DIEBOLD NIXDORF

BA63GU-2

Graphical Customer Display

Operating Manual

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Edition June 2018

Contents

Manufacturer's Declaration

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

Therefore, you will find the CE mark on the rear side of the device or packaging.

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.

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.

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

Diebold 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.

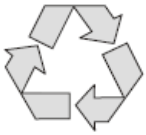
Damages because of

- 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 BA63GU



Environmental protection does not begin when it is time to dispose of the BA63GU; it begins with the manufacturer. This product was designed according to our internal norm “Environmental conscious product design and development”.

The BA63GU 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. Diebold 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 BA63GU 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 BA63GU customer display is mainly used in POS installations that are designed in modular form. It is available in several forms: swivel based, pole-mounted, keyboard-mounted as well as in the Fusion customer display housing.

The display is a STN Liquid Crystal Display with a screen resolution of 240×64 pixels. It is capable of displaying 2 or 4 lines of up to 30 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 has dual interfaces, RS232 and USB. It will operate as either RS232 or USB decided by the type of cable used to connect to the host.

Figure 1: BA63GU on swivel base

Figure 2: BA63GU pole-mounted

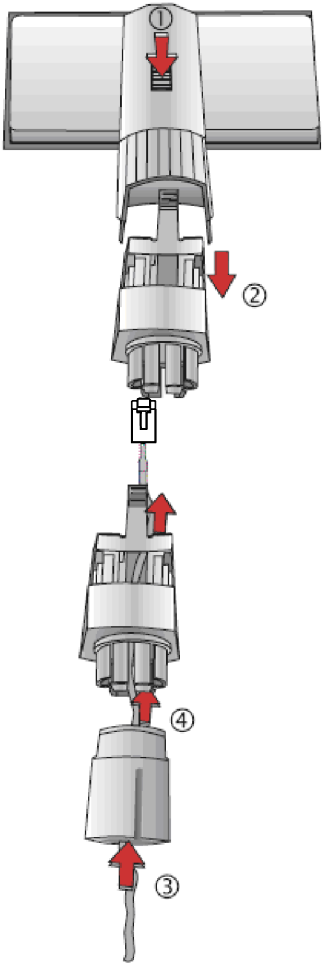
The tube diameter is 40 mm (+ 0.3 mm / - 0.1 mm). The tube is ordered separately.

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

Figure 3: BA63GU in Fusion customer display housing

Cable Installation

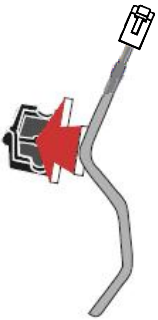
For rod-mounted



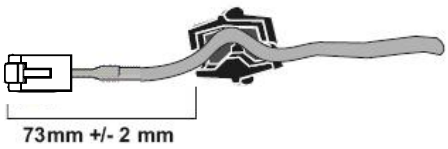
(1) Press the latch to release hinge.
(2) Disconnect the hinge from the device.

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

Connect the hinge and adapter together.

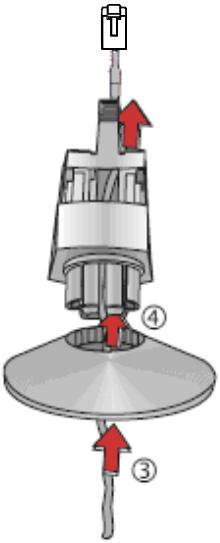


Secure the cable in the strain relief provided.



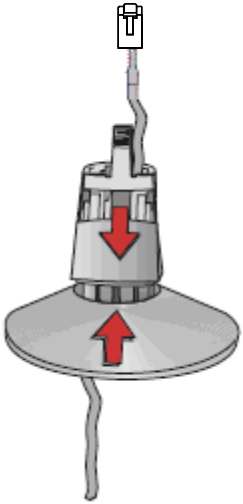
The distance between the strain relief and the tip of the connector must be 73 mm (+/- 2 mm)

For Swivel base

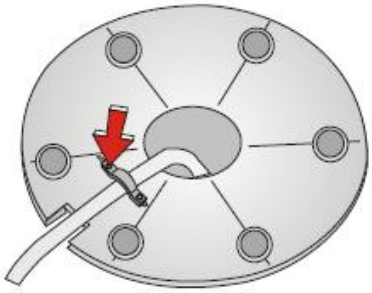


(1) Press the latch to release hinge.
(2) Disconnect the hinge from the customer display.

(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 BA63GU 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**
Clear Screen	**ESC[2J**
Position cursor	**ESC[*Py*;*Px*H**
Delete to end of line	**ESC[0K**

POS Commands

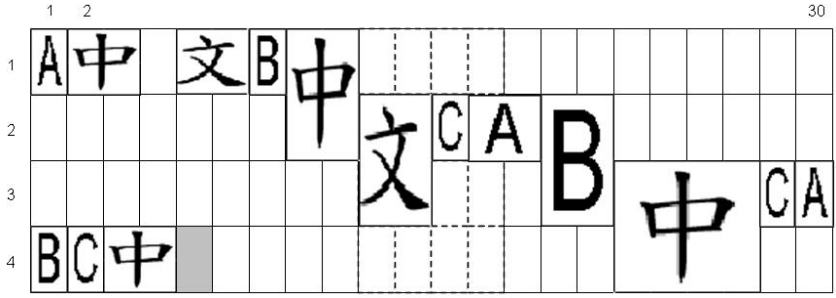
Set country code	**ESCR*n***
Display identification	**ESC[0c**
Character set identification	**ESC[1c**
Firmware identification	**ESC[2c**
Select display resolution	**ESC[*n*B**
Select Character Size	**ESC[*n*;*m*Z**
Dump user defined picture to screen	**ESC[*Py*;*Px*D**
Setting clock	**ESC[*hh*;*mm*T**
Setting watch dog of cable monitor	**ESC[*nn*T**
Load user logo and set display monitor	**ESC[*nn*L**
Select line mode	**ESC[*n*l**
Turn on / off display	**ESC[*n*P**
Set baud rate for serial interface	**ESC[*n*;*m*S**

Switch to BA63G Compatible Mode	**ESC[*n*E**
Read current Display Mode	**ESC[E**

Screen Coordinates

Normal Mode

The display area is divided into 4 lines, of 30 Latin characters per line. The coordinate of the displayed characters are always with reference to the upper-left corner of the character.



A double byte character or an enlarged single byte character occupies twice the width of a single byte character. The coordinate of such character refers to the upper-left corner of the character. Referring to the above example, the coordinates of the 3 different sizes, normal, double-height and double-width double-height, of the Chinese character '**中**' are (4; 3), (1; 8) and (3; 17) respectively.

Thai Mode

Thai character set contains standard ASCII characters in the lower range of the table from 0x20 to 0x7F and Thai characters in the upper range from 0x80 to 0xFF.

Thai characters are constructed by overlaying four layers consisting of consonants, vowel and tone marks. Application must always send a 4-byte sequence for each Thai character where the 1st byte refers to level 1, 2nd byte is level 2, etc. When the country code is set to Thai, character codes in the range from 80h to FFh are recognized as Thai elements. It is possible to mixed Thai characters and ASCII characters (20h to 7Fh) in a single display line.

Below table illustrates how the Thai character ป้ is formed:

	1st Byte	2nd Byte	3rd Byte	4th Byte
Value	E9h	A0h	BCh	D9h
Pattern	้	(blank)	ป	◌
Resultant Pattern	้	้	ป	ป้

The first byte is the tone mark or cancellation mark that appears at the top level. The code locations for this group are at E8h, E9h, EAh, EBh and ECh.

The second byte is the vowel that appears at the 2nd level. The code locations for this group are at D1h, D4h, D5h, D6h, D7h and E7h.

The third byte is the base character (consonant), and the fourth byte is the vowel located below the base character.

If a vowel or tone mark at a specific level is not present, it is replaced by a blank character (A0h).

If the character reaches the end of display line, the cursor coordinate does not automatically position itself to the next line.

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 Screen

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 [<*Py*>;<*Px*> 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

Country code	Character set
30	Standard
31	Latin 1
32	Latin 2
33	Latin 5 / Turkey
34	Latin 1 +€ char
35	Latin / Cyrillic
36	Latin Greek 2
37	Latin / Hebrew
38	Latin Greek 2
43	Arabic
62	Korean 1-byte
63	Katagana
80	Shift JIS
90	GB Jianti
92	BIG 5
93	BIG 5 + HK
A0	Korean 2-byte
B1	Thai 4-level (12x32)

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 type	=	80	*fixed*
p3	Character set	=	2	modified IBM character set
p4	Number of lines	=	4	
p5	Column/line	=	30	

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 [? <c*p1*>;<*cc1*>;<*cp2*>;<*cc2*> … ; <c*pn*>;<*ccn*> c	1B 5B 3F c*p1* 3B *cc1* 3B … 3B c*pn* 3B *ccn* 63

Where *cc1, cc2, … ccn* and *cp1, cp2, … cpn* are respectively the country codes and code pages 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. (Note: boot firmware version return is fixed as 00h 00h)
p3, *p4* are the main firmware version and subversion number.

Set Character Resolution

This command sets the character resolution. After sending this command, all characters sent will be displayed in the selected resolution. (Note: this command is for backward compatibility to BA63G)

The width of single byte character is half of the width of double byte character. When displaying double height character (i.e. n=1 or 2), a line feed command moves the cursor 2 lines down instead of 1 line. In this case, if the movement positions the cursor out of the screen, the device scrolls the whole screen 2 lines up and with the cursor remaining at the same location.

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

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

Set Character Size

This command set single or double width/height. Displayable characters sent after this command will be in the selected size. (Note: this command is for backward compatibility to BA63GV).

The width of single byte character is half of the width of double byte character. When displaying double height character (m=2), a line feed command moves the cursor 2 lines down instead of 1 line. In this case, if the movement positions the cursor out of the screen, the device scrolls the whole screen 2 lines up and with the cursor remaining at the same location.

Code	**Hexadecimal**
ESC [<*n*> ; < *m*> Z	1B 5B *n* ; *m* 5A

Where *n* is defined as:

n	m	Double Byte Characters Resolution (W×H)	Single Byte Characters Resolution (W×H)
0x31	0x31	16 × 16	8 × 16
0x31	0x32	16 × 32	8 × 32
0x32	0x31	32 × 16	16 × 16
0x32	0x32	32 x 32	16 x 32

Note: Default value for *n* and *m* is “1” (0x31).

Dump user-define image to display

This command allows application to display an image on the display. There are 240 pixels horizontally, each has 30 bytes each representing 8 pixels. The reference frame is at the upper left-corner of the display. The origin of the image can be positioned 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; 240
2; 1	2; 2	....	....	....	2; 240
:	:				:
:	:				:
:	:				:
8; 1	8; 2	....	....	....	8; 240

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 and Set Display Monitor

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* 4C *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 or 4-line mode.

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

Where *n* is defined as:

0x30 = 4-line mode

0x31 = 2-line mode

Default value is 0x30.

Turn On/Off display backlight

This command turns the display on or off. The backlight will automatically turn on if a command or displayable character is received when the backlight is currently turned 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

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

Set BA63G Compatible Mode

Select between BA63GU or BA63G Compatible Mode. The setting is saved in flash memory.

Code	Hexadecimal
ESC [<*n*> E	1B 5B *n* 45

Where *n* is defined as:

0x30 = BA63GU mode

0x31 = BA63G Compatible Mode

Default value is 0x30.

Read current Display Mode

This command returns the current display mode. The return data format is the same as the command for switching the mode.

Code	Hexadecimal
ESC [E	1B 5B 45
Return value	
ESC [n E	

Where *n* is defined as:

0x30 = BA63GU mode

0x31 = BA63G Compatible Mode

Default value is 0x30.

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 displayed. Data can be broken up and send in several frames. Maximum report length is 32 bytes.

Command:	00h, 02h, 00h, Data Count, xxh…xxh
	Data Count: length of data (w/o Data Count byte)
Response:	00h, 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 Display Identification

Command:	00h, 21h, 00h
Response:	00h, xxh, “Status byte 1”, “Status byte 2”, “Status byte 3”, "Pn1;Pn2;Pn3;Pn4;Pn5"

xx:	byte count
Pn1:	type of display (1 digit ASCII, e.g. "2")
Pn2:	actual code page (4 digits ASCII, e.g. "0852")
Pn3:	country code (2 digits ASCII, e.g. "02")
Pn4:	number of lines (1 digit ASCII, e.g. "2")
Pn5:	columns per line (2 digits ASCII, e.g. "20")
Pn6:	code page loaded in space page (4 digits ASCII, e.g. "0850")
Pn7:	serial number (x digits ASCII, e.g. "N000000001")

Read Character Sets

Command:	00h, 21h, 01h
Response:	00h, xxh, “Status byte 1”, “Status byte 2”, “Status byte 3”, "cp1;cc1;cp2;cc2;….cpn3;ccn" cp1: code page 1 cc1: country code 1 : cpn: code page n ccn: country code n

Reset Request

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

Command:	00h, 00h, 40h
Response:	none

Status Request

Command:	00h, 00h, 20h
Response:	00h, 04h, “Status byte 1”, “Status byte 2”, “Status byte 3”

Request self-test

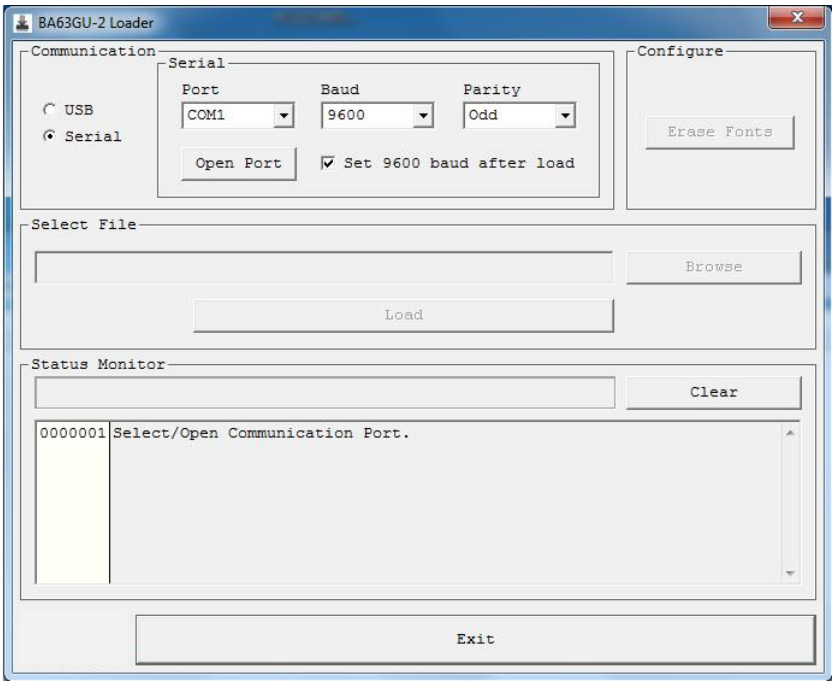
Command:	00h, 00h, 10h
Response:	00h, 04h, “Status byte 1”, “Status byte 2”, “Status byte 3”

Status Byte 1:	Bit 0	Flash download is in progress
	Bit 1…3	Error status 000 – No error 001 – Device received unexpected command 010 – File is not valid 011 – Device is unable to write to memory 100 – Device is unable to read from memory 101 – Programmed memory failed verification 110 – Vendor-specific error 111 – Unknown error
	Bit 4	Reserved (have to be zero)
	Bit 5	Hardware error
	Bit 6	Reserved (have to be zero)
	Bit 7	Device not ready to receive command
Status Byte 2:	Bit 0	Command complete
	Bit 1	Flash download is in progress
	Bit 2…4	Firmware Upgrading Status
	Bit 5	Reserved (have to be zero)
	Bit 6	Operation error
	Bit 7	Undefined command
Status Byte 3:	Bit 7...0	Reserved (all zero)

Firmware & Font Download

Both firmware and font can be updated via the RS232C or USB interface. When firmware or font updating is in progress, the device cannot function as a display until update is completed.

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 cannot fit on the previous line, the screen will be scrolled up one line if this happens on the last line.

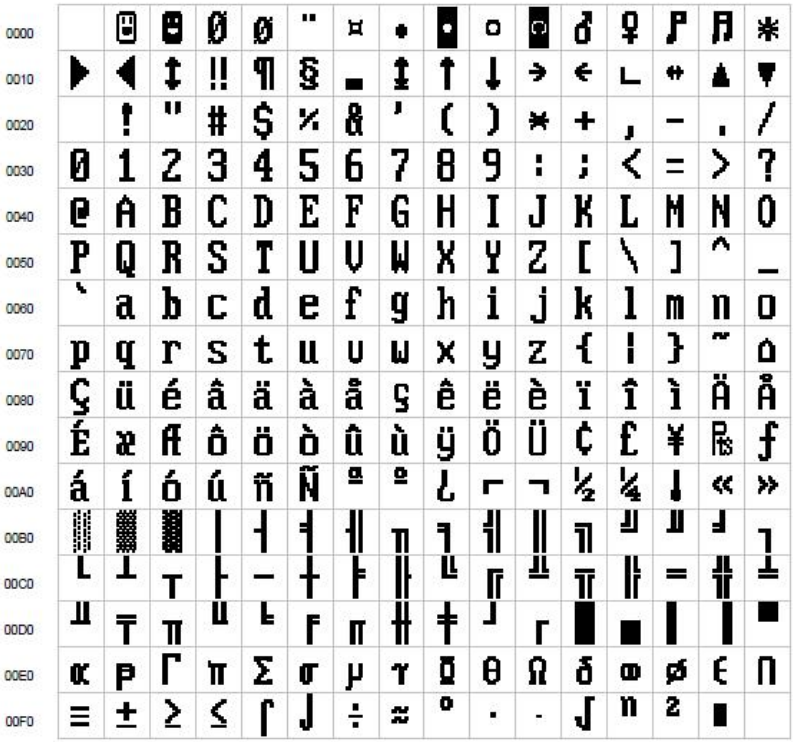
Undefined Characters and Control sequence

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.

Built-in Character Set

The device has a built-in IBM 437 ASCII character set plus the international characters shown below.

IBM 437



International Characters

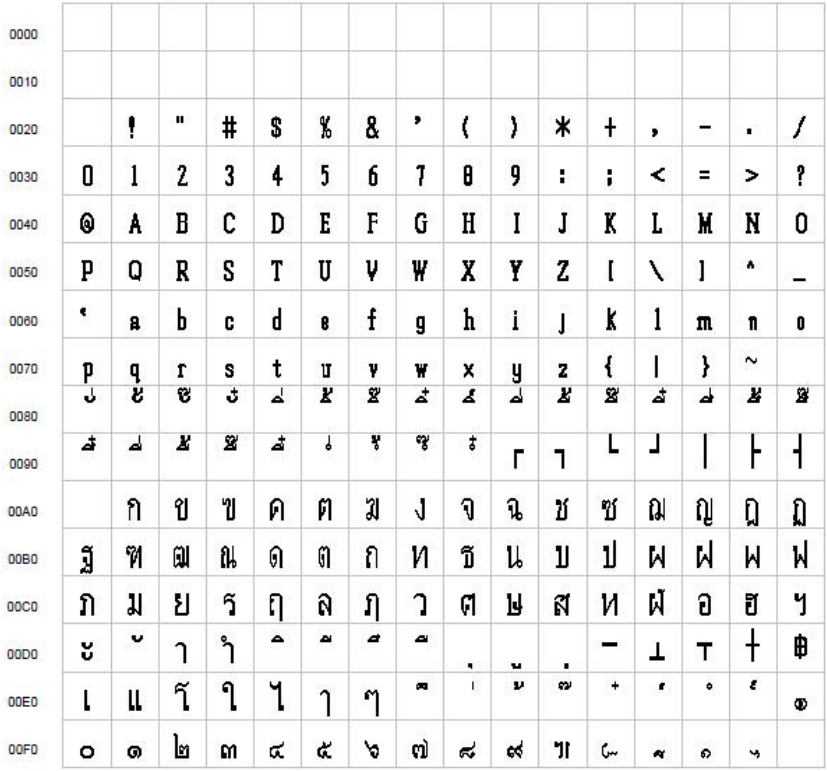
n	character set	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	USA	#	$	@	[	\	]	^	‘	{	|	}	~
1	France	#	$	à	•	ç	§	^	‘	é	ù	è	¨
2	Germany	#	$	§	Ä	Ö	Ü	^	‘	ä	ö	ü	ß
3	UK	£	$	@	[	\	]	^	‘	{	|	}	~
4	Denmark 1	#	$	@	Æ	Ø	Å	^	‘	æ	ø	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	$	@	•	\	é	^	ù	à	ò	è	ì
7	Spain 1	Pts	$	@	¡	Ñ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

Additionally, up to 8 external character sets can be loaded of which maximum one double-byte character set. The supported loadable character sets are shown in the table below.

Country Code	Code Page	Description	Character Size
30	437	Standard	8 x 16
31	850	Latin 1	8 x 16
32	852	Latin 2	- NA -
33	857	Latin 5/Turkey	8 x 16
34	858	Latin 1+ € char.	8 x 16
35	866	Latin/Cyrillic	8 x 16
36	737	Latin/Greek 2	8 x 16
37	862	Latin/Hebrew	8 x 16
38	813	Latin/Greek 2	8 x 16
43	1256	Arabic	16 x 16
63	897	Katakana	16 x 16
80	932	Shift JIS	16 x 16
90	936	GB Jianti	16 x 16
92	950	BIG 5	16 x 16
93	-	BIG 5+HK	16 x 16
A0	949	Korean 2-byte	16 x 16
B0	874	Thai 4-Levels (8x19)	8 x 19
B1	874	Thai 4-Levels (12x32)	12 x 32

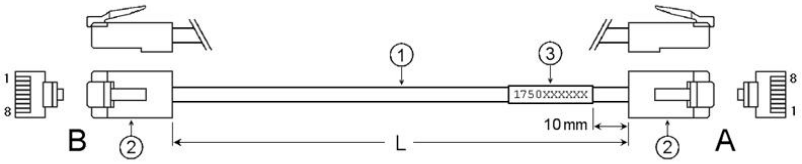
Thai Character Set



Configuring the Device

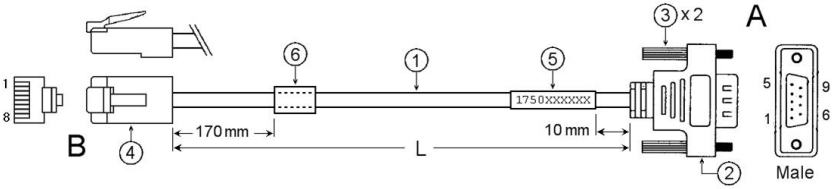
There are neither jumpers nor DIP switches on the device for configuration. Depending on the type of cable used, it can either operate as a serial or USB device.

Cable for Beetle /Fusion Customer Display

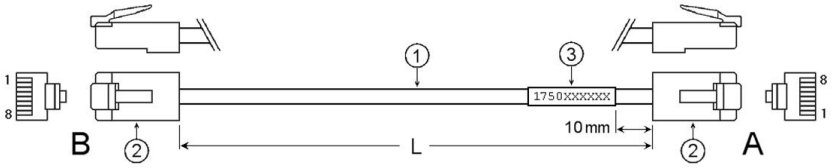


A	A-signal	Colour	AWG	B	
1	VBus	Red	26	1	
2	D-	White	28	2	Twisted pair
3	D+	Green	28	3	Twisted pair
4	Gnd	Black	26	4	
Shell	Shield	Shield+Drain	NA	Shell	

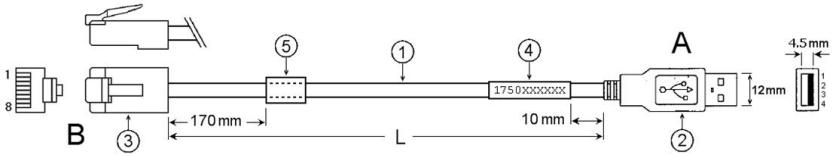
Cable options for Standalone Customer Display



A	A-signal	Colour	AWG	B	B-signal
2	RxD	Brown	28	6	TxD
3	TxD	Orange	28	5	RxD
5	Gnd	Black	24	4	Gnd
7	RTS	Purple	28	7	CTS
8	CTS	Grey	28	8	RTS
1	+12V	Red	24	1	Pwr-in
Shell	Shield	Shield+Drain	NA	Shell	Shield



A	A-signal	Colour	AWG	B	B-signal
1	+5V	Red	26	1	Pwr-in
5	TxD	Orange	28	5	RxD
6	RxD	Brown	28	6	TxD
4	Gnd	Black	26	4	Gnd
Shell	Shield	Shield+Drain	NA	Shell	Shield



A	A-signal	Colour	AWG	B	
1	VBus	Red	24	1	
2	D-	White	28	2	} Twisted pair
3	D+	Green	28	3	
4	Gnd	Black	24	4	
Shell	Shield	Shield+Drain	NA	Shell	

Technical Data

<table>
<tr><td>Display technology</td><td>Liquid Crystal Display, 240 x 64</td></tr>
<tr><td>Character display</td><td>
<table>
<tr><th>Character Cell</th><th>Size (mm)</th><th>Row x Col</th></tr>
<tr><td>8 x 16</td><td>4.24 x 8.48</td><td>4 x 30</td></tr>
<tr><td>16 x 16</td><td>8.48 x 8.48</td><td>4 x 15</td></tr>
<tr><td>8 x 19</td><td>4.24 x 10.07</td><td>3 x 30</td></tr>
<tr><td>12 x 32</td><td>6.36 x 16.96</td><td>2 x 20</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>By loopback (RS232 only) or command</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>Electrical Rating</td><td>USB: 5V +/- 5%, 500mA (max)
RS232C: 12V +/- 10%, 500mA (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>

Command Compatibility

		BA63G	BA63GU-1	BA63GU-2
Backspace	BS	✓	✓	✓
Line feed	LF	✓	✓	✓
Carriage return	CR	✓	✓	✓
Clear Screen	ESC[2J	✓	✓	✓
Position cursor	ESC[*Py*;*Px*H	✓	✓	✓
Delete to end of line	ESC[0K	✓	✓	✓
Set country code	ESCR*n*	✓	✓	✓
Display identification	ESC[0c	✓	✓	✓
Character set identification	ESC[1c	X	✓	✓
Firmware identification	ESC[2c	X	✓	✓
Select display resolution	ESC[*n*B	✓	✓	✓
Half dot enhancement on/ off	ESC[PxE	✓	X	X
Set Pixel Position	ESC[PxPxh	✓	X	X
Select Character Size	ESC[*n*;*m*Z	X	✓ note1	✓
Dump user defined picture to screen	ESC[*Py*;*Px*D	✓	✓	✓
Load user defined font	ESC[F ESC[U	✓	X	X
Setting clock	ESC[*hh*;*mm*T	✓	✓	✓
Setting watch dog of cable monitor	ESC[*nn*T	✓	✓	✓
Load user logo and set display monitor	ESC[*nn*L	✓	✓	✓
Select line mode	ESC[*n*I	✓	✓	✓
Turn on / off display	ESC[*n*P	✓	✓	✓
Set baud rate for serial interface	ESC[*n*;*m*S	X	✓	✓
Switch to BA63G Compatible Mode	ESC[*n*E	X	✓	✓
Read current Display Mode	ESC[E	X	✓	✓

LEGEND:
✓ SUPPORTED
X NOT SUPPORTED
NOTE 1

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