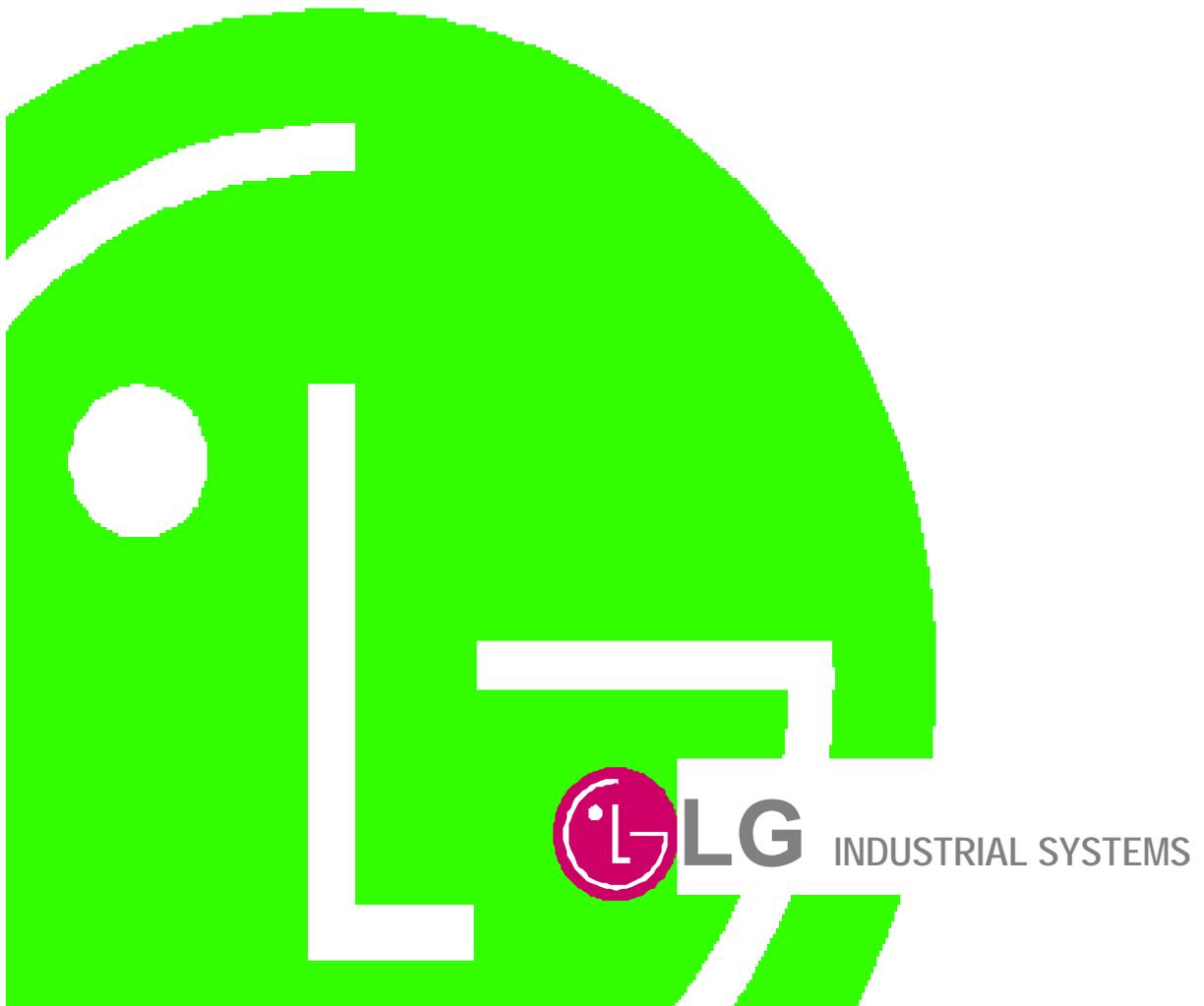


LG Programmable Logic Controller

Ethernet I/F Module

***GLOFA-GM***    **G3L-EUEA**  
**G4L-EUEA**



This user's manual describes functions of Cnet I/F module.  
Please read this manual carefully to understand the functions thoroughly prior to system design.

**Revision record**

| Revision record | Date of issue revised | Contents revised |
|-----------------|-----------------------|------------------|
|                 |                       |                  |

## Contents

|   |                |
|---|----------------|
| <b>Chapter 1 Introduction</b> .....   | <b>1-1-12</b>  |
| 1.1 Matter that demand special attention when using .....                                       | 1-2            |
| <b>Chapter 2 Definition of Terminology</b> .....  | <b>2-1-24</b>  |
| <b>Chapter 3 General Specification</b> .....  | <b>3-1-35</b>  |
| 3 . 1     G e n e r a l     S p e c i f i c a t i o n .....                                     | 3-1            |
| 3 . 2     S t r u c t u r e     a n d     C o m p o n e n t .....                               | 3-3            |
| 3 . 2 . 1     T h e     S t r u c t u r e     o f     G 3 L - E U E A .....                     | 3-3            |
| 3 . 2 . 2     T h e     S t r u c t u r e     o f     G 4 L - E U E A .....                     | 3-5            |
| <b>Chapter 4 Performance Specification</b> .....  | <b>4-1-4</b>   |
| <b>2</b>  |                |
| 4 . 1     P e r f o r m a n c e     S p e c i f i c a t i o n .....                             | 4-1            |
| 4 . 2     C a b l e     S p e c i f i c a t i o n .....   | 4-2            |
| 4.2.1 Cable Standards related Ethernet/IEEE 802.3 .....   |                |
| 4 .....   | 2              |
| 4.2.2 An Example of Twisted-Pair Cable(UTP) of Category 5(CTP-LAN5) .....                       |                |
| 4 .....   | 2              |
| <b>Chapter 5 System Configuration</b> .....   | <b>5-1-5-7</b> |
| 5 . 1     G L O F A     P L C     N e t w o r k     S y s t e m .....                           | 5-1            |
| 5 . 2     G L O F A     P L C     E t h e r n e t     N e t w o r k     S y s t e m .....       | 5-2            |
| 5 . 3     G L O F A     P L C     E t h e r n e t     R e d u n d a n c y     S y s t e m ..... | 5-6            |

|   |                      |
|---|----------------------|
| <b>Chapter 6 Communication and Frame Editor</b> .....           | <b>6-1~6-8</b>       |
| 6 . 1      C o m m u n i c a t i o n   F u n c t i o n<br>..... | 6-1                  |
| 6 . 2      S e t u p      o f      P a r a m e t e r<br>.....   | 6-3                  |
| 6 . 2 . 1      F r a m e      E d i t o r<br>.....              | 6-3                  |
| <br><b>Chapter 7 High Speed Link</b> .....                      | <br><b>7-1~7-132</b> |
| 7 . 1      I n t r o d u c t i o n<br>.....                     | 7-1                  |
| 7 . 2      H i g h      S p e e d      L i n k<br>.....         | 7-2                  |
| 7.2.1 TX/RX Data Processing of High Speed Link<br>.....         | 7-2                  |
| 7.2.2 Operation Order by High Speed Link<br>.....               | 7-8                  |

|   |   |   |         |
|---|---|---|---------|
| 7.2.3 Setting High Speed Link Parameter .....                           |   |   |         |
| 7   | - | 1 | 0       |
| 7.2.4 Operation of High Speed Link .....                                |   |   |         |
| 7   | - | 1 | 8       |
| 7.2.5 High Speed Link Information .....                                 |   |   |         |
| . . . . .   |   |   | 7 - 2 0 |
| 7 . 2 . 6 S p e e d C a l c u l a t i o n o f H i g h S p e e d L i n k |   |   |         |
| .....   |   |   | 7-27    |
| 7.2.7 An Example of High Speed Link between Enet's .....                |   |   |         |
| 7   | - | 3 | 1       |
| 7 . 3 H i g h S p e e d L i n k o f R e d u n d a n t S y s t e m       |   |   |         |
| .....   |   |   | 7-36    |
| 7 . 3 . 1 I n t r o d u c t i o n                                       |   |   |         |
| .....   |   |   | 7-36    |
| 7 . 3 . 2 U s e o f H S _ L i n k                                       |   |   |         |
| .....   |   |   | 7-39    |
| 7.3.3 Example between Redundant CPU and GM3 for HS_Link .....           |   |   |         |
| 7   | - | 4 | 4       |

**Chapter 8 Function Block .....** **8-1-8-56**

|   |   |   |      |
|---|---|---|------|
| 8 . 1 I n t r o d u c t i o n   |   |   |      |
| .....   |   |   | 8-1  |
| 8 . 1 . 1 I n t r o d u c t i o n   |   |   |      |
| .....   |   |   | 8-1  |
| 8 . 1 . 2 K i n d a n d U s e o f F u n c t i o n B l o c k                       |   |   |      |
| .....   |   |   | 8-2  |
| 8 . 2 F r a m e S e t t i n g   |   |   |      |
| .....   |   |   | 8-17 |
| 8 . 2 . 1 F r a m e S e t t i n g   |   |   |      |
| .....   |   |   | 8-17 |
| 8 . 3 A p p l i c a t i o n P r o g r a m s                                       |   |   |      |
| .....   |   |   | 8-23 |
| 8.3.1 Example of Function Block Service between GLOFA Enet's .....                |   |   |      |
| 8   | - | 2 | 3    |
| 8.3.2 Enet module of other company + PC + GLOFA Enet .....                        |   |   |      |
| 8   | - | 3 | 3    |
| 8 . 4 F u n c t i o n B l o c k S e r v i c e o f R e d u n d a n c y S y s t e m |   |   |      |
| .....   |   |   | 8-40 |

|           |                                  |      |
|-----------|----------------------------------|------|
| 8 . 4 . 1 | I n t r o d u c t i o n          | 8-40 |
| 8.4.2     | Redundant Function Block Program | 8    |
| 8         | -                                | 4    |

**Chapter 9 GMWIN Communication ..... 9-1~9-12**

|       |  |     |
|-------|--|-----|
| 9 . 1 | I n t r o d u c t i o n  | 9-1 |
| 9 . 2 | G M W I N C o n n e c t i o n                                      | 9-2 |
| 9.2.1 | Remote 1 stage connection (If RS-232C cable used)                  | 9-3 |
| 9.2.2 | Remote 2 stage connection (If RS-232C cable used)                  | 9-6 |
| 9.2.3 | Remote 1 stage connection directly from PC connected with Ethernet | 8   |
| 9     | -  | 1   |
| 9.2.4 | Remote 2 stage connection directly from PC connected with Ethernet | 1   |

**Chapter 10 Dedicated Communication ..... 10-1~10-28**

|             |   |      |
|-------------|---|------|
| 1 0 . 1     | D e d i c a t e d C o m m u n i c a t i o n | 10-1 |
| 1 0 . 1 . 1 | S y s t e m C o n f i g u r a t i o n       | 10-1 |

|                   |                                       |                   |                   |                  |
|-------------------|---------------------------------------|-------------------|-------------------|------------------|
| 1 0 . 2           | D e s c r i p t i o n                 | o f               | f u n c t i o n s |                  |
| .....             |                                       |                   |                   | 10-3             |
| 1 0 . 2 . 1       | B a s i c                             | s e t t i n g     | o f               | f r a m e        |
| .....             |                                       |                   |                   | 10-3             |
| 1 0 . 2 . 2       | F r a m e                             | s t r u c t u r e |                   |                  |
| .....             |                                       |                   |                   | 10-4             |
| 1 0 . 2 . 3       | C o m m a n d s                       | l i s t           |                   |                  |
| .....             |                                       |                   |                   | 10-6             |
| 1 0 . 2 . 4       | D a t a                               | t y p e           |                   |                  |
| .....             |                                       |                   |                   | 10-6             |
| 1 0 . 3           | C o m m a n d                         | e x e c u t i o n |                   |                  |
| .....             |                                       |                   |                   | 10-8             |
| 10.3.1            | Separate Read of direct variables     |                   |                   |                  |
| 1                 | 0                                     | -                 |                   | 8                |
| 10.3.2            | Continual Read of direct variables    |                   |                   |                  |
| 1                 | 0                                     | -                 | 1                 | 3                |
| 10.3.3            | Named variables Read                  |                   |                   |                  |
| 1                 | 0                                     | -                 | 1                 | 5                |
| 10.3.4            | Separate Write of direct variables    |                   |                   |                  |
| 1                 | 0                                     | -                 | 1                 | 7                |
| 10.3.5            | Continual Write of direct variables   |                   |                   |                  |
| 1                 | 0                                     | -                 | 2                 | 0                |
| 10.3.6            | Named variables Write                 |                   |                   |                  |
| 1                 | 0                                     | -                 | 2                 | 2                |
| 10.3.7            | Status read request (MMI -> PLC)      |                   |                   |                  |
| 1                 | 0                                     | -                 | 2                 | 4                |
| <b>Chapter 11</b> | <b>Diagnosis function</b>             |                   |                   | <b>11-1~11-3</b> |
| 1 1 . 1           | D i a g n o s i s                     | F u n c t i o n   | b y               | O n l i n e      |
| .....             |                                       |                   |                   | M o d e          |
| .....             |                                       |                   |                   | 11-2             |
| 1 1 . 2           | D i a g n o s i s                     | F u n c t i o n   | b y               | T e s t          |
| .....             |                                       |                   |                   | M o d e          |
| .....             |                                       |                   |                   | 11-2             |
| <b>Chapter 12</b> | <b>Installation and Pre-operation</b> |                   |                   | <b>12-1~12-8</b> |
| 1 2 . 1           | I n s t a l l a t i o n               |                   |                   |                  |
| .....             |                                       |                   |                   | 12-1             |
| 12.1.1            | Precautions for installation          |                   |                   |                  |
| 1                 | 2                                     | -                 |                   | 1                |

|   |   |   |   |                   |
|---|---|---|---|-------------------|
| 12.1.2 Materials necessary for installation ..... | 1 | 2 | - | 1                 |
| 1 2 . 1 . 3 Installation of 10BASE5 .....         |   |   |   | 12-2              |
| 1 2 . 1 . 4 Installation of 10BASE2 .....         |   |   |   | 12-3              |
| 12.1.5 Installation of 10BASE-T .....             | 1 | 2 | - | 4                 |
| 1 2 . 2 Pre-Operation .....                       |   |   |   | 12-5              |
| 12.2.1 Precautions for system configuration ..... | 1 | 2 | - | 5                 |
| 12.2.2 Checklist prior to pre-operation .....     | 1 | 2 | - | 5                 |
| 1 2 . 3 Repair and Check .....                    |   |   |   | 12-7              |
| 1 2 . 3 . 1 Daily check .....                     |   |   |   | 12-7              |
| 1 2 . 3 . 2 Regular check .....                   |   |   |   | 12-8              |
| <b>Chapter 13 Troubleshooting .....</b>           |   |   |   | <b>13-1~13-15</b> |
| 1 3 . 1 Abnormal operation .....                  |   |   |   | 13-1              |

|   |         |                   |   |   |       |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|---|---------|-------------------|---|---|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|------|
| 1 | 3       | .                 | 2 | T   | r     | o | u | b | l | e | s | h | o | o | t | i | n | g | ..... | 13-3 |
|   | 13.2.1  | Error code E00-01 | : | H/W error                                 | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   |   |   |   |   |   |   |       | 3    |
|   | 13.2.2  | Error code E00-02 | : | Interface error                           | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   |   |   |   |   |   |   |       | 4    |
|   | 13.2.3  | Error code E01-01 | : | Network error                             | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   |   |   |   |   |   |   |       | 5    |
|   | 13.2.4  | Error code E02-01 | : | Interface error with CPU during operation | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   |   |   |   |   |   |   |       | 6    |
|   | 13.2.5  | Error code E03-01 | : | HS link parameter error                   | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   |   |   |   |   |   |   |       | 7    |
|   | 13.2.6  | Error code E03-02 | : | HS link operation error                   | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   |   |   |   |   |   |   |       | 8    |
|   | 13.2.7  | Error code E03-03 | : | HS link's Run link contact On unavailable | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   |   |   |   |   |   |   |       | 9    |
|   | 13.2.8  | Error code E03-04 | : | HS link trouble contact On                | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   | 1 |   |   |   |   |   |       | 0    |
|   | 13.2.9  | Error code E04-01 | : | E_CONN function block operation error     | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   | 1 |   |   |   |   |   |       | 1    |
|   | 13.2.10 | Error code E04-02 | : | TCP_SEND, UDP_SEND FB operation error     | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   | 1 |   |   |   |   |   |       | 2    |
|   | 13.2.11 | Error code E04-03 | : | TCP_RCV, UDP_RCV FB operation error       | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   | 1 |   |   |   |   |   |       | 3    |
|   | 13.2.12 | Error code E05-01 | : | GMWIN communication time-out occurred     | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   | 1 |   |   |   |   |   |       | 4    |
|   | 13.2.13 | Error code E05-02 | : | GMWIN inner communication error           | ..... |   |   |   |   |   |   |   |   |   |   |   |   |   |       |      |
|   | 1       |                   |   | 3   |       |   |   |   | - |   |   |   | 1 |   |   |   |   |   |       | 5    |

|                 |   |                |
|-----------------|---|----------------|
| <b>Appendix</b> | .....   | <b>A-1~A-6</b> |
| A 1             | L E D d i s p l a y s p e c i f i c a t i o n | ..... A-1      |
| A 2             | E x t e r n a l d i m e n s i o n s           | ..... A-2      |
| A 3             | E r r o r C o d e s                           | ..... A-4      |
| A.3.1           | Error received from communication modules     | ..... A-4      |

A . 3 . 2   S T A T U S   d i s p l a y e d   o n   C P U  
..... A-5