MANUAL FOR MODULE: ABILIUM ROOM BOOKER

Extention to the existing ERP – System Odoo 18.0

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Guide Version: 1.0
Last Updated: May 26, 2025

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Introduction

Welcome to the user manual for the ‘Abilium Room Booker’ Module for Odoo.

This custom-developed module enables users to reserve meeting rooms directly through the Odoo calendar interface. Seamlessly integrated into the Odoo environment, it offers an intuitive solution for managing room availability and scheduling.

A unique feature of this module is its connection to a Raspberry Pi via MQTT protocol. This integration allows real-time updates of room reservations to be displayed on E-Ink screens, which can be installed outside meeting rooms. These displays provide a clear and low-power method to label rooms and show both current and upcoming reservations at a glance.

This project was developed as part of the “Software Engineering Internship” module at the University of Bern, in collaboration with Abilium Gmbh. It was designed and implemented by a team of students, combining principles of software engineering with practical IoT applications to deliver a complete, real-world solution.

This manual will guide you through the installation, configuration, and usage of the module to help you get the most out of your room reservation system.

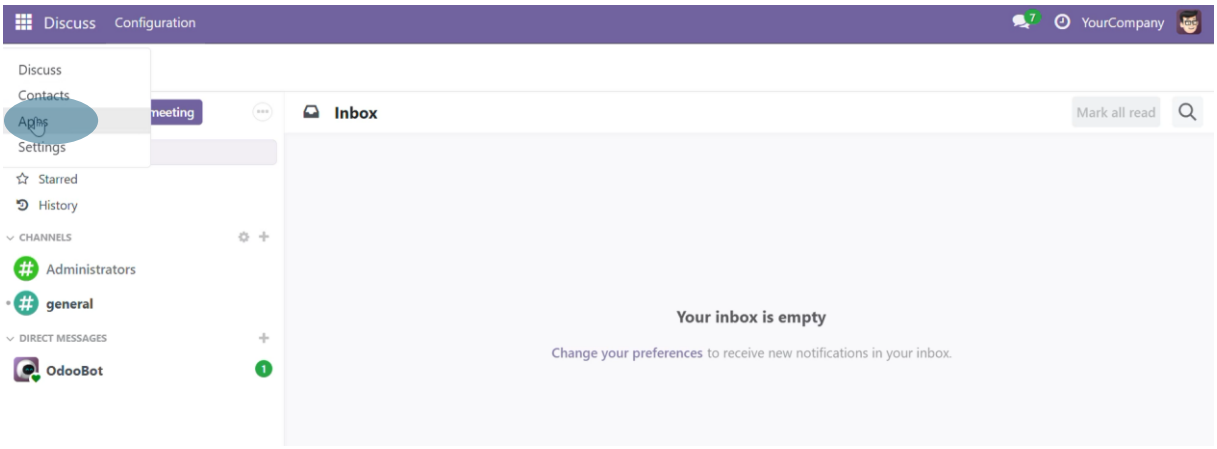
How to activate our module

To install the module, Odoo must already be installed. The installation instructions for the current version of Odoo can be found here: https://www.odoo.com/de_DE/page/download?msockid=39f4aad28e496d093fcab8658f426c19

Make sure that the folder from the "Abilium Room Booker" is copied into the “addons” folder of Odoo.

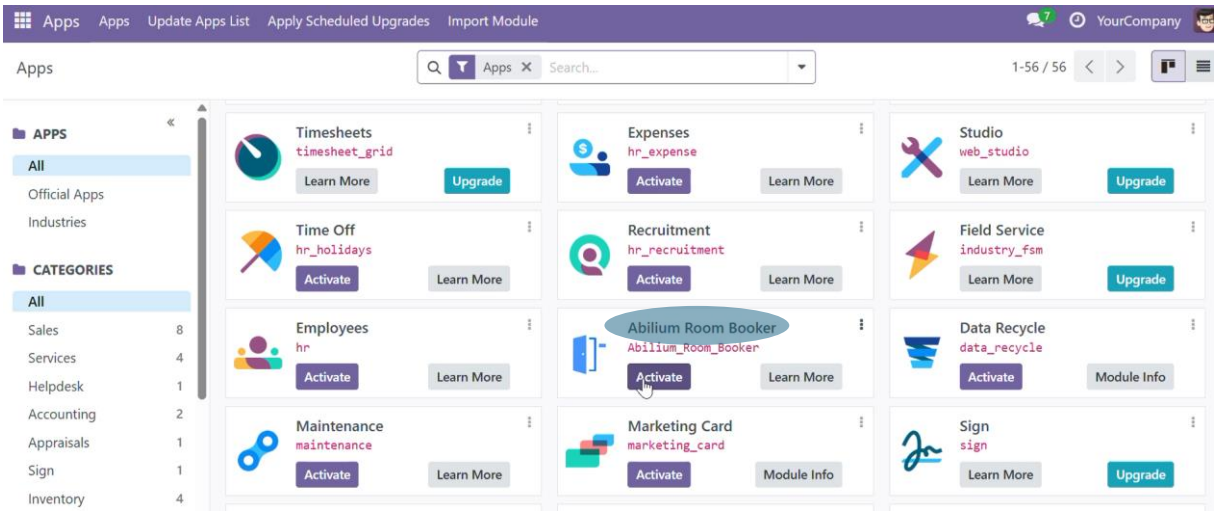
Step 1: Start your Odoo application

- Browse to the “Apps” Module.
- Click on “Apps” then “Update Apps List”. Click on “Update” in the window that opens.



Step 2: Install the “Abilium Room Booker” module

- Search for “Abilium Room Booker” and click on “Install”. “Make sure your module is activated after the installation.



Raspberry Pi Zero Setup Guide - Step by Step Installation

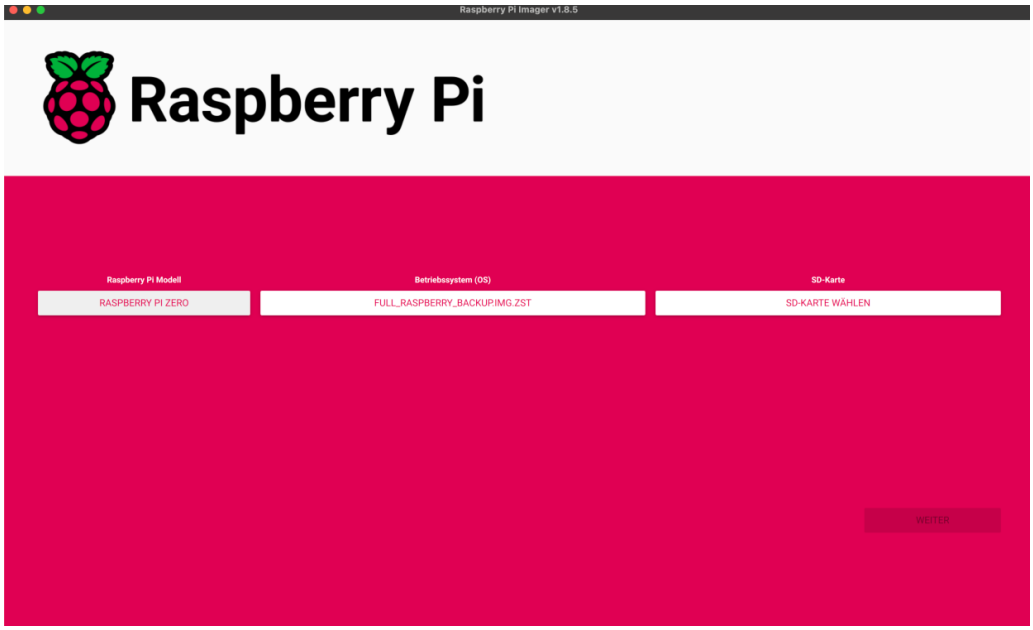
This guide will walk you through setting up your Raspberry Pi Zero with a Waveshare e-ink display. Don't worry if you're not technical - we'll explain everything clearly!

What You Need Before Starting
Make sure you have all these items ready:

- Raspberry Pi Imager (software you'll download)
- SD card (microSD card, 16GB or larger recommended)
- Raspberry Pi Zero (the small computer board)
- Waveshare e-ink display 2.13 inch (the screen)
- Our provided config file (you should have received this)
- Our provided Raspberry Pi image file (you should have received this)
- SD card reader (if your computer doesn't have a built-in SD card slot)
- Power adapter for the Raspberry Pi (micro USB)

Step 1: Install Raspberry Pi Imager
First, you need to download and install the Raspberry Pi Imager on your computer:

1. Go to the official Raspberry Pi website
2. Download the Raspberry Pi Imager for your operating system (Windows, Mac, or Linux)
3. Install the software by following the installation wizard
4. Once installed, open the Raspberry Pi Imager. It should look like this:

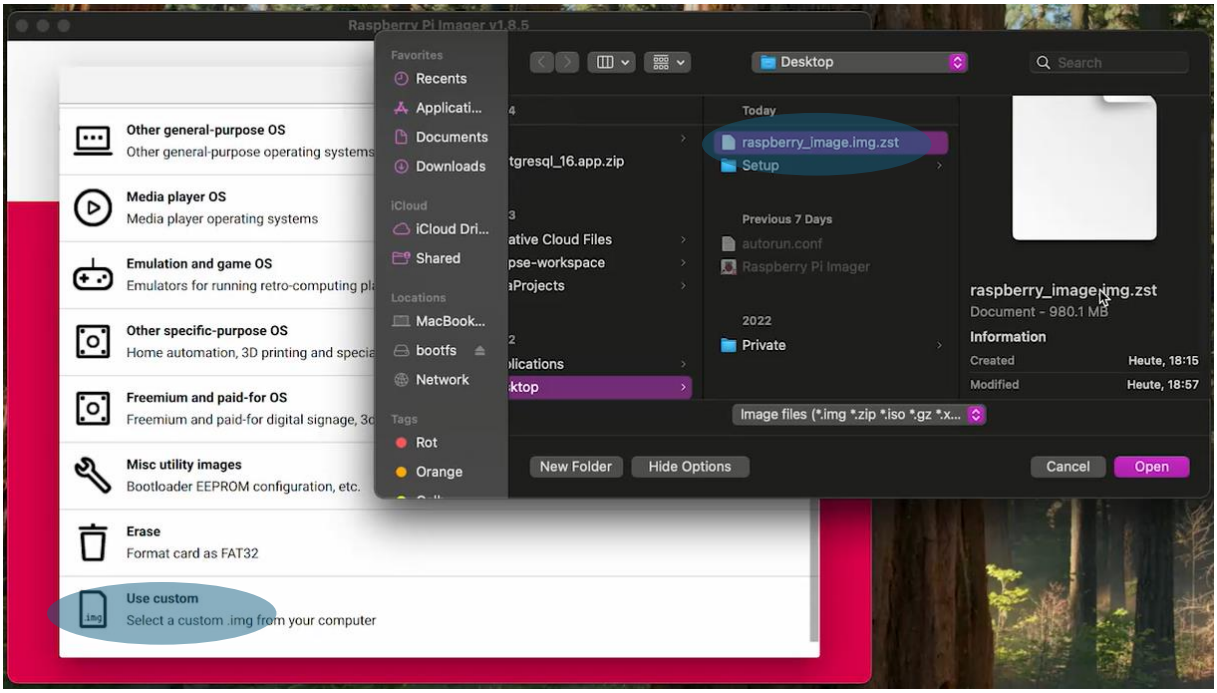


Step 2: Insert Your SD Card
Now you need to connect your SD card to your computer:

1. Take your microSD card
2. If your computer has a built-in SD card slot, insert the card directly
3. If your computer doesn't have an SD card slot, use an SD card reader:
    - Connect the SD card reader to a USB port on your computer
    - Insert the microSD card into the card reader
4. Your computer should recognize the SD card

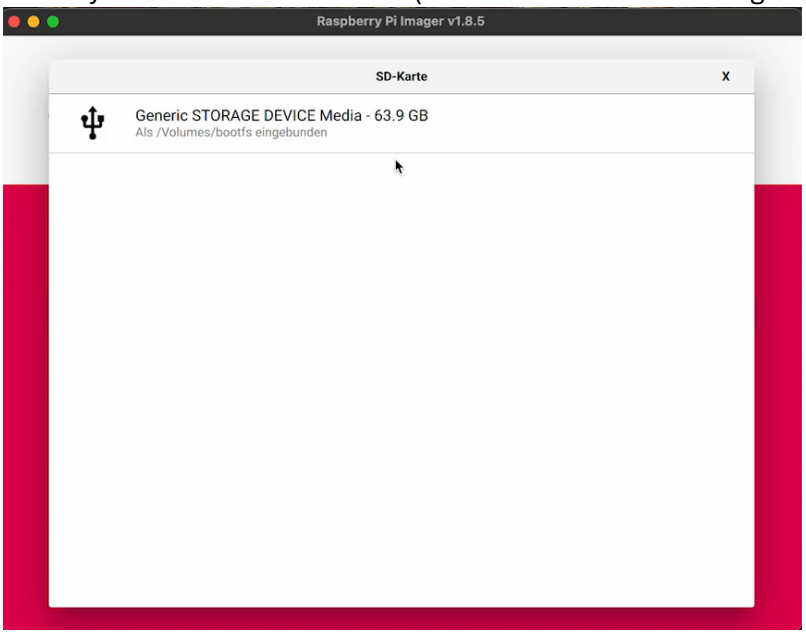
Step 3: Configure the Raspberry Pi Imager
Time to set up the imaging software:

- Open the Raspberry Pi Imager (if not already open)
- Click on "Choose Device" and select *Raspberry Pi Zero*
- Click on "Choose OS"
- Scroll down to the bottom of the list and select *"Use custom"*
- Browse to find and select the *Raspberry Pi image file* we provided to you
- The image will now be loaded into the imager



Step 4: Select Your SD Card

1. Click on "Choose Storage"
2. Select your SD card from the list (be careful to choose the right one!)



3. Click "Next" to continue
4. When prompted, click *"Edit Settings"* (this is important!)

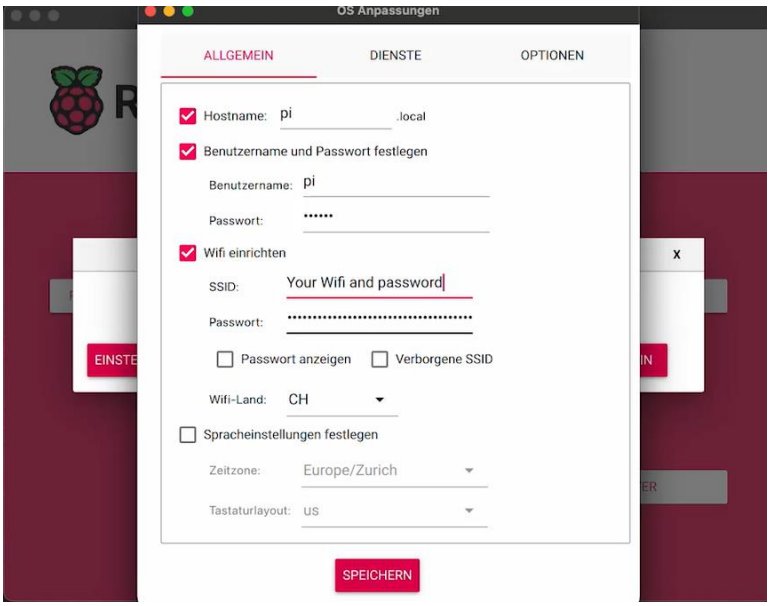
Step 5: Configure Important Settings
These settings are crucial for your Raspberry Pi to work properly:

Username Settings:

- Username: Make sure this is set to *"pi"* (this is very important!)
- Password: Choose a secure password you'll remember

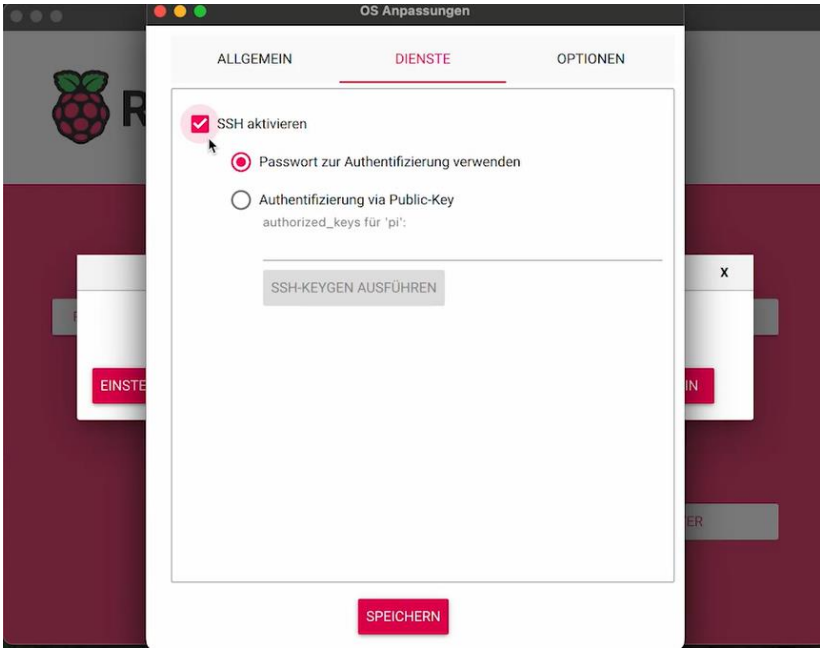
WiFi Settings:

- Enable WiFi: Check this box
- Network name (SSID): Enter your WiFi network name
- Password: Enter your WiFi password
- WiFi country: Select your country



SSH Settings:

- Enable SSH: Check this box (this allows remote access to your Raspberry Pi)



Save Your Settings:

- Click "Save" to save all your settings
- Click "Yes" to apply the settings
- Click "Yes" again to confirm you want to write the image to the SD card

Step 6: Write the Image to SD Card

This is where the magic happens:

- The writing process will begin automatically
- This can take up to 30 minutes (Hardware dependent) - be patient and don't disconnect anything
- You'll see a progress bar showing the writing and verification progress
- When complete, you'll see a "Write Successful" message

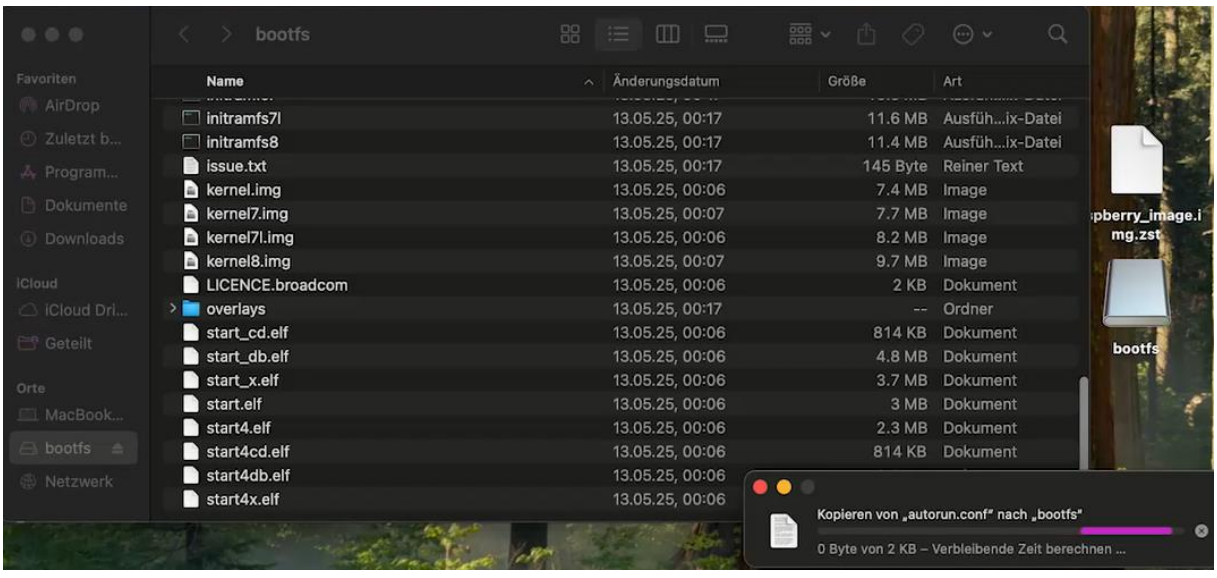
Step 7: Configure Your Config File
Important: Create a room in your Odoo module first. (See functionalities)

Before removing the SD card, you need to add your custom configuration:

- **Don't eject the SD card yet!**
- Open the autorun.conf file we provided to you
- Edit the following parameters in the config file (replace all "INPUT_YOUR_VALUES" with your actual information):
    1. rasp-name: Enter the rasp ID generated by the room
    2. broker: Enter your MQTT broker IP address or hostname
    3. port: Enter your MQTT broker port number (usually 1883 or 8883)
    4. Note: depending on your broker you have to enter the Username and Password

```
#!/bin/bash
# ================================================================
# Auto-run configuration file for Raspberry Pi e-Paper Display System
# ================================================================
# INSTRUCTIONS:
# 1. Place this file in the boot partition of your Raspberry Pi
#    (usually mounted at /boot/ or /boot/firmware/)
# 2. Replace all INPUT_YOUR_VALUES placeholders with actual values
# 3. Save the file
# 4. Reboot your Raspberry Pi to apply changes
# ================================================================

# ================================================================
# CORE CONFIGURATION
# ================================================================
# Path to your Python script - DO NOT CHANGE unless moving to a custom script
# This path points to the MQTT client for the e-Paper display

SCRIPT_PATH=/home/pi/e-Paper/RaspberryPi_JetsonNano/python/examples/mqtt_opt.py

# ================================================================
# DEVICE IDENTIFICATION
# ================================================================
# Device name - REQUIRED
# This value identifies your Raspberry Pi in the MQTT system
# Must be unique across all your devices
# Example: rasp-name=meeting-room-1

rasp-name=Your Raspberry ID

# ================================================================
# MQTT CONNECTION SETTINGS
# ================================================================
# MQTT Broker address - REQUIRED
# IP address or hostname of your MQTT broker server

broker=test.mosquitto.org

# MQTT Broker port - REQUIRED
# Standard ports: 1883 (unencrypted) or 8883 (TLS/SSL)

port=8883

# MQTT Authentication - OPTIONAL
# Username for MQTT broker authentication
# Leave empty or comment out if no authentication is required

# username=

# Password for MQTT broker authentication
# Leave empty or comment out if no authentication is required

# password=

# Topic prefix for MQTT messages
# All messages will use this prefix followed by the device name
# Default: test/room/ (results in topics like test/room/meeting-room-1/status)
topic-prefix=test/room/
```

- Save the edited config file
- Drag and drop the edited config file onto the SD card



- Important: A message will appear saying "A file named autorun.conf already exists" - click "Replace" to overwrite the existing file
- Make sure the file has been copied successfully

Step 8: Prepare Your Raspberry Pi

Now it's time to set up the hardware:

- Safely eject the SD card from your computer
- Insert the SD card into your Raspberry Pi Zero (the small slot on the board)
- Connect the Waveshare e-ink display to your Raspberry Pi (follow any connection instructions that came with your display)

Step 9: Power Up Your Raspberry Pi

Time for the moment of truth:

- Connect your Raspberry Pi to a power source using the micro USB power adapter
- The Raspberry Pi will start booting up
- Wait for the setup display to appear on the e-ink screen

Step 10: Troubleshooting

If the screen doesn't show the setup display:

- Disconnect the power from your Raspberry Pi
- Wait 10 seconds
- Reconnect the power to restart the Raspberry Pi
- The setup display should now appear
- If you see the following screens after the first successful setup there might be an issue with the internet, Mqtt-broker or Odoo
- Waiting for messages: you’re connected to the broker but don’t receive any messages

- Connecting to broker: Either the broker is down or the raspberry lost connection to the internet, plug out the cable and put it back in. To check if the broker is down, you can use the test connection button in the Odoo module.

You're Done!

Congratulations! Your Raspberry Pi Zero with e-ink display should now be running. The setup display indicates that everything is working correctly, and your device is ready to use.

Need Help?
If you encounter any problems:

- Double-check all connections
- Ensure your WiFi credentials are correct
- Make sure the config file was properly edited and copied
- Try the power cycle (disconnect and reconnect power) if the display isn't working

Remember, the most common issues are usually simple fixes like incorrect WiFi passwords or loose connections!

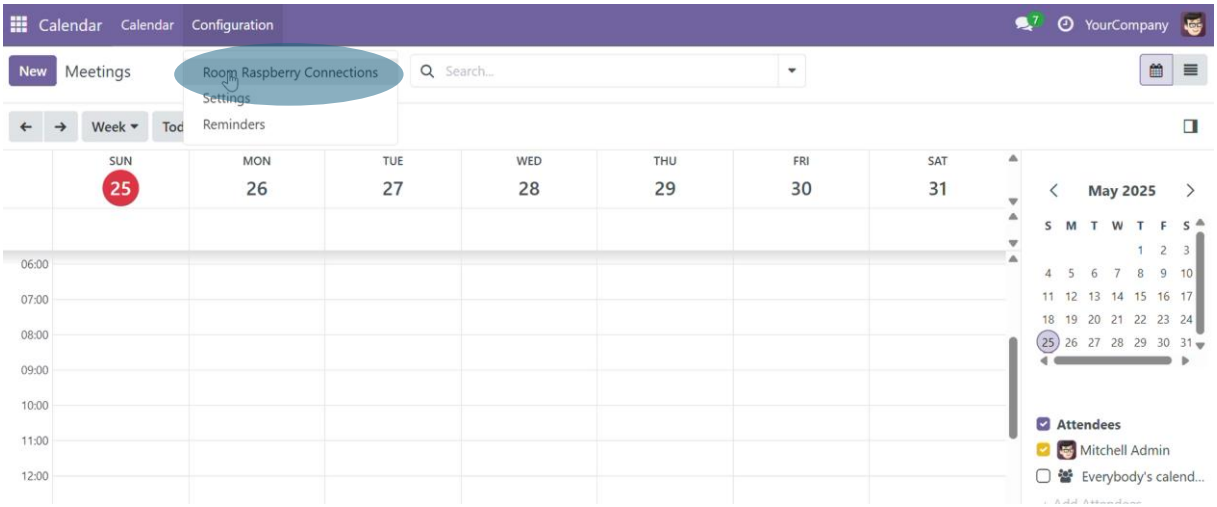
Installation Complete: Your Raspberry Pi Zero with e-ink display is now configured and ready for operation. The system will automatically connect to your MQTT broker and display relevant information on the e-Paper screen.

Functionalities

Creating a Room in the Odoo Room Booking Module

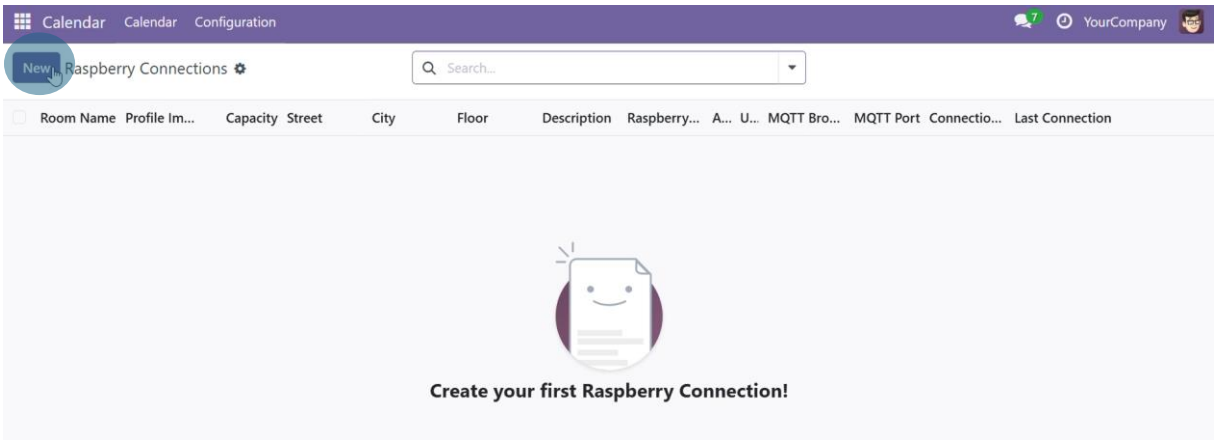
Step 1: Open the Abilium Room Booker Application

- Click on the Room Management or Administration section in the side menu.



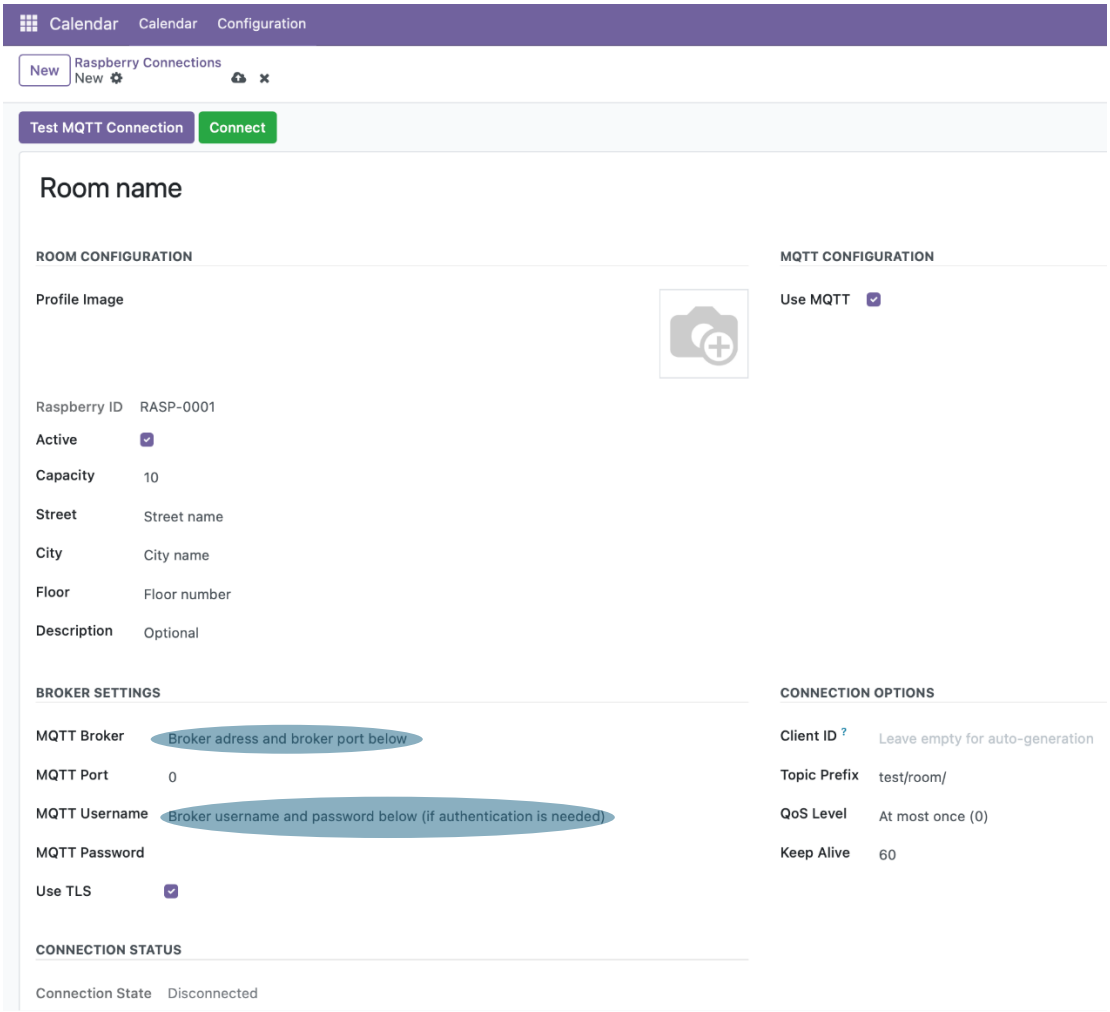
Step 2: Create a New Room

- Click the “New” button
- A room creation form will appear.



Step 3: Enter Room Details and Raspberry Information

- Fill in the required fields such as:
  – Room Name (e.g., "Meeting Room 1")
  – Location (e.g., "Building A, 2nd Floor")
  – Capacity (e.g., 10 people)
  – Equipment/Facilities if applicable (e.g., projector, whiteboard)
  –Broker settings
- Click “Connect” and then on the cloud to create the room.



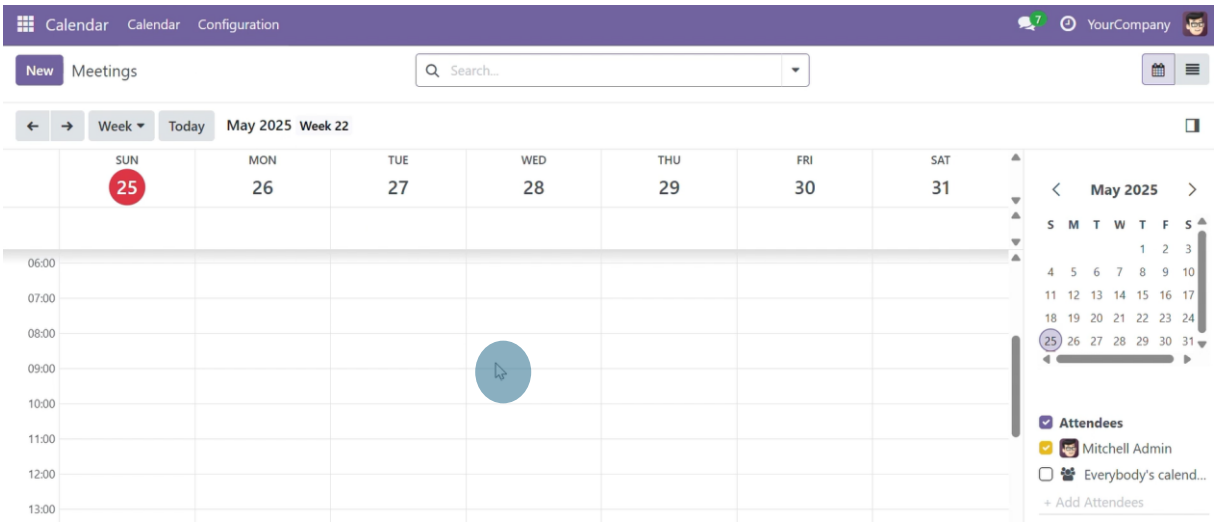
Reserving a Room in the Odoo Room Booking Module

Step 1: Open the Odoo Calendar

- Navigate to the Odoo dashboard.
- Click on the Calendar module to open the scheduling interface.

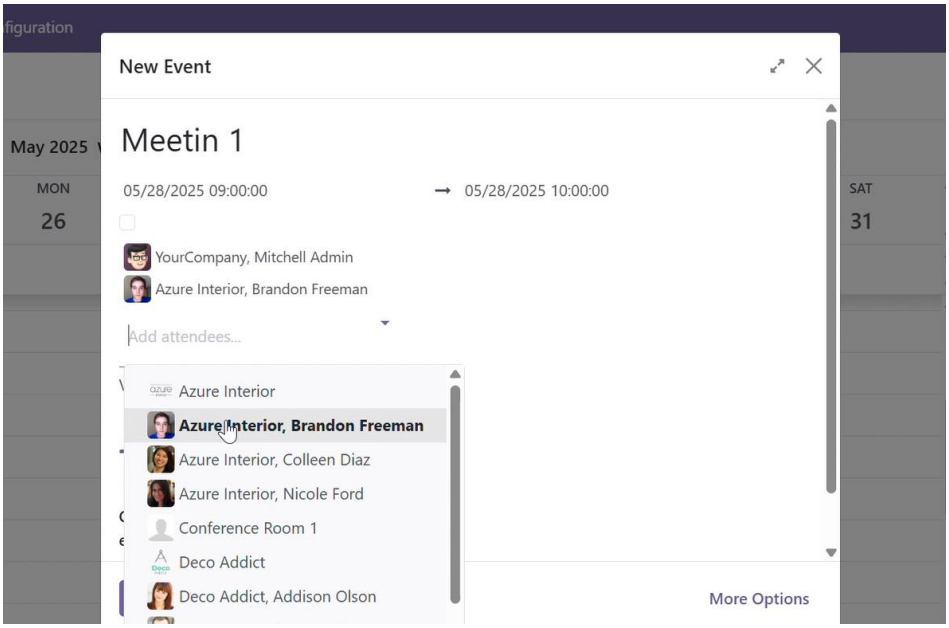
Step 2: Select a Date and Time Slot

- In the calendar view, click on the desired date and time where you'd like to book a room.
- A popup form appears to create a new meeting.



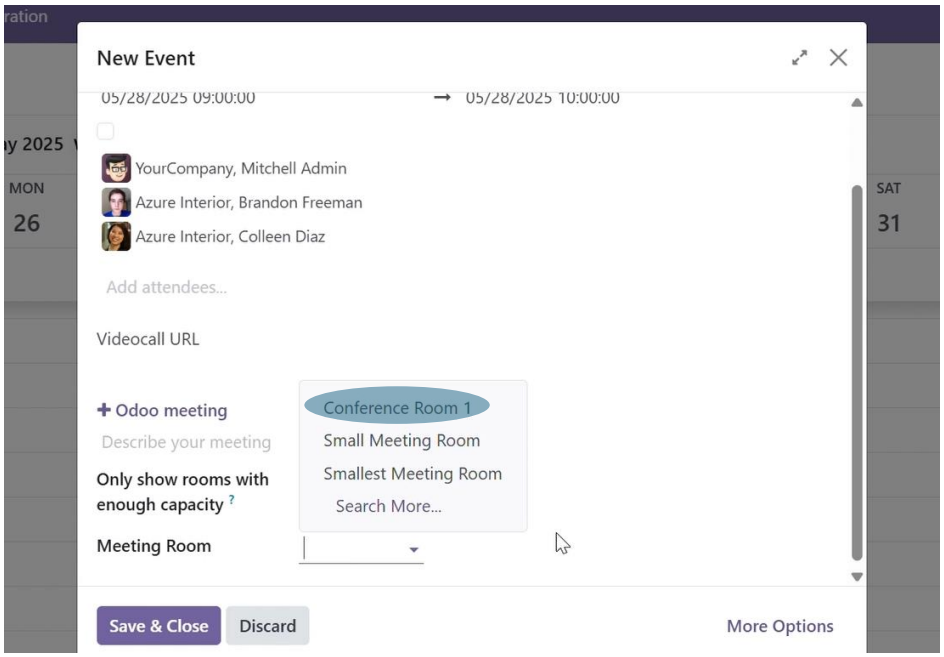
Step 3: Enter Meeting Details

- Fill in the Title of the meeting.
- Add additional details such as:
    - Start and end time
    - Participants (optional)



Step 4: Reserve a Room

- Choose a meeting room of your liking. You can activate the room filter, so you can only see Rooms that are big enough for all attendees. The system checks availability based on existing reservations.



Step 5: Save the Reservation

- Click the “Save” button to finalize the booking.
- The reservation now appears on the calendar and is synced via MQTT to the Raspberry Pi.