_B	The "Sense"-mode automatically detects whether the link partner supports auto-negotiation or not.	On Off Sense	On
DupCap_A DupCap_B	This parameter is only relevant if auto-negotiation for this channel is not set to "Sense". If auto-negotiation is set to "On", all three values are possible. If it is set to "Off", only "Full" and "Half" are allowed. This parameter is useful if your link partner does not support all possible combinations.	Half Full Both	Both

CCII/GE/6-MAN/002	2009-08-20	Issue 1.1
CGEMAN02.WPD		Page 5 of 12

Parameter	Description	Permitted Values	Default Value																																										
FlowCtrl_A FlowCtrl_B	<p>This parameter can be used to set the flow control capabilities the channel reports during auto-negotiation. It can be set for each channel individually.</p> <ul style="list-style-type: none"> <li>• <b>Sym</b> = Symmetric : both link partners are allowed to send PAUSE frames.</li> <li>• <b>SymOrRem</b> = SymmetricOrRemote : both or only remote partner are allowed to send PAUSE frames.</li> <li>• <b>LocSend</b> = LocalSend : only local link partner is allowed to send PAUSE frames.</li> <li>• <b>None</b> = No link partner is allowed to send PAUSE frames.</li> </ul>	Sym SymOrRem LocSend None	SymOrRem																																										
Role_A Role_B	<p>This parameter is only valid for the copper adapters. For two 1 000 Base-T adapters to communicate, one must take the role of the master (providing timing information), while the other must be the slave. Usually, this is negotiated between the two adapters during link establishment. If this fails, an adapter can be forced to a specific setting with this parameter.</p>	Auto Master Slave	Auto																																										
ConType	<p>The parameter 'ConType' is a combination of all five per-channel parameters within one single parameter. This simplifies the configuration of both channels of an adapter. The different values of this variable reflect the most meaningful combinations of channel parameters.</p> <p>The following table shows the values of 'ConType' and the corresponding combinations of the per-channel parameters :</p> <table border="1"> <thead> <tr> <th>ConType</th> <th>DupCap</th> <th>AutoNeg</th> <th>FlowCtrl</th> <th>Role</th> <th>Speed</th> </tr> </thead> <tbody> <tr> <td>Auto</td> <td>Both</td> <td>On</td> <td>SymOrRem</td> <td>Auto</td> <td>Auto</td> </tr> <tr> <td>1000FD</td> <td>Full</td> <td>Off</td> <td>None</td> <td>Auto (ignored)</td> <td>1000</td> </tr> <tr> <td>100FD</td> <td>Full</td> <td>Off</td> <td>None</td> <td>Auto (ignored)</td> <td>100</td> </tr> <tr> <td>100HD</td> <td>Half</td> <td>Off</td> <td>None</td> <td>Auto (ignored)</td> <td>100</td> </tr> <tr> <td>10FD</td> <td>Full</td> <td>Off</td> <td>None</td> <td>Auto (ignored)</td> <td>10</td> </tr> <tr> <td>10HD</td> <td>Half</td> <td>Off</td> <td>None</td> <td>Auto (ignored)</td> <td>10</td> </tr> </tbody> </table> <p>Stating any other channel parameter together with this 'ConType' variable will result in a merged configuration of those settings. This due to the fact, that the per-channel parameters (e.g. Speed_?) have a higher priority than the combined variable 'ConType'.</p> <p>Note : This parameter is always used on both channels of the adapter.</p>	ConType	DupCap	AutoNeg	FlowCtrl	Role	Speed	Auto	Both	On	SymOrRem	Auto	Auto	1000FD	Full	Off	None	Auto (ignored)	1000	100FD	Full	Off	None	Auto (ignored)	100	100HD	Half	Off	None	Auto (ignored)	100	10FD	Full	Off	None	Auto (ignored)	10	10HD	Half	Off	None	Auto (ignored)	10	Auto 1000FD 100FD 100HD 10FD 10HD	Auto
ConType	DupCap	AutoNeg	FlowCtrl	Role	Speed																																								
Auto	Both	On	SymOrRem	Auto	Auto																																								
1000FD	Full	Off	None	Auto (ignored)	1000																																								
100FD	Full	Off	None	Auto (ignored)	100																																								
100HD	Half	Off	None	Auto (ignored)	100																																								
10FD	Full	Off	None	Auto (ignored)	10																																								
10HD	Half	Off	None	Auto (ignored)	10																																								
PrefPort	<p>This is used to force the preferred channel to A or B (on dual-channel network adapters). The preferred channel is the one that is used if both are detected as fully functional.</p>	A B	A																																										

Parameter	Description	Permitted Values	Default Value
RlmtMode	<p>RLMT monitors the status of the channel. If the link of the active channel fails, RLMT switches immediately to the standby link. The virtual link is maintained as long as at least one 'physical' link is up.</p> <ul style="list-style-type: none"> <li>• <b>CheckLinkState</b> - Check link state only : RLMT uses the link state reported by the adapter hardware for each individual channel to determine whether a channel can be used for all network traffic or not.</li> <li>• <b>CheckLocalPort</b> - In this mode, RLMT monitors the network path between the two channels of an adapter by regularly exchanging packets between them. This mode requires a network configuration in which the two channels are able to "see" each other (i.e. there must not be any router between the channels).</li> <li>• <b>CheckSeg</b> - Check local channel and segmentation : This mode supports the same functions as the CheckLocalPort mode and additionally checks network segmentation between the channels. Therefore, this mode is only to be used if Gigabit Ethernet switches are installed on the network that have been configured to use the Spanning Tree protocol.</li> <li>• <b>DualNet</b> - In this mode, channels A and B are used as separate devices. If you have a dual channel adapter, channel A will be configured as eth0 and channel B as eth1. Both channels can be used independently with distinct IP addresses. The preferred channel setting is not used. RLMT is turned off.</li> </ul> <p>Note : RLMT modes CLP and CLPSS are designed to operate in configurations where a network path between the channels on one adapter exists. Moreover, they are not designed to work where adapters are connected back-to-back.</p>	CheckLinkState CheckLocalPort CheckSeg DualNet	DualNet
IntsPerSec	<p>This parameter is only used, if either static or dynamic interrupt moderation is used on a network adapter. Using this parameter if no moderation is applied, will lead to no action performed.</p> <p>This parameter determines the length of any interrupt moderation interval. Assuming that static interrupt moderation is to be used, an 'IntsPerSec' parameter value of 2 000 will lead to an interrupt moderation interval of 500 microseconds.</p> <p>Note : The duration of the moderation interval is to be chosen with care. At first glance, selecting a very long duration (e.g. only 100 interrupts per second) seems to be meaningful, but the increase of packet-processing delay is tremendous. On the other hand, selecting a very short moderation time might compensate the use of any moderation being applied.</p>	30 ... 40 000 (interrupts per second)	2 000

Parameter	Description	Permitted Values	Default Value
Moderation	<p>Interrupt moderation is employed to limit the maximum number of interrupts the driver has to serve. That is, one or more interrupts (which indicate any transmit or receive packet to be processed) are queued until the driver processes them. When queued interrupts are to be served, is determined by the 'IntsPerSec' parameter, which is explained later below.</p> <ul style="list-style-type: none"> <li>• <b>None</b> - No interrupt moderation is applied on the adapter. Therefore, each transmit or receive interrupt is served immediately as soon as it appears on the interrupt line of the adapter.</li> <li>• <b>Static</b> - Interrupt moderation is applied on the adapter. All transmit and receive interrupts are queued until a complete moderation interval ends. If such a moderation interval ends, all queued interrupts are processed in one big bunch without any delay. The term 'static' reflects the fact, that interrupt moderation is always enabled, regardless how much network load is currently passing via a particular interface. In addition, the duration of the moderation interval has a fixed length that never changes while the driver is operational.</li> <li>• <b>Dynamic</b> - Interrupt moderation might be applied on the adapter, depending on the load of the system. If the driver detects that the system load is too high, the driver tries to shield the system against too much network load by enabling interrupt moderation. If - at a later time - the CPU utilisation decreases again (or if the network load is negligible) the interrupt moderation will automatically be disabled.</li> </ul> <p>Interrupt moderation should be used when the driver has to handle one or more interfaces with a high network load, which - as a consequence - leads also to a high CPU utilisation. When moderation is applied in such high network load situations, CPU load might be reduced by 20-30%.</p> <p>Note : The drawback of using interrupt moderation is an increase of the round-trip-time (RTT), due to the queueing and serving of interrupts at dedicated moderation times.</p>	None Static Dynamic	Dynamic
LowLatency	<p>This is used to reduce the packet latency time of the adapter. Setting the LowLatency parameter to 'On' forces the adapter to pass any received packet immediately to upper network layers and to send out any transmit packet as fast as possible.</p> <p>Note 1 : The system load increases if LowLatency is set to 'On' and a lot of data packets are transmitted and received.</p> <p>Note 2 : This parameter is only used on adapters which are based on PCI Express compatible chipsets.</p>	On Off	Off
BroadcastPrio	<p>This parameter specifies whether received broadcast packets have the highest priority for the channel switch decision ("Off") or not ("On").</p>	On Off	Off
RlmtMinToVal	Minimum timeout value for RLMT (in $\mu$ s)		30 000
RlmtDefToVal	Minimum timeout value for RLMT (in $\mu$ s)		30 000
RlmtPortdownTimVal	RLMT Port Down Timer (in $\mu$ s)		90 000
RlmtPortstartTimVal	RLMT Port Start Timer (in $\mu$ s)		50 000
RlmtPortupTimVal	RLMT Port Up Timer (in $\mu$ s)		2 500 000

Parameter	Description	Permitted Values	Default Value
RlmtSegToVal	RLMT Network Segmentation Reporting Interval (in $\mu$ s)		900 000 000

Note : If DualNet mode is used, the parameters for both channels must be provided in the first call to muxDevLoad. Parameters provided in the second call will be ignored.

CCII/GE/6-MAN/002	2009-08-20	Issue 1.1
CGEMAN02.WPD		Page 9 of 12

6. **Contact Details**

6.1 Contact Person

Direct all correspondence and / or support queries to the Project Manager (Board Level Products) at C<sup>2</sup>I<sup>2</sup> Systems.

6.2 Physical Address

C<sup>2</sup>I<sup>2</sup> Systems  
Unit 3, Rosmead Place, Rosmead Centre  
67 Rosmead Avenue  
Kenilworth  
Cape Town  
7708  
South Africa

6.3 Postal Address

C<sup>2</sup>I<sup>2</sup> Systems  
P.O. Box 171  
Rondebosch  
7701  
South Africa

6.4 Voice and Electronic Contacts

Tel : (+27) (0)21 683 5490  
Fax : (+27) (0)21 683 5435  
Email : [info.cci@ccii.co.za](mailto:info.cci@ccii.co.za)  
Email : [support@ccii.co.za](mailto:support@ccii.co.za)  
URL : <http://www.cci.co.za/>

6.5 Product Support

Support on C<sup>2</sup>I<sup>2</sup> Systems products is available telephonically between Monday and Friday from 09:00 to 17:00 CAT. Central African Time (CAT = GMT + 2).

Email support is available at [support@ccii.co.za](mailto:support@ccii.co.za)

---

CCII/GE/6-MAN/002	2009-08-20	Issue 1.1
CGEMAN02.WPD		Page 10 of 12



## Annexure A

### Making Changes to sysNet.c for X86

On X86 platforms, the following amendment must be made to the BSP :

Copy the file sysCcGeEnd.c to your BSP configuration directory (target/config/BSPName).

Make the following two amendments to the file sysNet.c in the same directory :

Amendment 1 :

```
#ifndef INCLUDE_END
# include "sysDec21x40End.c" /* dec21x40End support routines */
# include "sysEl3c90xEnd.c" /* el3c90xEnd support routines */
# include "sysElt3c509End.c" /* elt3c509End support routines */
# include "sysFei82557End.c" /* fei82557End support routines */
# include "sysGei82543End.c" /* gei82543End support routines */
# include "sysLn97xEnd.c" /* ln97xEnd support routines */
# include "sysNe2000End.c" /* ne2000End support routines */
# include "sysUltraEnd.c" /* ultraEnd support routines */
# include "sysCcGeEnd.c" /* CCII GE END driver support routines */
#endif /* INCLUDE_END */
```

Amendment 2 :

```
LOCAL VEND_ID_DESC vendorIdEnet [] =
{
    #if defined(INCLUDE_DEC21X40_END)
    {DEC_PCI_VENDOR_ID, sysDec21x40PciInit},
    #endif /* INCLUDE_DEC21X40_END */

    #if defined(INCLUDE_LN_97X_END)
    {AMD_PCI_VENDOR_ID, sysLan97xPciInit},
    #endif /* INCLUDE_LN_97X_END */

    #if defined(INCLUDE_EL_3C90X_END)
    {THREECOM_PCI_VENDOR_ID, sysEl3c90xPciInit},
    #endif /* INCLUDE_EL_3C90X_END */

    #if defined(INCLUDE_GEI8254X_END) || defined(INCLUDE_GEI_HEND)
    {INTEL_PCI_VENDOR_ID, sys543PciInit},
    #endif /* INCLUDE_GEI8254X_END */

    #if defined(INCLUDE_FEI_END)
    {INTEL_PCI_VENDOR_ID, sys557PciInit},
    #endif /* INCLUDE_FEI_END */

    {0x1148, sysCcGePciInit},

    {0xffffffff, NULL} /* last entry */
};
```

Now remake your VxWorks image.

CCII/GE/6-MAN/002	2009-08-20	Issue 1.1
CGEMAN02.WPD		Page 11 of 12

## Annexure B

### Making Changes to usrNetLib.c for Large UDP Packets

```
/* OVS: Added these lines to add larger Network Data Pool clusters to the VxWorks image
*/
/* C²I² Systems: To restore file to original config, simply delete all lines marked
"C²I² Systems" */

/* C²I² Systems */ #undef NUM_CL_BLKs
/* C²I² Systems */ #define NUM_CL_BLKs (NUM_64 + NUM_128 + NUM_256 + NUM_512 + NUM_1024
+ NUM_2048 + NUM_4096 + NUM_8192 + NUM_16384 + NUM_32768 + NUM_65536)
/* C²I² Systems */ #undef NUM_64
/* C²I² Systems */ #define NUM_64 100
/* C²I² Systems */ #undef NUM_128
/* C²I² Systems */ #define NUM_128 100
/* C²I² Systems */ #undef NUM_256
/* C²I² Systems */ #define NUM_256 40
/* C²I² Systems */ #undef NUM_512
/* C²I² Systems */ #define NUM_512 40
/* C²I² Systems */ #undef NUM_1024
/* C²I² Systems */ #define NUM_1024 25
/* C²I² Systems */ #undef NUM_2048
/* C²I² Systems */ #define NUM_2048 25
/* C²I² Systems */ #define NUM_4096 10
/* C²I² Systems */ #define NUM_8192 10
/* C²I² Systems */ #define NUM_16384 10
/* C²I² Systems */ #define NUM_32768 10
/* C²I² Systems */ #define NUM_65536 10

/* C²I² Systems */ #undef NUM_NET_MBLKS
/* C²I² Systems */ #define NUM_NET_MBLKS (2* NUM_CL_BLKs)

CL_DESC clDescTbl [] =
{
/*
clusterSize          num          memArea          memSize
-----
*/
{64,          NUM_64,          NULL,          0},
{128,         NUM_128,         NULL,          0},
{256,         NUM_256,         NULL,          0},
{512,         NUM_512,         NULL,          0},
{1024,        NUM_1024,        NULL,          0},
{2048,        NUM_2048,        NULL,          0},
/* C²I² Systems */ {4096,          NUM_4096,          NULL,          0},
/* C²I² Systems */ {8192,          NUM_8192,          NULL,          0},
/* C²I² Systems */ {16384,         NUM_16384,         NULL,          0},
/* C²I² Systems */ {32768,         NUM_32768,         NULL,          0},
/* C²I² Systems */ {65536,         NUM_65536,         NULL,          0}
};
```