WINCOR NIXDORF

BA63GV

Graphical Customer Display

Operating Manual

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Edition Aug 2008

Contents

Manufacturer's Declaration

This device fulfils the requirements of the EEC directives 2004/108/EC "Electromagnetic Compatibility"

FCC Class A Declaration

This equipment has been tested and found to comply with the limits for a

Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his expense. Modifications not authorized by the manufacturer may void user authority to operate this device. This class A digital apparatus complies with Canadian ICES-003.

Cet appareil numerique de la classe A est conforme à la norme NMB-003 du Canada.

Wincor Nixdorf International GmbH (WN) accepts no responsibility for radio and television reception interference resulting from unauthorized modifications to the equipment. Furthermore, neither cables nor devices which have not been approved for use by WN may be connected. The user shall be held responsible for interference caused in this manner.

Device repairs must be carried out by authorized personnel. All guarantee and liability claims are automatically excluded if repairs have been carried out by unauthorized personnel.

Tested Safety

The device has received the UL symbol and cUL symbol.

Note on Care

Wipe the customer display with a damp cloth as required. Solvents must not be used under any circumstances as they may damage the plastic.

Warranty

Wincor Nixdorf generally guarantees a limited warranty engagement for 12 months beginning with the date of delivery. This warranty engagement covers all those damages which occur despite a normal use of the product.

Damages because of

- improper or insufficient maintenance,
- improper use of the product or unauthorized modifications of the product,
- inadequate location or surroundings

they will not be covered by the warranty.

For details please consult your contract documents.

Recycling the BA63GV

Environmental protection does not begin when it is time to dispose of the BA63GV; it begins with the manufacturer. This product was designed according to our internal norm “Environmental conscious product design and development”.

The BA63 is manufactured without the use of CFCs und CCHS and is produced mainly from reusable components and materials.

The processed plastics can, for the most part, be recycled. Even the precious metals can be recovered, thus saving energy and costly raw materials.

Please do not stick labels onto plastic case parts. This would help us to re-use components and material.

At this time, there are still some parts that are not reusable. Wincor Nixdorf guarantees the environmentally safe disposal of these parts in a Recycling Center, which is certified pursuant to ISO 9001.

So don’t simply throw your BA63GV on the scrap heap when it has served its time, but take advantage of the environmentally smart, up-to-date recycling methods!

Please contact your competent branch office for information on how to return and re-use devices and disposable materials.

Overview

The BA63GV customer display is mainly used in POS installations that are designed in modular form. It is available in several forms: swivel based, pole-mounted or keyboard-mounted.

The display is a graphical vacuum florescent display (VFD) with a screen resolution of 256×64 pixels. It is capable of displaying 2 or 4 lines of up to 32 Latin characters per line. Besides the built-in ASCII character set, it also supports 2-byte character sets downloadable via software. The character resolution for the standard (1-byte code) character is 8×16 (W×H) pixels and, the 2-byte code character is 16×16 pixels

The device has the capability to display downloaded bitmap pictures. With this feature, user can display user-define image.

The display is connected to the point of sale system through a RS232C or USB interface. The power (12V DC) for the display is also supplied via this interface.

The following three mounting options of the display are available to meet individual installation requirements:

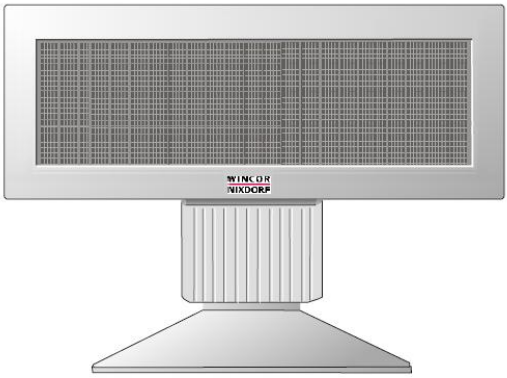


Figure 1 BA63GV on swivel base

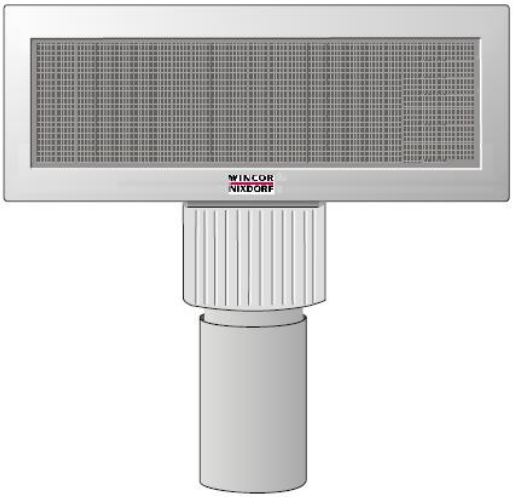


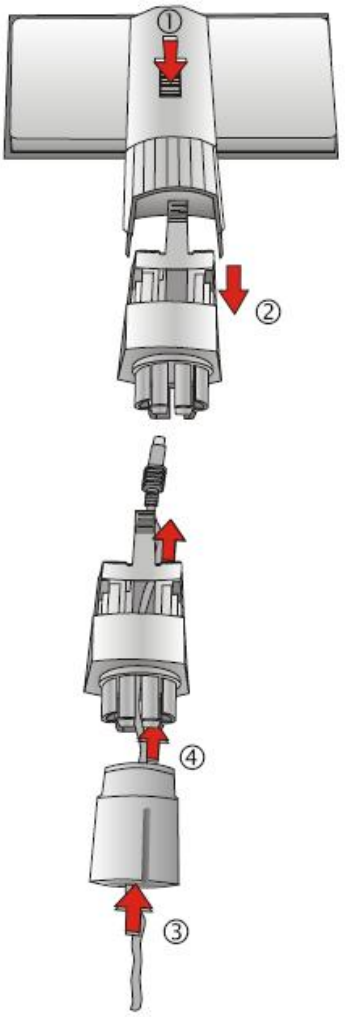
Figure 2 BA63GV pole-mounted

The tube diameter is 40 mm (+ 0.3 mm / - 0.1 mm). The tube is ordered separately.

The connection cables are available in different lengths. Cables have to be ordered separately and will be delivered separately.

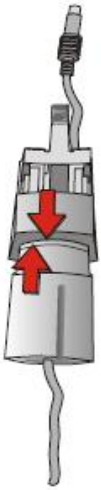
Cable Installation

For rod-mounted



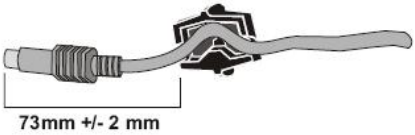
(1) Press the latch to release hinge.
(2) Disconnect the hinge from the device.

(3) Thread the cable through the adapter.
(4) And the through the hinge



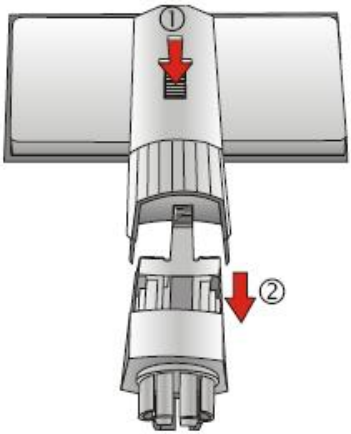
Connect the hinge and adapter together.

Secure the cable in the strain relief provided.

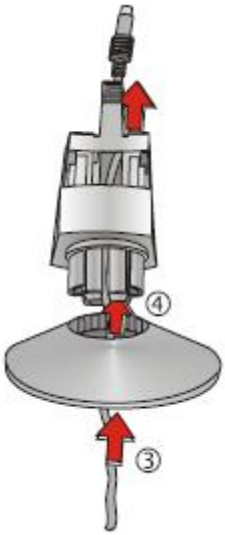


The distance between the strain relief and the tip of the connector must be 73 mm (+/- 2 mm)

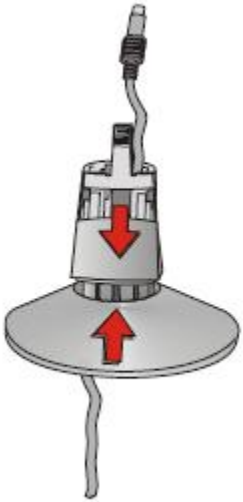
For Swivel base



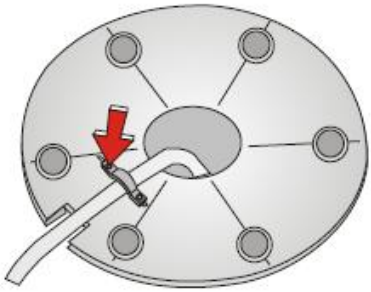
(1) Press the latch to release hinge.
(2) Disconnect the hinge from the customer display.



(3) Thread the cable through the adapter.
(4) And the through the hinge.



Connect the hinge to the base.



On the bottom side of the base, loosen one of the screws (see arrow) and rotate the cable clip about the other fastener. Guide the cable under the clip and shift the clip back to position. Tighten the screw.

Control Sequences

The customer display is controlled via software commands. The commands are entered with the appropriate ESC sequences. The following functions are available:

The BA63G customer display operates in VT100 mode, i.e. it emulates a subset of the VT100 ESC sequences and control bytes, plus vendor-specific commands.

VT100 Commands

Backspace (without deleting)	**BS**
Line feed	**LF**
Carriage return	**CR**
Delete display	**ESC[2J**
Position cursor	**ESC[Py;PxH**
Delete to end of line	**ESC[0K**

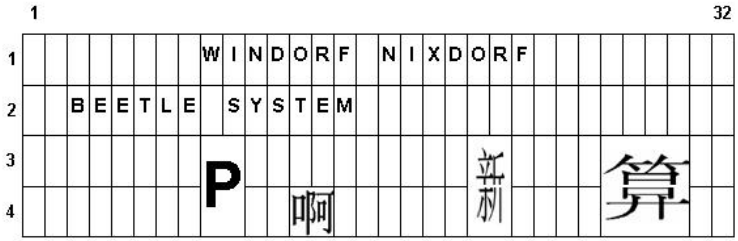
POS Commands

Set country code	**ESCRn**
Display identification	**ESC[0c**
Character set identification	**ESC[1c**
Firmware identification	**ESC[2c**
Set pixel position	**ESC[Px;Pyh**
Select display resolution	**ESC[nB**
Half dot enhancement on / off	**ESC[PxE**
Dump user defined picture to screen	**ESC[Py;PxD**
Setting clock	**ESC[hh;mmT**
Setting watch dog of cable monitor	**ESC[nnT**
Load user logo and set display monitor	**ESC[nnL**
Select line mode	**ESC[PxI**
Turn on / off display	**ESC[PxP**
Set baud rate for serial interface	**ESC[n;mS**

Screen Coordinates

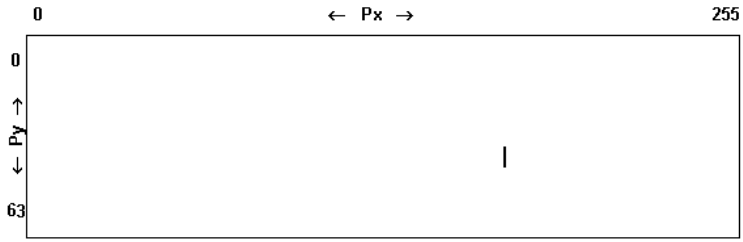
Text-mode

The display area is divided into 4 lines, of 32 Latin characters per line. The coordinate of the displayed characters are always with reference to the upper-left corner of the character.



Pixel-mode

In pixel-mode, the position is addressable by specifying x and y coordinates of the pixel.



Control codes and Command Description

This section describes the control code and escape commands supported by the device. Unless stated otherwise, all commands are common for both RS232C and USB interface.

Backspace (without deleting)

The **BS** command (hexadecimal 08) moves the cursor one space to the left. If there is a character in the position to which the cursor moves, it is not deleted. This command is ignored if the cursor is already at the first position of the line.

Line feed

The **LF** command (hexadecimal 0A) moves the invisible cursor down a line if it is positioned in one of the first three lines of the display. The column position of the cursor remains unchanged.

The position of the cursor remains unchanged if it is already in the last line. The contents of the screen are scrolled up one line and the last line is deleted.

Carriage return

The cursor is moved to the beginning of the line in which it is currently positioned when the **CR** command (hexadecimal 0D) is entered. The command is ignored if the cursor is already at the beginning of the line.

Clear Display

The display can be cleared with this ESC sequence. The cursor position remains unchanged. The ESC sequence is as follows:

Code	**Hexadecimal**
ESC [2 J	1B 5B 32 4A

Position cursor

The cursor position can be defined with this ESC sequence. The cursor is not visible on the display whilst this is being carried out. The following ESC sequence (for example) can be implemented:

Code	Hexadecimal
ESC [<Px>;<Py> H	1B 5B 31 3B 31 48

The parameters are transferred as ASCII characters and have the following meaning:

Parameter	Meaning
Py	Line number
Px	Column number

Example

If you select 0 for the parameter value, this is interpreted as 1 by the display. If, on the other hand, you select a value which is greater than the maximum line and column value, the display will interpret this value as the maximum value permitted.

The cursor is positioned in the first column of the first line if no parameter values are entered.

Note: This command is not applicable if the selected country code is Thai.

Delete to end of line

This command deletes the characters from the cursor, cursor position is included, to the end of the line. The position of the cursor remains unchanged.

The ESC sequence is as follows:

Code	Hexadecimal
ESC [0 K	1B 5B 30 4B

Set Country code

The following ESC sequence is implemented in order to select a country-specific character set:

Code	Hexadecimal
ESC R <n>	1B 52 *n*

The hexadecimal value n corresponds to the country code and defines the country-specific character set. The USA character set corresponds to the default setting.

Country code	Character set
00	USA
01	France
02	Germany
03	Great Britain
04	Denmark 1
05	Sweden
06	Italy
07	Spain 1
08	Japan
09	Norway
0A	Denmark 2
0B	Spain 2
0C	Latin America
63	Katakana

Country code	Character set
62	Korean 1-byte
80	Shift JIS
81	JIS
90	GB Jianti
91	GB Fanti
92	BIG 5
A0	Korean 2-byte
B0	Thai 4-level

The above character sets listed in the left table are standard character sets. Those character sets listed on the right table are optional character sets. They are available only when the specific character set is downloaded into the device.

Display identification

This command returns the display characteristics.

Code	Hexadecimal
ESC [0 c	1B 5B 30 63

Return string:

Response	Hexadecimal
ESC [? <p1>;<p2>;<p3>;<p4>;<p5> c	1B 5B 3F *p1*3B *p2* 3B *p3* 3B *p4* 3B *p5* 63

p1	Type of display	=	3	LCD display
p2	Firmware version	=	00	currently PROM version
			80	currently FLASH version
p3	Character set	=	2	modified IBM character set
p4	Number of lines	=	4	
p5	Column/line	=	32	

Character Set identification

This command returns the country code of the external character sets currently installed.

Code	Hexadecimal
ESC [1 c	1B 5B 31 63

Return string:

Response	Hexadecimal
ESC [? <p1>;<p2>; … ;<pn> c	1B 5B 3F *p1* 3B *p2* 3B … 3B *pn* 63

Where p1, p2, … pn are the country codes of the external character sets currently installed.

Firmware identification

This command returns the boot and main firmware version and subversion numbers.

Code	Hexadecimal
ESC [2 c	1B 5B 32 63

Return string:

Response	Hexadecimal
ESC [? <p1> <p2>;<p3> <p4> c	1B 5B 3F *p1 p2* 3B *p3 p4* 63

Where,
p1, p2 are the boot firmware version and subversion number.
p3, p4 are the main firmware version and subversion number.

Set Pixel position

This command returns the display characteristics.

Code	Hexadecimal
ESC [<x> ; <y> h	1B 5B *x* 3B *y* 68

Where,
x is the vertical position
y is the horizontal position

x and y are decimal numbers expressed as ASCII string.

Note: the origin (1, 1) is located at the top-lefttmost of the display.

Set Character Resolution

This command sets the character resolution. After sending this command, all characters sent will be displayed in the selected resolution.

Code	**Hexadecimal**
ESC [<n> B	1B 5B *n* 42

Where n is defined as:

n	Double Byte Characters Resolution (W×H)	Single Byte Characters Resolution (W×H)
0x30	16 × 16	8 × 16
0x31	16 × 32	8 × 32
0x32	32 × 32	16 × 32
0x33	16 x 20	8 x 20
0x34	32 x 20	16 x 20

Note: Default value for *n* is “0” (0x30).

Dump user-define image to display

This command allows application to display an image on the display. The screen has pixel lines each line has 256 pixels grouped in 8 to give a total of 32 bytes per pixel line. The origin of the image can be position vertical in pixel and horizontally in byte.

Code	**Hexadecimal**
ESC [<y> ; <x> D <w> <d> <data>	1B 5B *y* 3B *x* 44 *w d data*

Below illustrate the coordinate system for image dump.

1; 1	1; 2	....	....	....	1; 32
2; 1	2; 2	....	....	....	2; 32
:	:				:
:	:				:
:	:				:
64; 1	64; 2	....	....	....	64; 32

Set Clock

This command set the time for the internal clock. Once set, the display will maintain the time of a 24 hour clock. An image of a Beetle with blinking eyes will be displayed. This image will stay on the screen until a command or character is sent to the display.

Code	Hexadecimal
ESC [<hh ; <mm> T	1B 5B *hh* 3B *mm* 54

Set Watch Dog of cable monitor

This command defines the idle time period (no activities on the RS232 data lines) that will trigger the display of the Beetle clock.

Code	Hexadecimal
ESC [<mm> T	1B 5B *mm* 54

Load User Logo

This command loads the user-defined logo which will be displayed automatically when after the set idle time. The size user-defined logo must fill the entire screen.

Code	Hexadecimal
ESC [<nn> L <data>	1B 5B *nn* 54 *data*

Where,

nn = idle time period in minute

data = logo image (size = 64 x 32 bytes)

note: default value for *nn* is 0.

Set Line mode

Select 2-line, 3-line or 4-line mode.

Code	Hexadecimal
ESC [<n> I	1B 5B *n* 49

Where *n* is defined as:

0x30 = 4-line mode

0x31 = 2-line mode

0x32 = 3-line mode

Turn On/Off display

This command turns the display on or off.

Code	Hexadecimal
ESC [<n> P	1B 5B *n* 50

Where *n* is defined as:

0x30 = OFF

0x31 = ON

Set baud rate for serial port

This command turns the display on or off. This command is applicable to RS232C interface only.

Code	Hexadecimal
ESC [<n> ; <m> S	1B 5B *n* 3B *m* 53

n	Baud Rate
00	Auto-detection
01	110 bps
02	300 bps
03	600 bps
04	1200 bps
05	2400 bps
06	4800 bps
07	9600 bps (default)
08	14400 bps
09	19200 bps
0A	38400 bps
0B	56000 bps
0C	57600 bps
0D	115200 bps
0E	128000 bps ?
0F	256000 bps ?

m	Control Byte
1..0	00 = 5-bit data 01 = 6-bit data 10 = 7-bit data 11 = 8-bit data (default)
2	0 = 1 stop bit (default) 1 = 2 stop bits
3	0 = Disable parity 1 = Enable parity (default)
5..4	00 = Odd parity (default) 01 = Even parity 10 = Forced '1' stick parity 11 = Forced '0' stick parity
7..6	Fixed at 00

Commands for USB interface

For all the commands listed below the output report size is 32 bytes, and for the response the Input report size is 8 bytes. Pad bytes must be added to fill up the unused space.

Write Data Command

Data can be Escape sequences, control characters or data to be issued. Escape sequences can be "hacked up" (1st part in frame n, 2nd part in frame n+1).

Command: 02H, 00H, Data Count, Data Bytes

Response: 04H, status byte 1, status byte 2, status byte 3

Maximum length (size of output report) is 32 bytes. Maximum number of bytes in the data field is 32-3 = 29 bytes.

Read Configuration

Display identification

Command: 21H, 00H, 00H, .., 00H

Response: length, status byte 0, status byte 1, status byte 3,

"Pn1;Pn2;Pn3;Pn4;Pn5;Pn6;Pn7"

Where,

Pn1 = type of display

Pn2 = current code page

Pn3 = country code

Pn4 = number of lines

Pn5 = number of columns

Pn6 = Reserved (not used)

Pn7 = serial number (10 characters)

Reset Request

A reset will force a soft-reset and thus re-enumeration of the device.

Command: 00H, 40H, 00H, .., 00H

Response: None

Status Request

Status is requested.

Command: 00H, 20H, 00H, .., 00H

Response: 04H, status byte 1, status byte 2, status byte 3

Request self-test

A self test is performed.

Command: 00H, 10H, 00H, .., 00H

Response: 04H, status byte 1, status byte 2, status byte 3

Status Byte 1:	Bit 4...0	Ignore
	Bit 5	Hardware error
	Bit 6	Ignore
	Bit 7	Device not ready to received
Status Byte 2:	Bit 6...0	Ignore
	Bit 7	Undefined command
Status Byte 3:	Bit 7...0	ignore

Updating the Firmware

Both firmware and font can be updated via the RS232C or USB interface. Other then the pre-defined character sets, customer specific character set can be prepared upon request. When firmware or font updating is in progress, the device cannot work as a display.

A Window utility is provided to perform firmware and font updating.

Character Sets

Handling text and control sequence

Displayable Characters

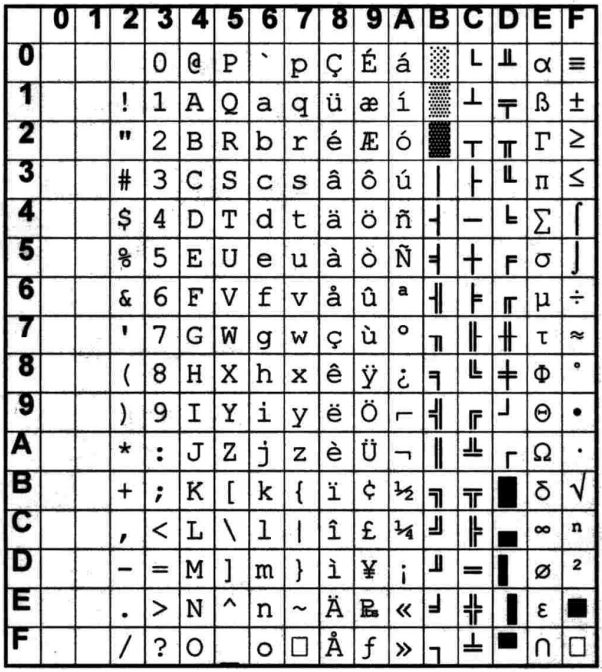
The characters are displayed at the current cursor position. The cursor is moved to the next available position after displaying the character. The distance moved is dependent on the resolution of the character. The character is displayed on the beginning of next line if it can not fit on the previous line, the screen will be scrolled up one line if this happens on the last line.

Undefined Characters and Control sequence

All characters which are not included in the defined character set and all ESC sequences which have not been defined for the device are ignored by the display. A blank is displayed when data corruption occurs.

Build in character set

IBM 437



International Characters

n	character set	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	USA	#	$	@	[	\	]	^	`	{	|	}	~
1	France	#	$	à	°	ç	§	^	`	é	ù	è	¨
2	Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3	UK	£	$	@	[	\	]	^	`	{	|	}	~
4	Denmark 1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
5	Sweden	#	P	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
7	Spain 1	Pt	$	@	¡	¡	¿	^	`	¨	ñ	}	~
8	Japan	#	$	@	[	¥	]	^	`	{	|	}	~
9	Norway	#	P	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10	Denmark 2	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11	Spain 2	#	$	à	¡	Ñ	¿	é	`	í	ñ	ó	ú
12	Latin America	#	$	à	¡	Ñ	¿	é	ü	í	ñ	ó	ú

Loadable Character Sets

Thai Character Set

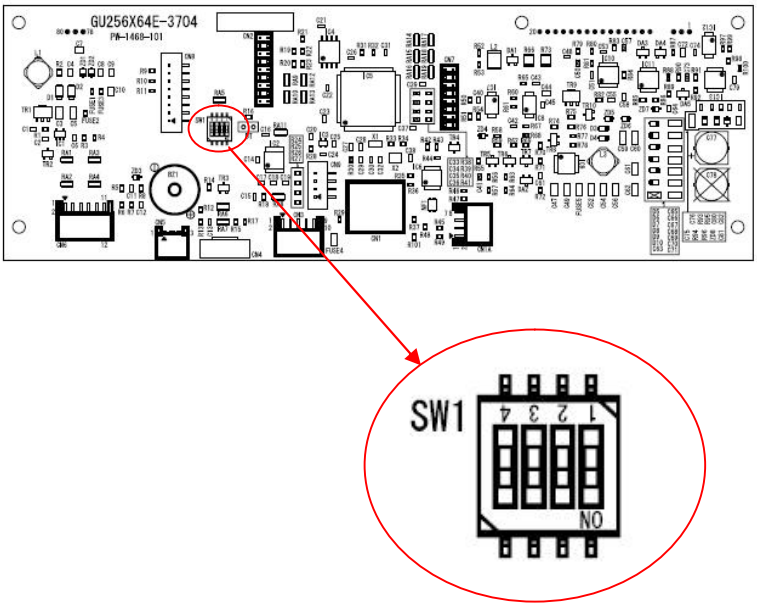
2-Byte Character Sets

The following table list the 2-byte character sets that are currently available.

font file name	Meaning
GBF1616.SNI	Chinese character set GB coded Fanti style (China)
GBJ1616.SNI	Chinese character set GB coded Jianti style (China)
BIG51616.SNI	Chinese character set BIG 5 coded Fanti style (Taiwan)
KOR0816.SNI	Korean character set one byte codes
KOR1616.SNI	Korean character set two byte codes
SJIS1616.SNI	Japan character set two byte codes Shift JIS coded

Configuring the Device

The device can be configured as a RS232C or USB interface by setting the DIP switches as shown in the drawing below:



Dip-switch (SW1)	S4	S3	S2	S1
RS232C	Off	Off	Off	Off
USB	Off	Off	Off	ON
Undefined	Off	Off	ON	Off
Undefined	Off	Off	ON	ON
Undefined	Off	ON	Off	Off
Undefined	Off	ON	Off	ON
Undefined	Off	ON	ON	Off
Undefined	Off	ON	ON	ON
Self-test	ON	Off	Off	Off

Technical Data

<table>
<tr><td>Display technology</td><td>Vacuum Fluorescence Display, 256x64</td></tr>
<tr><td>Character display</td><td>Character cell (W x H): 8x16 and 16x16
<table>
<tr><td></td><td>ASCII</td><td>DBCS</td><td>Thai</td></tr>
<tr><td>Height</td><td>6.60 mm</td><td>8.25 mm</td><td>10.45 mm</td></tr>
<tr><td>Width</td><td>3.85 mm</td><td>8.25 mm</td><td>4.40 mm</td></tr>
<tr><td>Row x Char</td><td>4 x 32</td><td>4 x 16</td><td>3 x 32</td></tr>
</table></td></tr>
<tr><td>Character set</td><td>Built-in: IBM437 + international characters
Optional downloadable character sets</td></tr>
<tr><td>Self-test function</td><td>Possible via software control and DIP switch</td></tr>
<tr><td>Interface</td><td>RS232C & USB 2.0</td></tr>
<tr><td>Transmission rate</td><td>RS232C – baud rate up to 115.2K
USB – Full speed, 12Mbps</td></tr>
<tr><td>Voltage supply</td><td>12V +/- 10 %, 800 mA (max)</td></tr>
<tr><td>Dimension</td><td>Height (with base): 165 mm
Width: 206 mm
Depth: 46 mm</td></tr>
<tr><td>Weight</td><td>0.5 kg</td></tr>
</table>

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