



**GU256X128C-3900**  
**GU256X128C-3900B**  
**Comparison Chart**

DOCUMENT NO. : E-M-0044-00  
DATE OF ISSUE : April 15, 2011  
REVISION :  
PUBLISHED BY : Noritake Co., Inc.

**Noritake Co., Inc.**

2635 Clearbrook Drive  
Arlington Height, IL 60005  
www.noritake-elec.com  
Phone: (800) 779 – 5846  
Fax: (847) 593 – 2285

**East Coast**

**New Jersey**  
(888) 296 – 3423

**Midwest, Canada,  
and Mexico**

**Chicago**  
(800) 779 – 5846

**West Coast**

**LA**  
(888) 795 – 3423

© 2011 Noritake Co., Inc. All rights reserved

GU256X128C-3900 GU256X128C-3900B comparison chart  
E-M-0044-00

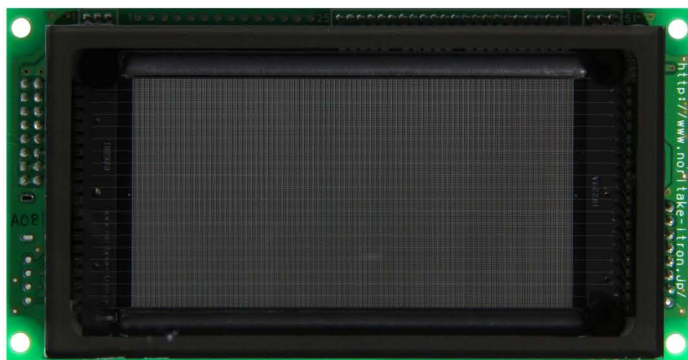
No part of this document may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, recording, or otherwise, without the prior written permission of Noritake Co., Inc.

The content of this document is furnished for informational use only, is subject to change without notice, and should not be construed as a commitment by Noritake Co., Inc. Noritake Co., Inc. assumes no responsibility or liability for any errors or inaccuracies that may appear in the informational content contained in this document. Please refer to the product specification for more detail.

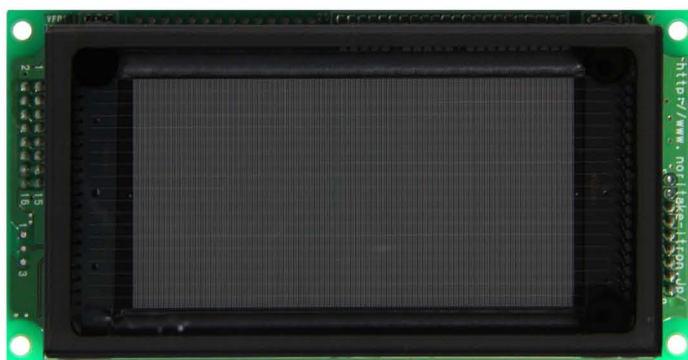
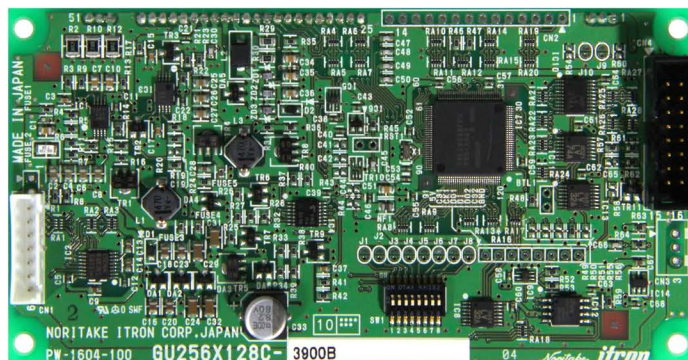
Any references to company names in this document are for demonstration purposes only and are not intended to refer to any actual organization.

Noritake and Itron are either registered trademarks or trademarks of Noritake Co., Inc. in the United States and/or other countries.

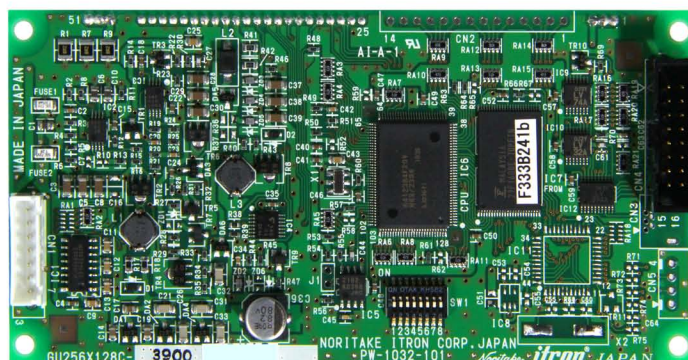
Noritake Co., Inc., 2635 Clearbrook Drive, Arlington Heights, IL 60005, USA.



**GU256X128C-3900B**



**GU256X128C-3900**



images are reference only and are not actual size

# Comparison Chart of VFD module

| Keynote                                                   |                                               | * Replacement Item                                                                                             |                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Changed                                                   |                                               | GU256X128C-3900                                                                                                | GU256X128C-3900B                                                                                                                                                                                                                                                                                                                       |
| Absolute Maximum                                          | Power Supply Voltage                          | -0.3 to +6.0 V                                                                                                 | Same as left                                                                                                                                                                                                                                                                                                                           |
|                                                           | Logic Supply Voltage - Parallel               | -0.3 to Vcc+0.3 V                                                                                              |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Logic Supply Voltage - Serial                 | -25 to +25 V                                                                                                   |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Logic Supply Voltage - I/O Port               | -0.3 to Vcc+0.3 V                                                                                              |                                                                                                                                                                                                                                                                                                                                        |
| Electrical Rating                                         | Power Supply                                  | 5V +/- 5%                                                                                                      | Same as left                                                                                                                                                                                                                                                                                                                           |
| Electrical Characteristics<br>(Parallel - CMOS level)     | Input Current                                 | IplH: Max 1.0 $\mu$ A<br>IplL: Max -200 $\mu$ A                                                                | Same as left                                                                                                                                                                                                                                                                                                                           |
|                                                           | Input Voltage                                 | VplH: 0.8Vcc to Vcc<br>VplL: 0 to 0.2Vcc                                                                       |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Output Voltage                                | VpOH: 3.5 to Vcc (IOH=-10 $\mu$ A)<br>VpOL: 0 to 0.6 V (IOL=4mA)                                               |                                                                                                                                                                                                                                                                                                                                        |
|                                                           |                                               |                                                                                                                |                                                                                                                                                                                                                                                                                                                                        |
| Electrical Characteristics<br>(Serial - RS232 level)      | Input Voltage                                 | VslH: 3 to 15 V<br>VslL: -15 to -3 V                                                                           | Same as left                                                                                                                                                                                                                                                                                                                           |
|                                                           | Output Voltage                                | VsOH: Min. 5 V (RL=3K $\Omega$ )<br>VsOL: Max. -5 V                                                            |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Input Impedence                               | 3 to 7 K $\Omega$                                                                                              |                                                                                                                                                                                                                                                                                                                                        |
| Electrical Characteristics<br>(General Purpose I/O Ports) | Input Current                                 | IilH: Max. 1 $\mu$ A<br>IilL: Max. -200 $\mu$ A                                                                | Same as left                                                                                                                                                                                                                                                                                                                           |
|                                                           | Input Voltage - Port 0                        | VilH: 2.0 to Vcc<br>VilL: 0 to 0.8 V                                                                           | VilH : <b>4.1 to Vcc</b><br>VilL : 0 to 0.8 V                                                                                                                                                                                                                                                                                          |
|                                                           | Input Voltage - Port 1                        | ViT-: Min. 1.0 V<br>ViT+ : Max. 0.7 Vcc<br>ViT+ - ViT-: Min. 0.4 V<br>(Schmidt Trigger input)                  | ViH : <b>4.1 to Vcc</b><br>VilL : <b>0 to 0.8 V</b><br>(Same as Port 0)                                                                                                                                                                                                                                                                |
|                                                           | Output Voltage                                | ViOH: Min. Vcc-0.6 V (IOH=-200 $\mu$ A)<br>ViOL: Max. 0.5 V (IOL=1.6 mA)                                       | Same as left                                                                                                                                                                                                                                                                                                                           |
|                                                           | Output Current (Per 1 terminal)               | IiOH: Max. 1.5 mA<br>IiOL: Max. 8 mA                                                                           |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Output Current (Per Sum of all I/Oterminal)   | IiOH: Max. 8 mA<br>IiOL: Max. 30 mA                                                                            |                                                                                                                                                                                                                                                                                                                                        |
|                                                           |                                               |                                                                                                                |                                                                                                                                                                                                                                                                                                                                        |
| Power Supply                                              | Power Supply Current 1<br>(All dots ON)       | Typical: 0.85 A<br>Max: 1.1 A                                                                                  | Same as left                                                                                                                                                                                                                                                                                                                           |
|                                                           | Power Supply Current 2<br>(All dots OFF)      | Typical: 0.68 A<br>Max: 0.89 A                                                                                 |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Power Supply Current 3<br>(Display power OFF) | Typical: 80 mA<br>Max: 120 mA                                                                                  | Typical: <b>70 mA</b><br>Max: 120 mA                                                                                                                                                                                                                                                                                                   |
|                                                           | Power Consumption<br>(All dots ON)            | Typical: 4.25 W<br>Max: 5.5 W                                                                                  | Same as left                                                                                                                                                                                                                                                                                                                           |
| Optical Specification                                     | Number of dots                                | 32,768 (256 X 128)                                                                                             | Same as left                                                                                                                                                                                                                                                                                                                           |
|                                                           | Display Area                                  | 83.08 mm x 41.48 mm                                                                                            |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Dot size                                      | 0.225 mm x 0.225 mm                                                                                            |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Dot pitch                                     | 0.325 mm x 0.325 mm                                                                                            |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Color & Brightness                            | Blue Green, 250 cd/m2 Min (500 cd/m2 Typ.)                                                                     |                                                                                                                                                                                                                                                                                                                                        |
| Environmental Condition                                   | Operating Temp.                               | -40 to + 85 Deg C                                                                                              | Same as left                                                                                                                                                                                                                                                                                                                           |
|                                                           | Storage Temp.                                 | -40 to + 85 Deg C                                                                                              |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Operating humidity                            | 20 to 80 % RH                                                                                                  |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Vibration                                     | 10 ~ 55 ~ 10 Hz (Frequency)<br>1.0 mm (Total Amplitude)<br>30 min (Duration)<br>X, Y, Z each direction         |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Shock                                         | 392 m/S^2 9 mS                                                                                                 |                                                                                                                                                                                                                                                                                                                                        |
| Interface                                                 | Type of interface                             | 8 Bit Parallel (C-MOS)<br>Serial (RS-232)<br>General Purpose I/O Port (GPIO)                                   | Same as left                                                                                                                                                                                                                                                                                                                           |
|                                                           | Serial (RS-232) Buffer Memory                 | Receive Buffer = 256 bytes<br>Transmit Buffer = 128 bytes                                                      |                                                                                                                                                                                                                                                                                                                                        |
|                                                           | RS-232 Communication Setting                  | Baud Rate 1: 38.4K bps (Default)<br>Baud Rate 2: 19.2K bps<br>Data Bit: 8<br>Start/Stop Bit: 1<br>Parity: None | Baud Rate 1: 38.4K bps (Default)<br>Baud Rate 2: 19.2K bps<br><b>Baud Rate 3: 4,800 bps</b><br><b>Baud Rate 4: 9,600 bps</b><br><b>Baud Rate 5: 57.6K bps</b><br><b>Baud Rate 6: 115K bps</b><br>Data Bit: 8<br>Start/Stop Bit: 1<br>Parity Setting 1: None (Default)<br><b>Parity Setting 2: Even</b><br><b>Parity Setting 3: Odd</b> |
|                                                           | Timing                                        | -                                                                                                              | Compatible                                                                                                                                                                                                                                                                                                                             |
|                                                           |                                               |                                                                                                                |                                                                                                                                                                                                                                                                                                                                        |

# Comparison Chart of VFD module

| Keynote              |                                        | * Replacement Item                                                                                                                                        |                                                                                                                                                                                        |
|----------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Changed              |                                        | GU256X128C-3900                                                                                                                                           | GU256X128C-3900B                                                                                                                                                                       |
| External Setting     | Dip Switch                             | 1 - 4: Display address select<br>5: Baud rate select<br>6: Command mode select<br>7: Operating mode select<br>8: Protocol select                          | 1 - 4: Display address select<br>5: <b>RS-232 interface setting</b><br>6: Command mode select<br>7: Operating mode select<br>8: Protocol select                                        |
| Memory               | Display Memory                         | 8,192 bytes (512X128 dots)                                                                                                                                | Same as left                                                                                                                                                                           |
|                      | Bit Image Memory - RAM                 | 1,028 bytes                                                                                                                                               | 4,096 bytes                                                                                                                                                                            |
|                      | Bit Image Memory - FROM                | 32,768 bytes                                                                                                                                              | Same as left                                                                                                                                                                           |
|                      | Bit Image Memory - FROM Extension      | 262,144 bytes                                                                                                                                             | Same as left                                                                                                                                                                           |
|                      | Macro Memory - RAM                     | 256 bytes                                                                                                                                                 | 16K bytes                                                                                                                                                                              |
|                      | Macro Memory - FROM                    | 16K bytes (4K X 4 Channels)                                                                                                                               | Same as left                                                                                                                                                                           |
|                      | General Purpose Memory - RAM           | N/A                                                                                                                                                       | 1,024 bytes                                                                                                                                                                            |
|                      | General Purpose Memory - FROM          | N/A                                                                                                                                                       | 64K bytes (4K X 16 Channels)                                                                                                                                                           |
| Character            | Available Caharacter Codes (Font Size) | ASCII + International (6x8, 8x16, 16x32)<br>Japanese Kanji (16x16)<br>Simplified Chinese (16x16)<br>Traditional Chinese (16x16)<br>Korean (16x16)         | ASCII + International (6x8, 8x16, <b>12x24</b> , 16x32)<br>Japanese Kanji (16x16, <b>32x32</b> )<br>Simplified Chinese (16x16)<br>Traditional Chinese (16x16)<br>Korean (16x16)        |
|                      | User Definable Font - RAM              | Up to 16 Words<br>Available Font Size<br>1 byte code: 6x8, 8x16<br>2 bytes code: 16x16                                                                    | Up to 16 Words<br>Available Font Size<br>1 byte code: 6x8, 8x16, <b>12x24</b> , 16x32<br>2 bytes code: 16x16, <b>32x32</b>                                                             |
|                      | User Definable Font - FROM             | Up to 128 Words for 1 byte characters<br>Available Font Size: 6x8, 8x16, 16x32<br><br>Up to 16 Words for 2 bytes characters<br>Available Font Size: 16x16 | Up to 128 Words for 1 byte characters<br>Available Font Size: 6x8, 8x16, <b>12x24</b> , 16x32<br><br>Up to 16 Words for 2 bytes characters<br>Available Font Size: 16x16, <b>32x32</b> |
| Function             | Commands                               | See Command Comparison Chart                                                                                                                              |                                                                                                                                                                                        |
| Mechanical Dimension | Outline                                | 131.0 mm +/- 0.4 mm x 66.0 mm +/- 0.7 mm                                                                                                                  | Same as left                                                                                                                                                                           |
|                      | Mounting Holes                         | Horizontally :<br>125.0 mm +/- 0.35 mm<br>Vertically :<br>58.0 mm +/- 0.30 mm                                                                             |                                                                                                                                                                                        |
|                      | VFD Height                             | 12.9 mm +/- 1.0 mm (from the surface of PCB)                                                                                                              |                                                                                                                                                                                        |
|                      | Parts (components) Height              | Max. 10 mm (from the surface of PCB)                                                                                                                      |                                                                                                                                                                                        |

## Document Referenced:

GU256X128C-3xxx hardware spec. Rev.00 (Date: 10/1/10)  
GU256X128dot-39xx software spec. Rev.03 (Date: 1/16/09)  
GU256X128C-3900b hardware spec. Rev. 02 (Date: 03/03/11)  
GU-3900B series "General Function" Software Specification (Date: 10/27/10)

## Command Comparison Chart

### Key note

Changed Parameter

Added Command(s)

|                                    | Command name                          | Available In |          |
|------------------------------------|---------------------------------------|--------------|----------|
|                                    |                                       | GU-3900      | GU-3900B |
| Character Code                     | Character display                     | Yes          | Yes      |
| Control Code                       | Back Space                            | Yes          | Yes      |
|                                    | Horizontal Tab                        | Yes          | Yes      |
|                                    | Line feed                             | Yes          | Yes      |
|                                    | Home Position                         | Yes          | Yes      |
|                                    | Carriage Return                       | Yes          | Yes      |
|                                    | Display Clear                         | Yes          | Yes      |
|                                    | Line Clear                            | -            | Yes      |
|                                    | Line end clear                        | -            | Yes      |
| General Setting Commands           | Brightness level setting              | Yes          | Yes      |
|                                    | Initialize Display                    | Yes          | Yes      |
|                                    | Cursor Set                            | Yes          | Yes      |
|                                    | Cursor display                        | Yes          | Yes      |
| Character Display Setting Commands | Write screen mode select              | Yes          | Yes      |
|                                    | International font set                | Yes          | Yes      |
|                                    | Character Table type                  | Yes          | Yes      |
|                                    | Over-Write mode                       | Yes          | Yes      |
|                                    | Vertical Scroll mode                  | Yes          | Yes      |
|                                    | Horizontal Scroll mode                | Yes          | Yes      |
|                                    | Horizontal scroll mode Scroll ON      | -            | Yes      |
|                                    | Horizontal Scroll speed               | Yes          | Yes      |
|                                    | Font size select                      | Yes          | Yes      |
|                                    | 2-byte Character                      | Yes          | Yes      |
|                                    | 2-byte character type                 | Yes          | Yes      |
|                                    | Font width                            | -            | Yes      |
|                                    | FROM extended font                    | -            | Yes      |
|                                    | Font magnification                    | Yes          | Yes      |
|                                    | Bold character                        | Yes          | Yes      |
| Display Action Setting Commands    | Wait                                  | Yes          | Yes      |
|                                    | Short Wait                            | Yes          | Yes      |
|                                    | Scroll display action                 | Yes          | Yes      |
|                                    | Blink                                 | Yes          | Yes      |
|                                    | Curtain display action                | Yes          | Yes      |
|                                    | Spring display action                 | Yes          | Yes      |
|                                    | Random display action                 | Yes          | Yes      |
|                                    | Display Power ON/OFF                  | Yes          |          |
|                                    | Display Power ON/OFF + AUTO-OFF       | -            | Yes      |
| Bit Image Display Setting Commands | Display power auto-OFF time           | -            | Yes      |
|                                    | Dot drawing                           | Yes          | Yes      |
|                                    | Line/Box pattern drawing              | Yes          | Yes      |
|                                    | Dot unit downloaded bit image display | -            | Yes      |
|                                    | Dot unit real-time bit image display  | -            | Yes      |
|                                    | Dot unit character display            | -            | Yes      |
|                                    | Real-time bit image display           | Yes          | Yes      |
|                                    | RAM bit image definition              | Yes          | Yes      |
|                                    | F-ROM bit image definition            | Yes          | Yes      |
|                                    | Download bit image display            | Yes          | Yes      |
|                                    | Downloaded bit image scroll display   | Yes          | Yes      |

## Command Comparison Chart

### Key note

Changed Parameter

Added Command(s)

|                                           | Command name                             | Available In |          |
|-------------------------------------------|------------------------------------------|--------------|----------|
|                                           |                                          | GU-3900      | GU-3900B |
| General Display Setting Commands          | Horizontal scroll display quality select | Yes          | Yes      |
|                                           | Reverse display                          | Yes          | Yes      |
|                                           | Write mixture display mode               | Yes          | Yes      |
| Window Display Setting Commands           | Window select                            | Yes          | Yes      |
|                                           | User Window definition or cancel         | Yes          | Yes      |
| Download Character Setting Commands       | Download character ON/OFF                | Yes          | Yes      |
|                                           | Download character definition            | Yes          | Yes      |
|                                           | Download character delete                | Yes          | Yes      |
|                                           | 16x16 Downloaded character definition    | Yes          | Yes      |
|                                           | 16x16 Downloaded character delete        | Yes          | Yes      |
|                                           | 32x32 Download character definition      | -            | Yes      |
|                                           | 32x32 Downloaded character delete        | -            | Yes      |
|                                           | Download character save                  | Yes          | Yes      |
|                                           | Download character restore               | Yes          | Yes      |
|                                           | FROM user font definition                | Yes          | Yes      |
|                                           | FROM extension font definition           | -            | Yes      |
| User Setup Mode Setting Commands          | User-Set up mode start                   | Yes          | Yes      |
|                                           | User-Set up mode end                     | Yes          | Yes      |
| General-Purpose I/O Port Control Commands | I/O ports "input/output" setting         | Yes          | Yes      |
|                                           | I/O port Output                          | Yes          | Yes      |
|                                           | I/O port Input                           | Yes          | Yes      |
| Macro Setting Commands                    | RAM macro define/delete                  | Yes          | Yes      |
|                                           | FROM macro define/delete                 | Yes          | Yes      |
|                                           | Macro execution                          | Yes          | Yes      |
|                                           | Macro end condition                      | -            | Yes      |
| Other Setting Commands                    | Memory SW setting                        | Yes          | Yes      |
|                                           | Memory SW data send                      | Yes          | Yes      |
|                                           | General-purpose memory store             | -            | Yes      |
|                                           | General-purpose memory transfer          | -            | Yes      |
|                                           | General-purpose memory send              | -            | Yes      |
|                                           | Display status send                      | Yes          | Yes      |
|                                           | RS-232 serial settings                   | -            | Yes      |
| DMA Mode                                  | Memory re-write mode                     | Yes          | Yes      |
|                                           | Bit image write                          | Yes          | Yes      |
|                                           | BOX Area Bit Image Write                 | Yes          | Yes      |
|                                           | Display start address                    | Yes          | Yes      |
|                                           | Display synchronous                      | Yes          | Yes      |
|                                           | Brightness level                         | Yes          | Yes      |

### Key note

| Added Command(s)                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------|
| <p>1. <b>Added Command(s):</b> <code>cd /usr/bin</code></p> <p>2. <b>Added Command(s):</b> <code>cd /usr/bin</code></p> |

| Command name                             | Available In |          | Code - Hex value |          |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
|------------------------------------------|--------------|----------|------------------|----------|----------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|---------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|--|--|
|                                          | GU-3900      | GU-3900B | 1st byte         | 2nd byte | 3rd byte | 4th byte                                                                                               | 5th byte                                              | 6th byte                                                                                  | 7th byte                                              | 8th byte                                                | 9th byte                                                      | 10th byte                                               | 11th byte | 12th byte | 13th byte | 14th byte | 15th byte | 16th byte | 17th byte                                               | 18th byte | 19th byte | 20th byte | 21th byte | 22th byte | 23th byte |  |  |
| Character display                        | Yes          | Yes      | 20 to FF         |          |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Back Space                               | Yes          | Yes      | 08               |          |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Horizontal Tab                           | Yes          | Yes      | 09               |          |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Line feed                                | Yes          | Yes      | 0A               |          |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Home Position                            | Yes          | Yes      | 0B               |          |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Carriage Return                          | Yes          | Yes      | 0D               |          |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Display Clear                            | Yes          | Yes      | 0C               |          |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Line Clear                               |              | Yes      | 18               |          |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Line end clear                           |              | Yes      | 19               |          |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Brightness level setting                 | Yes          | Yes      | 1F               | 58       | n        | (n=0 to 4 and 10h to 18h / 0=0%, 1=25%, 2=50%, 3=75%, 4=100%, 10h=0%, 11h=12.5%, 12h=25%,... 18h=100%) |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Initialize Display                       | Yes          | Yes      | 1B               | 40       |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Cursor Set                               | Yes          | Yes      | 1F               | 24       | xL       | xH                                                                                                     | yL                                                    | yH                                                                                        |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Cursor display                           | Yes          | Yes      | 1F               | 43       | n        |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Write screen mode select                 | Yes          | Yes      | 1F               | 28       | 77       | 10                                                                                                     | a                                                     |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| International font set                   | Yes          | Yes      | 1B               | 52       | n        |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Character Table type                     | Yes          | Yes      | 1B               | 74       | n        |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Over-Write mode                          | Yes          | Yes      | 1F               | 01       |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Vertical Scroll mode                     | Yes          | Yes      | 1F               | 02       |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Horizontal Scroll mode                   | Yes          | Yes      | 1F               | 03       |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Horizontal scroll mode Scroll ON         |              | Yes      | 1F               | 05       |          |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Horizontal Scroll speed                  | Yes          | Yes      | 1F               | 73       | n        |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Font size select                         | Yes          |          | 1F               | 28       | 67       | 01                                                                                                     | m                                                     | (m=1,2,4 / 1="6X8", 2="8X16", 4="16X32")                                                  |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
|                                          |              | Yes      | 1F               | 28       | 67       | 01                                                                                                     | m                                                     | (m=1,2,3,4 / 1="6X8", 2="8X16", 3="12X24", 4="16X32")                                     |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| 2-byte Character                         | Yes          | Yes      | 1F               | 28       | 67       | 02                                                                                                     | m                                                     | (m=0,1 / 1="Enable 2byte Char mode", 0="Disenable")                                       |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| 2-byte character type                    | Yes          | Yes      | 1F               | 28       | 67       | 03                                                                                                     | m                                                     | (m=0,1,2,3 / 0="Japanese", 1="Korean", 2="Simplified Chinese", 3="Traditional Chinese")   |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Font width                               |              | Yes      | 1F               | 28       | 67       | 04                                                                                                     | m                                                     | (m=1,2,3,4 / 1="Fixed width", 2="Proportional 1", 3="Proportional 2", 4="Proportional 3") |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| FROM extended font                       |              | Yes      | 1F               | 28       | 67       | 05                                                                                                     | n                                                     |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Font magnification                       | Yes          | Yes      | 1F               | 28       | 67       | 40                                                                                                     | x                                                     | y                                                                                         |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Bold character                           | Yes          | Yes      | 1F               | 28       | 67       | 41                                                                                                     | b                                                     |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Wait                                     | Yes          | Yes      | 1F               | 28       | 61       | 01                                                                                                     | t                                                     | (t= multiples of 0.5sec.)                                                                 |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Short Wait                               | Yes          | Yes      | 1F               | 28       | 61       | 02                                                                                                     | t                                                     | (t= multiples of time unit. See Time Unit Chart below.)                                   |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Scroll display action                    | Yes          | Yes      | 1F               | 28       | 61       | 10                                                                                                     | wL                                                    | wH                                                                                        | cL                                                    | cH                                                      | s                                                             | (s= multiples of time unit. See Time Unit Chart below.) |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Blink                                    | Yes          | Yes      | 1F               | 28       | 61       | 11                                                                                                     | p                                                     | tl                                                                                        | tz                                                    | c                                                       | (tl, tz = multiples of time unit. See Time Unit Chart below.) |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Curtain display action                   | Yes          | Yes      | 1F               | 28       | 61       | 12                                                                                                     | v                                                     | s                                                                                         | p                                                     | (s= multiples of time unit. See Time Unit Chart below.) |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Spring display action                    | Yes          | Yes      | 1F               | 28       | 61       | 13                                                                                                     | v                                                     | s                                                                                         | pL                                                    | pH                                                      | (s= multiples of time unit. See Time Unit Chart below.)       |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Random display action                    | Yes          | Yes      | 1F               | 28       | 61       | 14                                                                                                     | s                                                     | pL                                                                                        | pH                                                    | (s= multiples of time unit. See Time Unit Chart below.) |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Display Power ON/OFF                     | Yes          |          | 1F               | 28       | 61       | 40                                                                                                     | p                                                     | (p=0,1 / 0="Power OFF", 1="Power ON")                                                     |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Display Power ON/OFF/auto-off            |              | Yes      | 1F               | 28       | 61       | 40                                                                                                     | p                                                     | (p=0,1,10 / 0="Power OFF", 1="Power ON", 10="Power AUTO OFF")                             |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Display power auto-OFF time              |              | Yes      | 1F               | 28       | 61       | 40                                                                                                     | 11                                                    | t                                                                                         |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Dot drawing                              | Yes          | Yes      | 1F               | 28       | 64       | 10                                                                                                     | pen                                                   | xL                                                                                        | xH                                                    | yL                                                      | yH                                                            |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Line/Box pattern drawing                 | Yes          | Yes      | 1F               | 28       | 64       | 11                                                                                                     | mode                                                  | pen                                                                                       | x1L                                                   | x1H                                                     | y1L                                                           | y1H                                                     | x2L       | x2H       | y2L       | y2H       |           |           |                                                         |           |           |           |           |           |           |  |  |
| Dot unit downloaded bit image display    |              | Yes      | 1F               | 28       | 64       | 20                                                                                                     | xPL                                                   | xPH                                                                                       | yPL                                                   | yPH                                                     | m                                                             | aL                                                      | aH        | aE        | ySL       | ySH       | xOL       | xOH       | yOL                                                     | yOH       | xL        | xH        | yL        | yH        | 01        |  |  |
| Dot unit real-time bit image display     |              | Yes      | 1F               | 28       | 64       | 21                                                                                                     | xPL                                                   | xPH                                                                                       | yPL                                                   | yPH                                                     | m                                                             | xH                                                      | yL        |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Dot unit character display               |              | Yes      | 1F               | 28       | 64       | 30                                                                                                     | xPL                                                   | xPH                                                                                       | yPL                                                   | yPH                                                     | m                                                             | bLen                                                    | d(n)      |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Real-time bit image display              | Yes          | Yes      | 1F               | 28       | 66       | 11                                                                                                     | xL                                                    | xH                                                                                        | yL                                                    | yH                                                      | 01                                                            | d(n)                                                    |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| RAM bit image definition                 | Yes          | Yes      | 1F               | 28       | 66       | 01                                                                                                     | aL                                                    | aH                                                                                        | aE                                                    | sL                                                      | sH                                                            | sE                                                      | d(n)      |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| F-ROM bit image definition               | Yes          | Yes      | 1F               | 28       | 65       | 10                                                                                                     | aL                                                    | aH                                                                                        | aE                                                    | sL                                                      | sH                                                            | sE                                                      | d(n)      |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Download bit image display               | Yes          | Yes      | 1F               | 28       | 66       | 10                                                                                                     | m                                                     | aL                                                                                        | aH                                                    | aE                                                      | ySL                                                           | ySH                                                     | xL        | xH        | yL        | yH        | 01        |           |                                                         |           |           |           |           |           |           |  |  |
| Downloaded bit image scroll display      | Yes          |          | 1F               | 28       | 66       | 90                                                                                                     | m                                                     | aL                                                                                        | aH                                                    | aE                                                      | ySL                                                           | ySH                                                     | xL        | xH        | yL        | yH        | 01        | s         | (s= multiples of time unit. See Time Unit Chart below.) |           |           |           |           |           |           |  |  |
|                                          |              | Yes      | 1F               | 28       | 66       | 90                                                                                                     | m                                                     | aL                                                                                        | aH                                                    | aE                                                      | ySL                                                           | ySH                                                     | xL        | xH        | yL        | yH        | 01        | s         | (s= multiples of time unit. See Time Unit Chart below.) |           |           |           |           |           |           |  |  |
| Horizontal scroll display quality select | Yes          | Yes      | 1F               | 6D       | n        |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Reverse display                          | Yes          | Yes      | 1F               | 72       | n        |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Write mixture display mode               | Yes          | Yes      | 1F               | 77       | n        |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Window select                            | Yes          | Yes      | 1F               | 28       | 77       | 01                                                                                                     | a                                                     |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| User Window definition or cancel         | Yes          | Yes      | 1F               | 28       | 77       | 02                                                                                                     | a                                                     | b                                                                                         | xPL                                                   | xPH                                                     | yPL                                                           | yPH                                                     | xSL       | xSH       | ySL       | ySH       |           |           |                                                         |           |           |           |           |           |           |  |  |
| Download character ON/OFF                | Yes          | Yes      | 1B               | 25       | n        |                                                                                                        |                                                       |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Download character definition            | Yes          |          | 1B               | 26       | a        | c1                                                                                                     | c2                                                    | x(n)                                                                                      | (a=1,2 / 1="6X8", 2="8X16")                           |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
|                                          |              | Yes      | 1B               | 26       | a        | c1                                                                                                     | c2                                                    | x(n)                                                                                      | (a=1,2,3,4 / 1="6X8", 2="8X16", 3="12X24", 4="16X32") |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Download character delete                | Yes          |          | 1B               | 3F       | a        | c                                                                                                      | (a=1,2 / 1="6X8", 2="8X16")                           |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
|                                          |              | Yes      | 1B               | 3F       | a        | c                                                                                                      | (a=1,2,3,4 / 1="6X8", 2="8X16", 3="12X24", 4="16X32") |                                                                                           |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| 16x16 Downloaded character definition    | Yes          | Yes      | 1F               | 28       | 67       | 10                                                                                                     | c1                                                    | c2                                                                                        | d(n)                                                  |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| 16x16 Downloaded character delete        | Yes          | Yes      | 1F               | 28       | 67       | 11                                                                                                     | c1                                                    | c2                                                                                        |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| 32x32 Download character definition      |              | Yes      | 1F               | 28       | 67       | 14                                                                                                     | c1                                                    | c2                                                                                        | d(n)                                                  |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| 32x32 Downloaded character delete        |              | Yes      | 1F               | 28       | 67       | 15                                                                                                     | c1                                                    | c2                                                                                        |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |
| Download character save                  | Yes          |          | 1F               | 28       | 65       | 11                                                                                                     | a                                                     | (a=1,2,3 / 1="6X8", 2="8X16", 3="16X16")                                                  |                                                       |                                                         |                                                               |                                                         |           |           |           |           |           |           |                                                         |           |           |           |           |           |           |  |  |



Command Code Comparison Chart

Key note

|                   |
|-------------------|
| Changed Parameter |
| Added Command(s)  |

| Command name                     | Available In |          | Code - Hex value |          |          |          |          |                                                                                                 |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------------|--------------|----------|------------------|----------|----------|----------|----------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------|-----------|---------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|--|--|--|--|--|--|--|--|--|--|
|                                  | GU-3900      | GU-3900B | 1st byte         | 2nd byte | 3rd byte | 4th byte | 5th byte | 6th byte                                                                                        | 7th byte                                                                        | 8th byte | 9th byte                                                                   | 10th byte | 11th byte                                                     | 12th byte | 13th byte | 14th byte | 15th byte | 16th byte | 17th byte | 18th byte | 19th byte | 20th byte | 21th byte | 22th byte | 23th byte |  |  |  |  |  |  |  |  |  |  |  |
|                                  |              | Yes      | 1F               | 28       | 65       | 11       | a        | (a=1,2,3,4,5,6 / 1="6X8", 2="8X16", 3="16X16", 4="16X32", 5="32X32", 6="12X24")                 |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| Download character restore       | Yes          |          | 1F               | 28       | 65       | 21       | a        | (a=1,2,3 / 1="6X8", 2="8X16", 3="16X16")                                                        |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| FROM user font defintion         | Yes          |          | 1F               | 28       | 65       | 21       | a        | (a=1,2,3,4,5,6 / 1="6X8", 2="8X16", 3="16X16", 4="16X32", 5="32X32", 6="12X24")                 |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
|                                  |              | Yes      | 1F               | 28       | 65       | 13       | m        | P(80-1)                                                                                         | P(80-2)                                                                         | -P(ff-n) | (m=1,2,4 / 1="6X8", 2="8X16", 4="16X32" * 256x32, 256x64, 256x128, 320x32) |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| FROM extension font defintion    |              | Yes      | 1F               | 28       | 65       | 13       | m        | P(80-1)                                                                                         | P(80-2)                                                                         | -P(ff-n) | (m=1,2,3,4 / 1="6X8", 2="8X16", 3="12X24", 4="16X32")                      |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
|                                  |              | Yes      | 1F               | 28       | 65       | 15       | a        | b                                                                                               | p(n)                                                                            |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| User-Set up mode start           | Yes          | Yes      | 1F               | 28       | 65       | 01       | 49       | 4E                                                                                              |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| User-Set up mode end             | Yes          | Yes      | 1F               | 28       | 65       | 02       | 4F       | 55                                                                                              | 54                                                                              |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| I/O ports "input/output" setting | Yes          | Yes      | 1F               | 28       | 70       | 01       | n        | a                                                                                               |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| I/O port Output                  | Yes          | Yes      | 1F               | 28       | 70       | 10       | n        | a                                                                                               |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| I/O port Input                   | Yes          | Yes      | 1F               | 28       | 70       | 20       | n        |                                                                                                 |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| RAM macro define/delete          | Yes          | Yes      | 1F               | 3A       | pL       | pH       | d(n)     |                                                                                                 |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| FROM macro define/delete         | Yes          | Yes      | 1F               | 28       | 65       | 12       | a        | pL                                                                                              | pH                                                                              | t1       | t2                                                                         | d(n)      | (t1, t2 = multiples of time unit. See Time Unit Chart below.) |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| Macro execution                  | Yes          | Yes      | 1F               | 5E       | a        | t1       | t2       | (t1, t2 = multiples of time unit. See Time Unit Chart below.)                                   |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| Macro end condition              |              | Yes      | 1F               | 28       | 69       | 20       | a        | b                                                                                               | c                                                                               |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| Memory SW setting                | Yes          | Yes      | 1F               | 28       | 65       | 03       | a        | b                                                                                               |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| Memory SW data send              | Yes          | Yes      | 1F               | 28       | 65       | 04       | a        |                                                                                                 |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| General-purpose memory store     |              | Yes      | 1F               | 28       | 65       | 18       | sL       | sH                                                                                              | sE                                                                              | m1       | a1L                                                                        | a1H       | a1E                                                           | d(n)      |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| General-purpose memory transfer  |              | Yes      | 1F               | 28       | 65       | 19       | sL       | sH                                                                                              | sE                                                                              | m1       | a1L                                                                        | a1H       | a1E                                                           | m2        | a2L       | a2H       | a2E       |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| General-purpose memory send      |              | Yes      | 1F               | 28       | 65       | 28       | sL       | sH                                                                                              | sE                                                                              | m1       | a1L                                                                        | a1H       | a1E                                                           |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| Display status send              | Yes          | Yes      | 1F               | 28       | 65       | 40       | a        | b                                                                                               | c                                                                               |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| RS-232 serial settings           |              | Yes      | 1F               | 28       | 69       | 10       | a        | b                                                                                               | (a=0,1,2,3,4,5,6 \ 4800bps-115200bps b=0,1,2 \ 0: None parity, 1: Even, 2: Odd) |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| Memory re-write mode             | Yes          | Yes      | 1C               | 7C       | 4D       | D0       | 4D       | 4F                                                                                              | 44                                                                              | 45       | 49                                                                         | 4E        |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| DMA mode                         |              |          |                  |          |          |          |          |                                                                                                 |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| Bit image write                  | Yes          | Yes      | 02               | 44       | DAD      | 46       | aL       | aH                                                                                              | sL                                                                              | sH       | d(n)                                                                       |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| BOX Area Bit Image Write         | Yes          | Yes      | 02               | 44       | DAD      | 42       | aL       | aH                                                                                              | sXL                                                                             | sXH      | sYL                                                                        | sYH       | d(n)                                                          |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| Display start address            | Yes          | Yes      | 02               | 44       | DAD      | 53       | aL       | aH                                                                                              |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| Display synchronous              | Yes          | Yes      | 02               | 44       | DAD      | 57       | 01       |                                                                                                 |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |
| Brightness level                 | Yes          | Yes      | 02               | 44       | DAD      | 58       | n        | (n=0 to 4 and 10h / 0=0%, 1=25%, 2=50%, 3=75%, 4=100%, 10h=0%, 11h=12.5%, 12h=25%,... 18h=100%) |                                                                                 |          |                                                                            |           |                                                               |           |           |           |           |           |           |           |           |           |           |           |           |  |  |  |  |  |  |  |  |  |  |  |

| Time Unit Chart           | Timing unit +/-5% |       |
|---------------------------|-------------------|-------|
| Display Screen Resolution | 3900              | 3900B |
| 128x128                   | N/A               | 14 ms |
| 256x16                    | 14 ms             | 14 ms |
| 256x32                    | 14 ms             | 14 ms |
| 256x64                    | 14 ms             | 14 ms |
| 256x128                   | 16 ms             | 15 ms |
| 320x32                    | 14 ms             | 14 ms |
| 384x32                    | 13 ms             | 13 ms |
| 512x32                    | 14 ms             | 14 ms |

<- 128x128 is available in 3900B only.

Note: 256x16 does only have 6x8 and 8x16 character mode for 1 byte mode.

|                      |                                                                            |                                        |                                        |                                        |
|----------------------|----------------------------------------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| Document referenced: | GU-3900B series "General Function" Software Specification (Date: 10/27/10) |                                        |                                        |                                        |
|                      | GU256x128dot-39xx software spec. Rev.03                                    | GU256x32dot-39xx software spec. Rev.02 | GU320x32dot-39xx software spec. Rev.02 | GU512x32dot-39xx software spec. Rev.02 |
|                      | GU256x16dot-39xx software spec. Rev.02                                     | GU256x64dot-39xx software spec. Rev.02 | GU384x32dot-39xx software spec. Rev.02 |                                        |