

WeldVision X5 Deployment - Visual Quick Reference

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The 3-Step Deployment Process

STEP 1: PREPARE

- Hardware
 - RDK X5 (powered **on**)
 - RDK Stereo Camera (connected **to** MIPI)
 - Ethernet cable (**or** WiFi)
- Network
 - Find RDK X5 IP address
 - SSH **access** verified

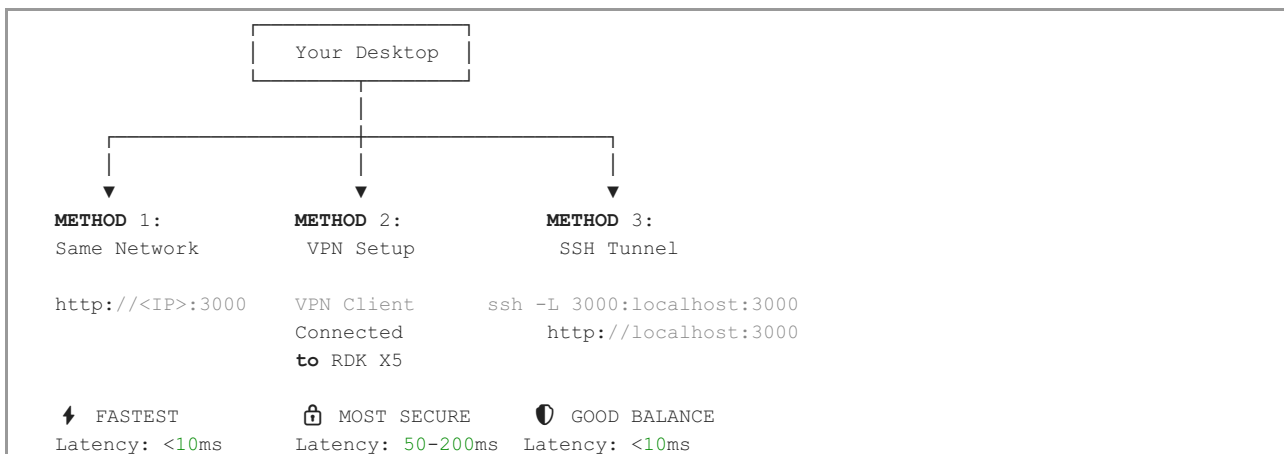
STEP 2: DEPLOY

- SSH **to** RDK X5
- Copy** code
- Install dependencies
 - Python (backend)
 - Node.js (frontend)
- Build frontend
- Start** services

STEP 3: ACCESS

- Open** browser
- Navigate **to** `http://<RDK_X5_IP>:3000`
- Add** student
- Test Live Scanner
- Done! ☒

Network Access Methods



Deployment Methods Comparison

QUICK START			
Setup: 5-10 min	Production: Not yet	Multiple: ✗	
Complexity: __	Learning: _■■	Docker: ✗	

COMPLETE SYSTEMD GUIDE			
Setup: 30-45min	Production: ☑ YES	Multiple: ✗	
Complexity: _■■	Learning: _■■■	Docker: ✗	

DOCKER DEPLOYMENT			
Setup: 15-20min	Production: ☑ YES	Multiple: ☑	
Complexity: _■■	Learning: _■■■	Docker: ☑	

💡 Key Ports Reference

FRONTEND

```
Port 3000
React/Vite App
http://<IP>:3000
```

BACKEND API

```
Port 5000
Flask Server
http://<IP>:5000
```

SSH ACCESS

```
Port 22
SSH Terminal
ssh root@<IP>
```

📋 Quick Checklist

Pre-Deployment

- ☐ RDK X5 powered **on**
- ☐ Camera connected **to** MIPI
- ☐ Ethernet cable connected
- ☐ Router/**switch** accessible
- ☐ Desktop **on same network**
- ☐ SSH client installed (Windows/Mac/Linux)
- ☐ Code repository cloned locally

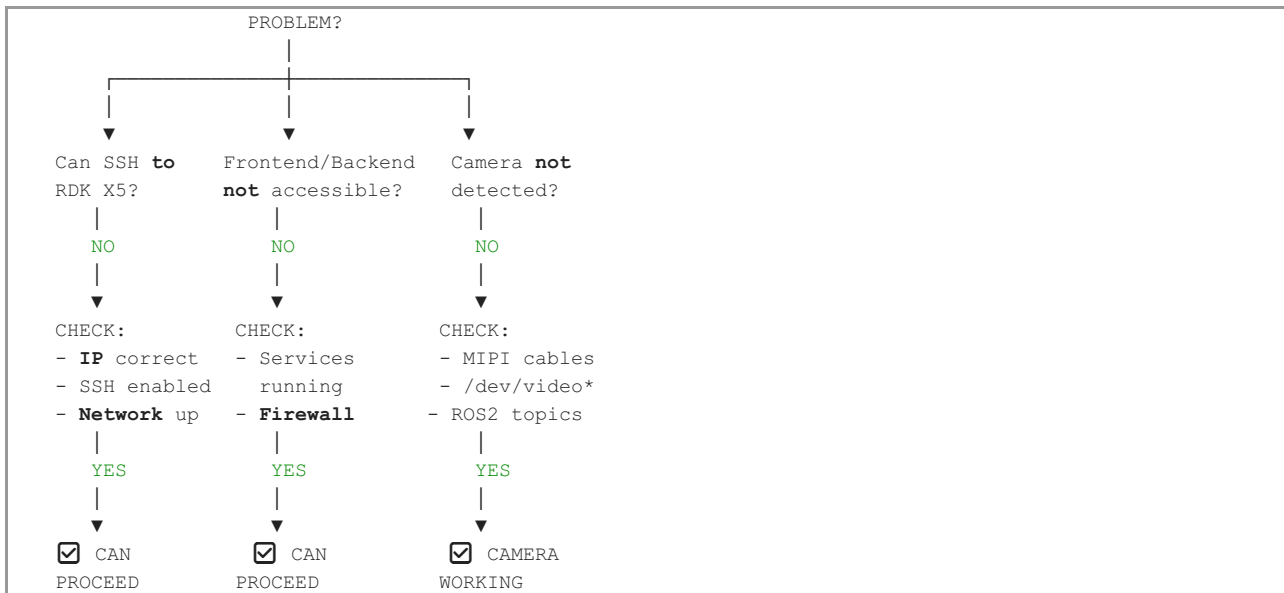
Deployment

- ☐ Found RDK X5 IP address
- ☐ SSH access verified
- ☐ Code copied to RDK X5
- ☐ Dependencies installed (Python + **Node**)
- ☐ **Frontend** built
- ☐ Services **started**
- ☐ Services running **in** background

Post-Deployment

- ☐ Frontend loads (<http://<IP>:3000>)
- ☐ Backend responds (<http://<IP>:5000/api/health>)
- ☐ Can add students
- ☐ Live Scanner works
- ☐ Results displayed
- ☐ Data persists **in** history
- ☐ Remote access configured
- ☐ Security hardened
- ☐ Backups scheduled

Troubleshooting Flow Chart



5-Minute Deployment Commands

```

# 1. Find IP
ssh root@192.168.1.100 # or check router

# 2. Deploy
ssh root@<IP> "mkdir -p /opt/weldvision"
scp -r ./code root@<IP>:/opt/weldvision/

# 3. Setup (inside RDK X5)
cd /opt/weldvision/backend
python3 -m venv venv && source venv/bin/activate
pip install -r requirements.txt

cd ..
apt-get install -y nodejs npm
npm install && npm run build

# 4. Start
cd backend && source venv/bin/activate && python3 app.py &
cd .. && npm run preview -- --host 0.0.0.0 &

# 5. Access
# Open: http://<RDK_X5_IP>:3000
  
```

Security Quick Setup

```
1. Change Password
   passwd root

2. Enable Firewall
   ufw enable
   ufw allow 22/tcp
   ufw allow 3000/tcp
   ufw allow 5000/tcp

3. SSH Keys (Optional)
   ssh-keygen -t ed25519
   ssh-copy-id -i ~/.ssh/id_ed25519.pub root@<IP>

4. Update System
   apt-get update && apt-get upgrade -y
```

Performance Expectations

```
FRONTEND LOAD TIME
Local   (SSH):    <200ms  ██████████
LAN     (WiFi):   <500ms  ██████████
LAN     (Ethernet): <100ms ██████████
VPN     (Remote): <1s    ██████████

BACKEND RESPONSE
Scan Request: <500ms
API Health:   <100ms
Database:     <50ms

NETWORK BANDWIDTH
Live Feed:    ~3-5 Mbps
API Traffic:  <1 Mbps
Total Req'd:  10 Mbps (good margin)
```

Directory Structure After Deploy

```
/opt/weldvision/
├── backend/
│   ├── venv/           # Python environment
│   ├── app.py          # Flask server
│   ├── weld_data.db    # Database
│   └── requirements.txt
├── frontend/
│   ├── src/            # React source
│   ├── dist/           # Built app
│   ├── node_modules/
│   └── package.json
├── docker-compose.yml  # Docker config
└── nginx.conf          # Reverse proxy
```

Access After Deploy

WELDVISION X5 DEPLOYED

- 🌐 Frontend
`http://192.168.1.100:3000`
`http://weldvision-x5.local:3000`
- ⚙️ Backend API
`http://192.168.1.100:5000`
`http://weldvision-x5.local:5000`
- 🖥️ SSH Access
`ssh root@192.168.1.100`
`ssh root@weldvision-x5.local`
- 📊 Status
Services: Running ☒
Camera: Detected ☒
Database: Ready ☒

🚀 Next Steps After Deployment

IMMEDIATE (< 5 min)

- Open frontend in browser
- Add a test student
- Run Live Scanner capture

SHORT TERM (< 1 hour)

- Configure remote access (VPN/SSH)
- **Set** up firewall rules
- Enable auto-backup
- Test from another computer

MEDIUM TERM (< 1 day)

- Security hardening
- System updates
- Performance optimization
- Documentation review
- Team training

LONG TERM (ongoing)

- Regular backups
- Security updates
- Performance monitoring
- Maintenance tasks
- Issue resolution

🎓 Which Guide to Read?

START HERE

- |
 - └─ Do you want...?
 - └─ Fast deployment?
 - └─ [QUICK_START_DEPLOYMENT.md](#) (5 min read)
 - └─ Complete details?
 - └─ [COMPLETE_DEPLOYMENT_AND_REMOTE_ACCESS_GUIDE.md](#) (30 min read)
 - └─ Containerized setup?
 - └─ [DOCKER_DEPLOYMENT_GUIDE.md](#) (20 min read)
 - └─ Navigation help?
 - └─ [DEPLOYMENT_DOCUMENTATION_INDEX.md](#) (5 min read)

Quick Help

Problem? Search for it in **Troubleshooting** section of chosen guide

Stuck? Run `sudo journalctl -u weldvision-backend -f` to see what's happening

Network issue? Run `ping <RDK_X5_IP>` to test connectivity


Camera issue? Run `ls /dev/video*` to check detection

Service issue? Run `sudo systemctl status weldvision-*.service`

Success Indicator

You'll know it's working when you see:

- ☒ Browser shows WeldVision X5 dashboard
- ☒ Can navigate **to** "Live Scanner"
- ☒ Can **select** a student
- ☒ Can click "Capture"
- ☒ **Get** analysis results back
- ☒ Results appear **in** history
- ☒ Can **access from** another computer **on** network

READY TO DEPLOY? → Pick a guide above and get started! 

All guides are tested, production-ready, and include troubleshooting.