Serial Splitter User Guide

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1. INTRODUCTION

Serial Router is a production-hardened serial port routing application for offshore environments. It routes data between one incoming port and two fixed outgoing ports (COM131, COM141) with automatic recovery.

2. SYSTEM OVERVIEW

Architecture:

- 1 x Configurable incoming port → 2 x Fixed outgoing ports (COM131, COM141)
- Bidirectional communication with automatic reconnection
- Thread-safe operation with health monitoring
- Real-time GUI monitoring interface

Requirements:

- Windows 10/11
- Python 3.8+ with PyQt6 and pyserial
- com0com virtual serial port driver
- Available COM ports: incoming (configurable), COM131, COM141

3. COM0COM VIRTUAL PORT SETUP

Serial Router requires virtual port pairs created by com0com for proper operation.

Required Port Pairs

- **Pair 1:** COM131 ↔ COM132
- **Pair 2:** COM141 ↔ COM142

Configuration Parameters

Parameter	Value	Purpose
EmuBR	yes	Enables baud rate emulation for realistic speed simulation
EmuOverrun	yes	Prevents buffer hangs by simulating physical port overflow behavior
ExclusiveMode	no	Keeps ports visible to all applications
AllDataBits	yes	Supports all data bit configurations (5,6,7,8 bits)
cts	rrts	Maps CTS (Clear To Send) to remote RTS signal
dsr	rdtr	Maps DSR (Data Set Ready) to remote DTR signal
dcd	rdtr	Maps DCD (Data Carrier Detect) to remote DTR signal

Manual Setup Commands

Open com0com Setup Command Prompt and execute:

```
 # Create Port Pair 1 (COM131/COM132)
command> install PortName=COM131,EmuBR=yes,EmuOverrun=yes,ExclusiveMode=no,AllDataBits=yes,cts=rrts,dsr=rdtr,dcd=rdtr PortName=COM13

# Create Port Pair 2 (COM141/COM142)
command> install PortName=COM141,EmuBR=yes,EmuOverrun=yes,ExclusiveMode=no,AllDataBits=yes,cts=rrts,dsr=rdtr,dcd=rdtr PortName=COM14
```

4. INSTALLATION

1. Install com0com virtual serial port driver
2. Configure virtual port pairs (see Section 3)
3. Extract Serial Router files to installation directory
4. Install dependencies: `pip install PyQt6 pyserial`
5. Verify installation: `python main.py`

5. OPERATION

Starting the System

```
# GUI Mode (Recommended)
python main.py

# Headless Mode
python src/core/router_engine.py
```

Configuration

Edit `config/serial_router_config.json`:

```
{
  "incoming_port": "COM54",
  "incoming_baud": 115200,
  "outgoing_baud": 115200,
  "timeout": 0.1,
  "retry_delay_max": 30,
  "log_level": "INFO"
}
```

Normal Operation

1. Launch application: `python main.py`
2. Select incoming port from dropdown
3. Click "Start" to begin routing
4. Monitor status indicators:
    - **Green:** Connected and active
    - **Yellow:** Connecting/reconnecting
    - **Red:** Disconnected/error

6. MONITORING

Real-time Status:

- Connection indicators for all ports
- Data transfer counters
- Connection uptime
- Error statistics

Logging:

- File: `serial_router.log` (10MB rotation)
- Levels: INFO, WARNING, ERROR, DEBUG

7. TROUBLESHOOTING

Common Issues

Application Won't Start:

- Install dependencies: `pip install PyQt6 pyserial`
- Run as administrator
- Check Python version (3.8+)

COM Port Access Denied:

- Close other applications using ports
- Check Device Manager for conflicts
- Restart system to clear port locks

Virtual Ports Missing:

- Verify com0com installation

- Check port pair configuration
- Reinstall virtual port pairs if needed

No Data Transfer:

- Verify baud rate settings match devices
- Check cable connections
- Confirm COM131/COM141 availability

Frequent Disconnections:

- Check cable connections
- Verify power supply stability
- Adjust timeout in configuration

Restart Procedures

Software Restart:

1. Close and relaunch application
2. Restart Windows (if unresponsive)
3. Hard reset (last resort)

After Power Loss:

- System auto-starts if configured
- Manual start: Double-click desktop icon or run `python main.py`

8. CONTACT INFORMATION

Role	Contact
Technical Support	[TO BE COMPLETED]
System Administrator	[TO BE COMPLETED]

For technical support, contact designated personnel listed above.