

## 🔴 Complete Procedure to Set Up the OPC UA Server on Raspberry Pi

This guide will **install, configure, and run the OPC UA server** on your **Raspberry Pi**, ensuring **automatic startup** and **daily reboot at 12:00 PM**.

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### ◆ Step 1: Place the Script in the Documents Folder

Run the following command to **move the script to the correct location**:

```
mv ~/Downloads/main.py ~/Documents/
```

Or, if the script is already in another location, adjust the command accordingly.

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### ◆ Step 2: Install Required Libraries (Without Virtual Environment)

Since we are not using a virtual environment, install the required libraries **globally**:

```
sudo pip install opcua psutil RPi.GPIO
```

If pip gives a **"externally managed environment"** error, run:

```
sudo pip install opcua psutil RPi.GPIO --break-system-packages
```

Verify that the libraries are installed correctly:

```
python3 -c "import opcua, psutil, RPi.GPIO; print('Libraries installed successfully!')"
```

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### ◆ Step 3: Create a Systemd Service to Auto-Start the Script

We need to **register the script as a systemd service** so that it runs **automatically on boot**.

❏ Create the service file:

```
sudo nano /etc/systemd/system/opcua_server.service
```

❏ Add the following content:

```
[Unit]
```

```
Description=OPC UA Server for Raspberry Pi
```

```
After=network.target
```

```
[Service]
```

```
ExecStart=/usr/bin/python3 /home/bicmes/Documents/main.py
```

```
WorkingDirectory=/home/bicmes/Documents
```

```
Restart=always
```

```
RestartSec=5s
```

User=pi

StandardOutput=append:/var/log/opcua\_server.log

StandardError=append:/var/log/opcua\_server.log

[Install]

WantedBy=multi-user.target

3 Save and exit:

- Press CTRL + X
- Press Y (Yes)
- Press Enter

4 Reload systemd to apply the changes:

sudo systemctl daemon-reload

5 Enable the service to start automatically on boot:

sudo systemctl enable opcua\_server.service

6 Start the service manually (for testing):

sudo systemctl start opcua\_server.service

7 Check if the service is running correctly:

sudo systemctl status opcua\_server.service

If you see "**Active (running)**", everything is working fine.

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#### ◆ Step 4: Implement Auto-Restart Every Day at 12:00 PM

To restart the Raspberry Pi daily at 12:00 PM, we will use a cron job.

1 Open the crontab editor:

sudo crontab -e

2 Go to the bottom and add the following line:

0 12 \* \* \* /sbin/shutdown -r now

Explanation:

- 0 12 \* \* \* → Runs at 12:00 PM every day.
- /sbin/shutdown -r now → Reboots the Raspberry Pi.

3 Save and exit:

- Press CTRL + X

- Press Y (Yes)
- Press Enter

4️⃣ Verify if the cron job was added:

```
sudo crontab -l
```

You should see:

```
0 12 * * * /sbin/shutdown -r now
```

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#### ◆ Step 5: Verify Everything is Working

Run these final checks:

##### ✅ Check if the service is running:

```
sudo systemctl status opcua_server.service
```

##### ✅ Check if the cron job is correctly scheduled:

```
sudo crontab -l
```

##### ✅ Test manual reboot:

```
sudo shutdown -r now
```

After the reboot, check if the **OPC UA server starts automatically**:

```
sudo systemctl status opcua_server.service
```

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##### ✅ Final Result

- ✓ OPC UA server script installed and running on boot
- ✓ Libraries installed globally
- ✓ Service registered in systemd for automatic execution
- ✓ Daily Raspberry Pi reboot scheduled at 12:00 PM
- ✓ Everything is now running smoothly! 🚀

If you need any adjustments, let me know! 😊