

Nextbike GmbH

# Nextbike FVT4 Touchscreen

Instruction Manual

# Read me first

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- Before using the device, please read the entire manual and all safety instructions to ensure safe and proper use.
- The descriptions in this manual is based on the default settings of the device.
- The images and screenshots used in this manual may differ from the actual product.
- The contents of this manual may differ from the product, or from software provided, software versions are individually created based on the requirements of the particular bicycle rental system.
- Formatting and delivery of this manual is based on nextbike operating systems.
- Functions of this terminal may vary by region or hardware specifications.
- Please keep this manual for future reference.

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## **2. Summary**

The nextbike FVT4 Touchscreen is integrated into the nextbike terminal kiosk. This Touchscreen enables the customers to register, rent and return smart bikes directly through its interface via Smart Card and mobile number including PIN code, automating the release and lock process for all registered customers. Customers without Smart Cards or personal log in information also have the choice to activate the rental via App or phone call to the IVR-service hotline.

Furthermore, the system is connected to the nextbike Office Software via existing GSM/GPRS network in smartbox FVZ2, which permits locating and monitoring bicycle in real time on kiosk terminals, App or calling the IVR-service hotline.

## **3. Applications**

- Bicycle rental/return
- Registration
- Payment option

## **4. Hardware Description**

### **4.1 Nextbike's components:**

The terminal FVT4 consists of following main components:

- Plastic housing
- Main PCB
- Display
- Touch sensor
- 2 cables for connecting FVZ2 (smart box)

### **Components on main pcb**

Main pcb contains following components:

- Interface to smart box (FVZ2) – HDMI-interface and additional 8-pin-connector with:
  - Power supply (12V and Gnd)

- RS232-interface (RxD and TxD)
- 2 IRQ-lines (MCU IRQ and Touch IRQ)
- I<sup>2</sup>C-interface to touch sensor
- Power supply
  - 3.3V switching regulator for main logic
  - 3.3V switching regulator for HDMI converter and display
  - Current regulator for cathodes of display background illumination
  - 5V linear regulator for 125 kHz RFID
- RS232 converter
- HDMI converter for adapting HDMI signal to RGB signal
- 13.56 MHz RFID system
- 125 kHz RFID system
- Microcontroller with LEDs, buzzer, sensors for humidity and brightness, serial flash memory

## **Display**

Display has following features:

- Size: 7 inch
- Resolution: 800x480p
- Connector: Standard HDMI connector
- EEPROM for storing EDID data
- Type: Samsung LMS700KF21 or LMS700KF15

## **Touch sensor**

For user interaction a projected capacitive touch sensor of vendor Rocktouch is used.

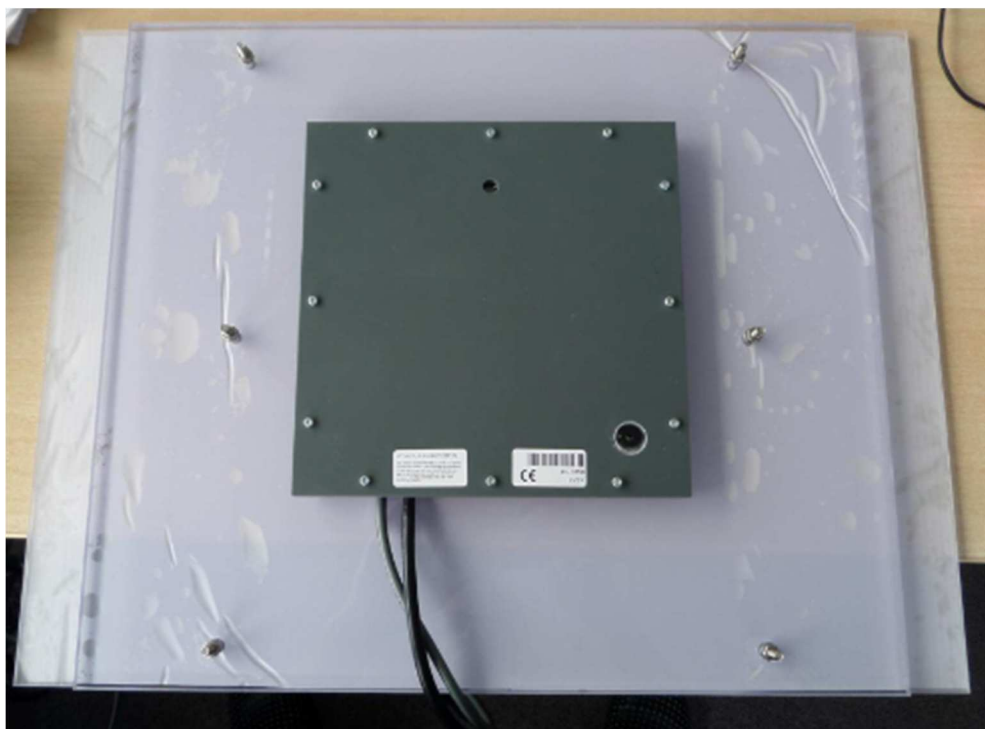
Cautions:

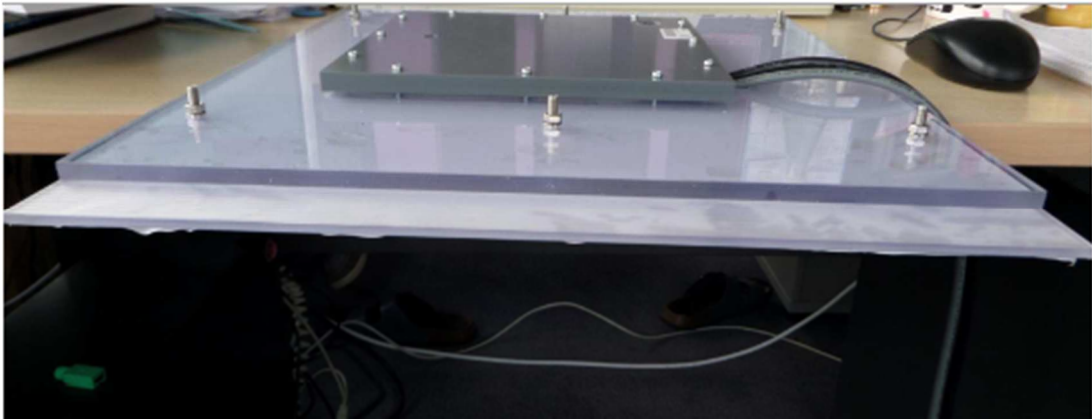
- A. Are developed with particular focus on vandalism and weather resistance (temperature range between 14 ℉ and 122 ℉).

- B. Is developed for energy efficiency. As a standard the terminal rests in sleep modus. With activating the unit via touch sensor or card reader the unit wakes up.
- C. The units are fixed in the terminal rack.
- D. The electric components are covered by a waterproof glued acrylic box.

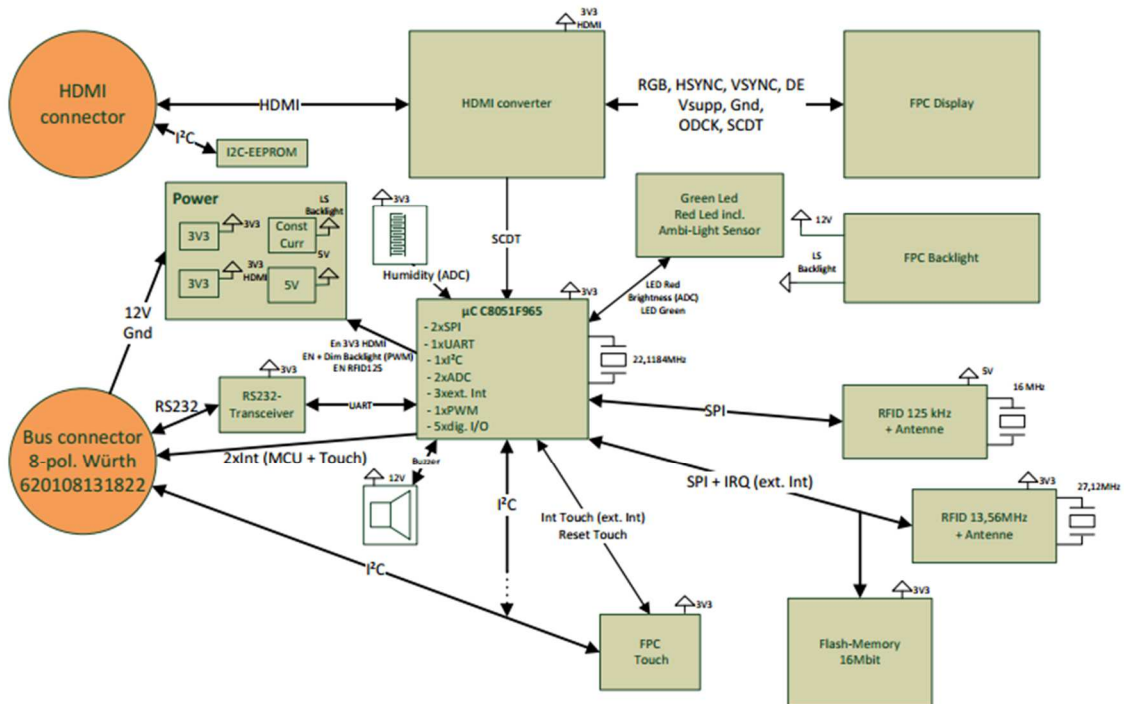
## 4.2 Design

### Extern





### 4.3 Block Diagramm



## 5. Functional Description

### Powermanagement

After powering FVT4 main 3.3V regulator is automatically running. It supplies main logic components including microcontroller. Clock source for controller is a 22.1184 MHz crystal.

All other regulators are switched on/off by microcontroller. This is done after appropriate command coming from smart box FVZ2 via RS232.

After receiving sleep-command FVT4 goes to sleep mode. In this state it is no longer accessible via RS232, but the only wake up sources are Touch sensor and RFID reader.

In sleep mode RFID reader cyclically provides an hf field, measures phase on antenna and wakes up system, if difference between measured phase and average value is greater than predefined threshold.

### **RFID 13.56 MHz**

Data from RFID reader are transparently transmitted to smart box FVZ2. So using different protocols and applications on the card is possible. RFID reader AS3911 (vendor Austria Microsystems) is clocked by a 27.12 MHz crystal.

### **RFID 125 kHz**

This reader is only used for getting the UID from the cards. Algorithm for running this reader is completely integrated in the microcontroller. So reading-process is just triggered by smart box FVZ2 and only result is sent back.

### **Further commands**

Via further commands from FVZ2 (smart box) following actions can be triggered:

- Switching on/off display backlight with different duty cycle
- Switching on/off red and green led
- Switching on/off buzzer
- Query values from humidity and brightness sensor
- Query version and status from system

## **6. Specification**

- Terminal FVT4 with 7" touchscreen
- Dimensions: 495 mm x 375 mm x 25 mm
- Weight: 3200 g
- RF Sensors: 13,56 MHz RFID and 125 kHz RFID
- Supply voltage: 12V
- Supply current: max. 1A



- Storage Temp.: -40 ƒ to 140 ƒ
- Operation Temp.: 1.4 ƒ to 131 ƒ
- Humidity: 5% - 95% non-condensing

## **7. Usage**

The FVT4 touch screen is not a stand-alone product. It requires a FVZ smart box or above to work. However, there are typical use-cases for the FVT4 in conjunction with a FVZ, that may vary based on the actual project implementation.

### **Information display**

- Customer touches on the screen to wake the display up
- The screen contains a menu for Registration, Rental/Return, a location Map and further information like prices and terms and conditions.

### **Rental via smart card**

- Customer holds card over the card reader below the touch screen
- Display wakes up and displays available bikes for rental or tickets for purchase
- Customer selects a bike and the screen shows information about the rental (e.g. lock code)
- After pressing „Cancel“ or after a certain time out, the display turns off

### **Rental via phone number and PIN**

- Customer touches on the screen to wake the display up
- Customer selects „Rental“ from the menu and enters phone number and PIN using the on-screen keyboard
- Customer selects a bike and the screen shows information about the rental (e.g. lock code)
- After pressing „Cancel“ or after a certain time out, the display turns off

### **Return**

- Customer wakes up the display via card or login

- Screen shows information about the current rentals
- Customers selects „Return”
- Screen shows information about how to secure the bike properly

The rental and return are also possible via App, boardcomputer or by calling the IVR-service hotline. In addition, the rental and return procedures are individually programmed per bike scheme and may differ from the described process.

## **8. Cautions**

- Please comply with the instruction to maximize the unit life.
- Keep the unit interior dry. Any liquid, i.e. rain, may destroy or damage the inside circuitry.
- Don't expose the unit to temperatures outside aforementioned temperature range.
- Please handle the unit with care. Excessive vibration or shaking might damage the unit.
- Clean the unit with a clean cloth, don't use any chemicals or detergent.
- Don't disassemble or refit unit.

## **9. FCC Statement**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.