

What is BEETLE moPOS?

BEETLE /moPOS

Traditional POS goes mobile



End Users Guide Software - What is BEETLE /moPOS

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2 General

2.1 Abbreviations

Aka	Also known as
BR	Business Requirement
FIFO	First-in, first-out
FW	Firmware
HW	Hardware
JavaPOS	Java for Retail POS
JDK	Java Development Kit
LAN	Local area network: wired network infrastructure
LSB	Linux Standard Base
OPOS	Ole for Retail POS
OS	Operating system
PDH	POS Device HUB
POS	Point of Service
SW	Software
UPOS	Unified POS Programming Interface for POS applications to access peripheral devices
WEP	Wired Equivalent Privacy a type of weak encryption used for WLAN communication
WLAN	Wireless local area network aka WiFi
WPA	Wi-Fi Protected Access

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2.3 Summary

This document gives a short overview of the BEETLE /moPOS concept and product.

3 Introduction and architecture: What is BEETLE /moPOS?

BEETLE /moPOS is an acronym for BEETLE **mobile POS**. The BEETLE mobile POS is a product that allows applications of traditional cash register systems to migrate to mobile applications.



The product concept contains the following modules:

1. One or more mobile devices (e.g. **tablets**) containing the POS application and presenting the graphical user interface and touch input for the end user.
2. One or more so called **POS Devices Hub**'s containing additional peripheral devices such as a POS printer, one or two scanners, a line display and a cash drawer.
3. For each POS device hub an additional **docking unit** allowing to plug in the tablet in case of using the peripherals with the tablet and its POS application. Battery charging, docking against theft and working with unique tablet IDs for hardware pairing of tablets with POS Device HUBs are additional features.
4. For each POS Device Hub an additional **EFT** device for electronic payment connected via LAN. (in the first step just LAN-based EFT devices are integrated)
5. An **Admin Server** software handling the connectivity and access control of tablets with POS devices and its peripherals with m:n relationship.

The POS Device Hub allows connecting already used POS peripheral devices as existing in USB or RS232 variants in their traditional way. The BEETLE /moPOS Device HUB with its intelligent firmware in conjunction with a market-usual WLAN router and the BEETLE /moPOS tablet allows Windows POS application using the standardized UPOS interface to migrate from traditional stationary POS system to mobile POS systems.

The intelligent BEETLE /moPOS Device HUB firmware handles the Unified POS (UPOS) interface between peripherals connected to the POS Device HUB and tablets. The UPOS interface follows the standard in version 1.13 and contains one additional class implementing interface **IPOSDeviceHub** which handles connecting, disconnecting, getting status of tablet docking states, undock tablets and others. In case only a 1:1 relationship is required, that is, you have only one tablet and one POS Device HUB; you may operate with the UPOS interface of the POS Device HUB; operating with the extension class IPOSDeviceHub interface is not needed necessarily.

Additionally, one big feature of the firmware is the so-called **Admin Server**. If activated, this software allows not only to handle 1:1 relationships but also to control relationships between "N" tablets and "M" POS Device HUBs. The admin server software is activated as a single instance on ONE POS Device HUB in a

network environment. This server has the overview about the current connected (claimed) states and docking states of all participating tablets and HUBs. It controls via internal access lists the permission and states of connection. The remote admin HTML WebGUI of the POS Device HUB allows administrators:

- lists for possible relationships between tablets and PDHs
- to get an overview about current states of tablets and PDHs
- to configure the Admin Server
- to define blacklists
- to clear possible remaining connections which may block a POS Device HUB from a central administration point

Summarized, the product contains

- hardware such as
 - o one or more tablets
 - o one or more POS Device HUB with its Docking Units and integrated existing peripheral devices (not part of the product)
 - o and a market-usual WLAN router (not part of the product)
- software such as
 - o the intelligent POS Device HUB Firmware
 - o the Admin Server Software
 - o the tablet Windows 8.1 operating system
 - o the BEETLE moPOS Unified POS interface middleware for Windows POS application providers

a whole concept for connectivity via wired and wireless communication lines.

3.1 Mobile device

Mobile devices may work with Windows operating systems such as Windows 8.1. In this case an (extended) Unified POS standardized interface is used. The extension is provided as an additional class **IPOSDeviceHUB** and handles mainly the administration of connection and disconnection of a mobile device to a POS Device HUB.

Mobile devices may also work under other operating systems which are not Windows based. Such operating systems are for example iOS or Android. In such a case a Websocket-based interface is defined to allow also usage under those operating systems. This interface is a type of "simplified UPOS" interface since it is oriented at the Unified POS standard but the number of properties, methods and events are highly reduced providing a higher abstraction for programming a POS application. Of course, this interface may also be used under Windows operating systems if the application does not want to use the Unified POS standard. Mainly this interface is intended to be used for HTML5 / javascript based applications. This interface is expected in a later step of BEETLE /moPOS and is not yet part of the product.

The claiming of peripherals at a particular POS device HUB by a tablet is done by a so-called Admin Server. Additionally the notification of tablets in case a tablet has been docked or undocked at a POS device HUB is done by the Admin Server. It's a piece of software which may run either on one designated POS Device HUB or on separate server hardware in the store. The Admin Server's job is to handle the claiming and docking states between several tablets and several POS Device HUB's to make sure that docking and claiming is only established if allowed.

3.2 POS device HUB, docking unit and its peripherals

The POS device hub is an intelligent device handling the peripheral access from the tablet. It has several USB and RS232 connectors as well as a cash drawer connector to allow connecting peripherals as typically used at a POS today. The device contains an embedded Linux-based operating system.

The main tasks of a POS device HUB are:

- Dealing the requests coming from tablets via TCP/IP and routing them to the connected peripherals.
- Handling the states of the system in case a tablet has been plugged into the docking unit.
- Optionally, reading the **ID of tablet** when plugged in and sending it to the Admin Server.
- Optionally, access control for individual peripheral categories depending on if tablet is docked or not.
- Dealing with the request from the tablet POS application for undocking the tablet in the docking unit.
- Handling the communication to the Admin Server when the tablet is docked or removed from the docking unit.
- Handling the feature of remote administration via a **browser-based Administration GUI**.
- Optionally, executing a single instance of Admin Server for controlling the arrangements of multiple mobile devices and multiple POS Device HUB's.
- Offering a **software plugin concept** to allow applications to add features in the POS Device HUB. Such features may be:
 - o Add peripheral devices to the POS device HUB which are not yet supported by the embedded Operating System
 - o Add additional features for graphical output on a possibly connected graphical screen – e.g. picture viewer, movie player
- Offering an easy way to update the Firmware of the POSDevice HUB itself and connected peripheral devices.

Handling the **charging of tablets** if plugged into the docking station.

3.3 Admin server

The administration server is a piece of software which does mainly the following tasks:

- Maintains a **list of all tablets, POS device HUBs and EFT** devices.
- Handling the **access control** of tablets to a POS Device HUB and their peripherals depending on defined rules (e.g. blacklist).
- Handling the **relationship of EFT device** access assigned to a POS device HUB.
- Handling events when plugging a tablet into the docking unit and dispatching the event to the appropriate tablet.
- Offering a method for tablets of **querying possible available POS device HUB's**.

3.4 EFT devices

EFT devices may be added to the set of peripherals of a POS device HUB. In a first step only EFT devices connected physically via LAN can be added. USB/RS232 EFT are not yet included.

3.5 WLAN router

A WLAN router is required in the network. The task of the router is mainly nothing else than allowing the routing of wireless connected tablets to a LAN segment. In the LAN segment the POS Device HUB and the Admin Server are connected.

3.6 Demo software for understanding the concept

There is also demonstration software in Java and .Net Technology as add-on (not part of the product) available.