

BA63USB

BEETLE /FUSION Customer Display

Operating Manual

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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 numérique 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.

Tested Safety



The device has been provided with the symbol for “Tested Safety”.



The device has received the UL symbol and cUL symbol.

This product is intended to be Listed Accessory, supplied by a UL Listed product, POS Terminal model BEETLE series.

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.

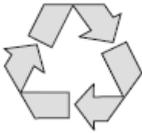
Damages because of

- 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 BA63USB



Environmental protection does not begin when it is time to dispose of the BA63USB; it begins with the manufacturer. This product was designed according to our internal norm “Environmental conscious product design and development”.

The BA63USB 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 BA63USB 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

This operating manual provides you with the information you require to install the BA63USB customer display unit onto the Beetle /Fusion system.

Symbols used in this guide

- Text following this mark represents an item in a list.
- “ “ Text in quotation marks contains references to other chapters or sections in this document.
- Paragraphs following this symbol are actions to be performed in the specific order.



Text following this symbol has to be given special attention in order to avoid damage or injury.



This symbol identifies paragraphs which contain general notes to facilitate use of the device and help avoid operating errors.

Important safety precautions



Please read the following notes carefully before doing any work on the device.

Installation notes

- When installing the device and/or doing any work on it, make sure that it is disconnected from the power.

General safety precautions

This device complies with the relevant safety regulations for information processing equipment.

- Note the warning and information labels on the device.
- The device is equipped with a safety-tested power cable, which must be connected only to a grounded outlet.
- Always hold the plug when removing the power cable. Never pull the cable itself.
- Have damaged power cables replaced immediately.
- If the display element is damaged and the liquid crystal solution leaks out onto your hands or clothing, please wash your hands or clothing immediately under running water for at least 15 minutes, using soap or alcohol. If the liquid comes into contact with your eyes, consult a medical doctor immediately.
- Make sure that there is always free access to sockets used or to the electrical circuit-breakers of the house installation.
- In case of an emergency (e.g. damaged cabinets, control or power cables, liquids or foreign objects in the device), switch off the device immediately and inform the customer service responsible for you.
- During the thunderstorm, data transmission lines must not be connected or disconnected.
- Only use accessories and extension components that have been approved by us. Nonobservance can result in damage to the system

or violations of regulations concerning safety, radio interference and ergonomical requirements.

- To clean the device only use cleaning agents approved by Diebold Nixdorf International GmbH.

Repairs



Repair work may only be carried out by authorized personnel.

Unauthorized opening of the device or repair work carried out improperly could result in considerable danger to the user.

In case of noncompliance Diebold Nixdorf International GmbH excludes all liability.

Installation

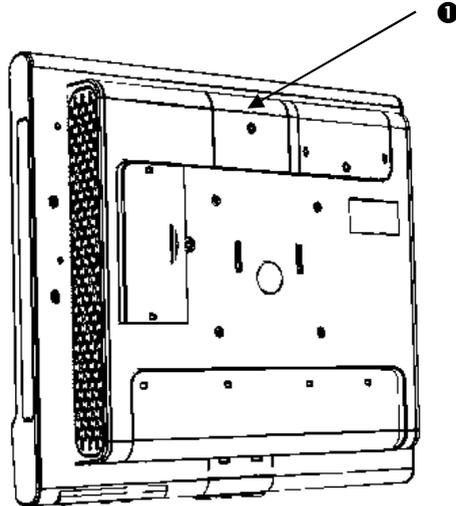
This chapter describes the steps to be taken to install the customer display unit onto the system.

Removing the packaging

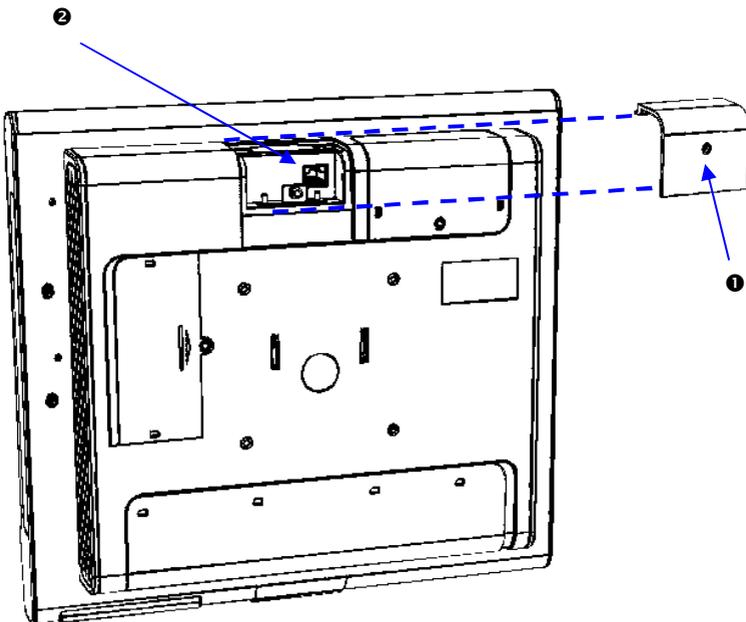
- Remove the packing material of the system or the modules ordered.
- Dispose of the packaging which is no longer needed according to the regulations of your country.

Installing customer display onto panel PC module

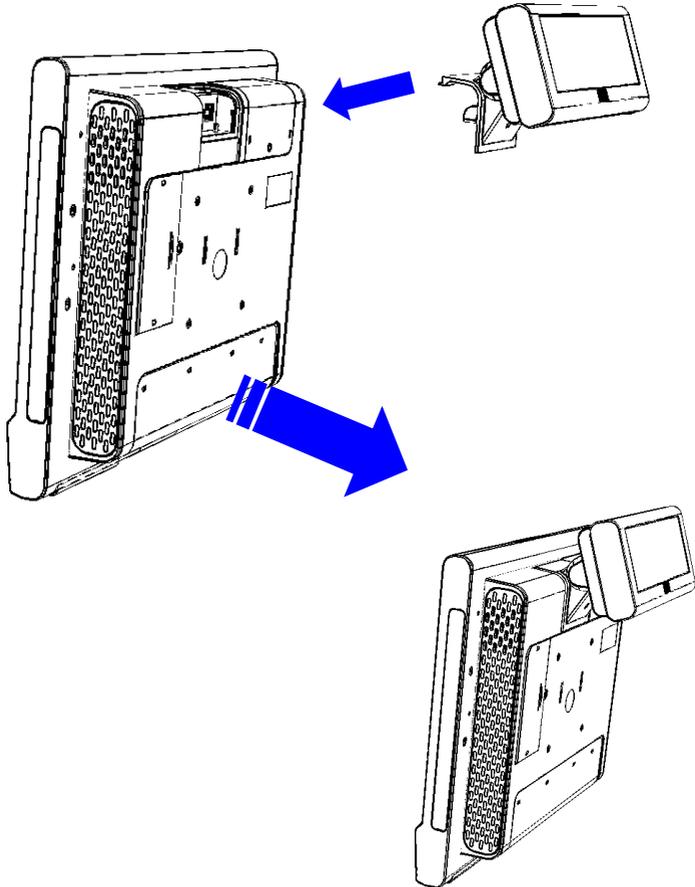
- Remove the screw ❶ to remove the cover from the panel PC (see picture below).



Remove the M3 nuts to detach the dummy bracket from the system and install the bracket that comes with customer display kit **1**, plug in the RJ45 connector from the customer display unit onto the connector slot of the panel PC **2** (see picture below).



- Ensure the mounting of the customer display unit is aligned with the mounting slot of the panel PC. Click the customer display unit onto the Panel PC and tighten the screw to secure the module (see picture below)



Customer Display Control

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

- The cursor can be moved to the desired position;
- The customer display can be deleted;
- The characters from the cursor to the end of the line can be deleted;
- An identification code can be requested;
- A self-test can be performed.

Control Sequences

The customer display operates in VT100 mode, i.e. it emulates a subset of the VT100 ESC sequences and control bytes. These are illustrated in the following:

Backspace (without deleting)	BS
Carriage return	CR
Delete display	ESC[2J
Position cursor	ESC[Px;PyH
Delete to end of line	ESC[0K
Set country code	ESCRn

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.

Delete display

The display can be deleted 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
<i>Py</i>	Line number
<i>Px</i>	Column number

Example

Replace the parameters with the following values if you wish to position the cursor at the very start of the first line:

ESC [1;1 H

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.

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 < <i>n</i> >	1B 52 <i>n</i>

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
63	Katagana
73	Space Page

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.

POS Commands

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

Length max. 32. That is the size of the report. Maximum of reference data to be transferred: 32-3 = 29 bytes, i.e. when configuring an Escape sequence "economically" for positioning, a line can be displayed with a Write Data Command.

Read Config Request

Display identification

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

Test Request

A self test is performed. This command causes no new enumeration.

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

Status Request

Status is requested.

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

Reset Request

A reset causes a new login and thus enumeration of the device with all sub-devices. Therefore, there is no corresponding response to the Reset Request.

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

Read Config Response

Response: Length Byte, Status Byte 0, Status Byte 1,
Status Byte2 (s. Status Response)
"Pn1;Pn2;Pn3;Pn4;Pn5;Pn6;Pn7"

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/line (2 digits ASCII, e.g. "20")

Pn6: code page loaded in Space-Page (4 digits ASCII, e.g. "0850")

Pn7: serial number (10 chars ASCII, e.g. "N000000001")



Pn6 rsp. Pn7 may be omitted in case the Space Page is empty or no serial number burnt into the device.

Parameters are not compatible to the response to the Escape sequence ESC [0 c of the displays BA63 and BA66 with RS232 interface. The firmware version is not specified here but in the corresponding descriptor.

Test Response

Response: 04H, Status Byte 0, Status Byte 1, Status Byte 2
Status Bytes: s. Status Response

Status Response

Response: 04H, Status Byte 0, Status Byte 1, Status Byte 2

Status Byte 0:

Bit 0..4	ignore
Bit 5	Hardware Error
Bit 6	ignore
Bit 7	Device not ready to receive commands

Status Byte 1:	
Bit 0..6	ignore
Bit 7	Undefined command received (command reject)
Status Byte 2:	
Bit 0..7	ignore

Updating the Firmware

The firmware as well as the character set can be programmed via the USB interface. Thus, updates, customer specific character sets or firmware can be newly arranged. During an updating operation the device will not work as display.

Updating the firmware (including the standard character sets) or the space page can be done by using the **WNUpdHID.exe** file. There is no need for additional hardware (see also next page).

The utility WNUpdHID.exe can be used to perform a firmware update or a character table update. In the following the reference is to firmware update, as this is more critical than just performing a character table update.

WNUpdHID.exe requires the WNHidHlp.dll to run. It is recommendable to have the DLL and the executable file in the same directory. In the dialog of the firmware update utility you specify the type of device, for which a firmware update should be done. For the BA63 USB a selection

- BA63
- Nonspecific (virgin device)

is relevant.

Roughly the BA63 USB software can be divided into a loader and a firmware. The selection "BA63" is for a case, where the BA63 USB already has a firmware and therefore knows "which type of device it is". If there is no firmware at all, i.e. just the loader, only "Nonspecific" can be used.

"Nonspecific" also may be used in case something went wrong during the update, i.e. it serves as a fallback. Note, if "Nonspecific" is chosen, there must not be any other firmware updatable HID devices! There is a file browsing facility to select the firmware file for update. It should have a .DAT extension. After both the device type and the firmware file are selected, the download can be started. It takes some time until the update actually starts, as the device does a reenumeration. Please wait for the enumeration to finish! When the update starts, you will see a progress bar. If the update was successful, you will get a message and you will see the BA63 performing a reset and showing the actual versions of the loader and firmware. If something went wrong, you may get messages like

- "Command reject"

- "Operation in error"
- "Device not found"
- "Command reject" may occur, if the firmware update file is not for this type of device.
- "Operation in error" may occur in case of a hardware failure, e.g. no successful flashing, therefore, a retry is performed in this case.
- "Device not found" may have the reason that the BA63 is not connected to the system. In this case check the cable. Another reason may be that something went wrong during flashing and from the system point of view the device no longer looks like a BA63. In such a case you may try the selection "Nonspecific (virgin device)" rather than BA63 for another update. Note, that the BA63 normally offers two interfaces to the system:

'line display' interface --> corresponds to BA63

'firmware update' interface --> corresponds to Nonspecific (virgin device)

When a firmware update is started, the BA63 clears the firmware and reenumerates to just having a 'firmware update' interface. Then the firmware update is performed and when finished, the BA63 again performs a reset and reenumerates to having a 'line display' and 'firmware update' interface, if the update was OK. If something went wrong, still only the 'firmware update' interface is presented. Therefore, the selection "Nonspecific (virgin device)" serves as a fallback, if anything got wrong during an update performed before. The **About button** may be used to get the software version.

Please finish the update utility by pressing the **Exit button**.

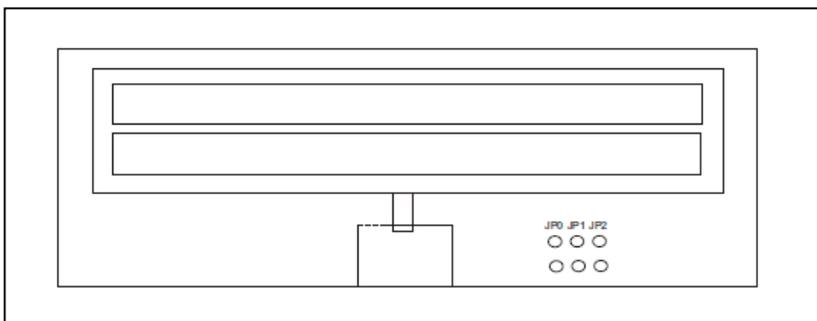
System Connection

The system is connected via a USB 1.1 interface. Changes of operating mode or rate of transmission are not possible. A connection to a USB 2.0 port is possible. In this case a cable released by Diebold Nixdorf must be used.

On the front of the module the following jumpers can be accessed:

Jumper	ON/OFF	Function	Default
JP0	ON	Self test	OFF
JP1	ON	Font test	OFF
JP2	ON	Manual Upgrade	OFF

The illustration below shows the position of the jumpers. The screen can be removed by pressing the two clips of the housing, underneath the screen. Thus the jumpers are accessible. Jumpers can be set by using pointed tweezers or paper-clips. Even a crosswise setting of the jumpers will not lead to damage of the display circuitry. If one of the jumpers is set to ON the BA63 can not be operated in display mode.



Customer display circuitry

Test Functions

The internal RAM of the processor and the EPROM are tested during the start-up phase. If no errors are detected during the test and the BA63 was initialized and attached as a USB device by the operating system, a start-up message will be displayed for approx. 1.5 seconds. The display remains blank if an error is detected.

Test by short-circuiting J0

Same self test in series as entering the ESC sequence ESC [0c and ESC [?2;nn;2;2;20c. As long as the jumper J0 is set to ON the test will be performed as closed loop. See also page 21.

Test by short-circuiting J1

All presentable characters of all character sets will be output nearly every second. As long as the jumper J1 is set to ON the test will be performed as closed loop. See also page 21.

Short-circuiting J2

The display is forced to start in upgrade mode, which otherwise is only possible by commands via USB interface or when the selftest program detects a faulty firmware. See also page 21.

Technical Data

The technical data of the BA63 customer display is detailed in the following table:

Display technology	Vacuum Fluorescence Display (VFD)
Character display	2 lines each with 20 alphanumeric characters Matrix: 5 x 7 pixel Height: 9.5 mm Width: 6.2 mm Color: green
Self-test function	possible via software control using ESC sequences and wire jumpers
Interface	USB 2.0 (Full Speed)
Transmission rate	12 Mbits/s gross data rate
Voltage supply	+5V (Vusb) typical 380 mA max. 500 mA
System connection	USB
Operating Systems	Windows 2000, Windows XP and Linux (MS-DOS is not supported)

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