



LM048-058 Printer Application Note

Document Version 1.0

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Version History

Date	Version	Comments
09/08/2012	V1.0	First Version

1 Introduction

Document Conventions

Wherever the term adapter is used, the statement holds true for all these adapters - LM048, LM058.

Intended Audience

This document is intended for users who would like to use a pair of the adapters with POS printers as serial cable replacement solution. The document also covers information about transmission of RS232 Control Signals over Bluetooth.

Brief Overview

A pair of LM048 and LM058 Adapters can be configured to automatically connect to each other and reject connections from any other devices. This process is called pairing the adapters. Pairing procedure is not covered in the scope of this document. Once the adapters are paired together, one becomes a **master** which initiates the connection and other becomes the **slave** which accepts the connection. The settings of master and slave are shown in the following sections.

One of the paired adapters can be connected to the serial port of Printer and other to the serial port of POS terminal or PC. Once configured properly, the adapters will transmit data bi-directionally.

2 Setup

2.1 Requirements

The list of requirements is shown below

1. Pair of LM048 or LM058 Adapters
2. PC with serial port or USB to RS232 cable, running Windows XP, VISTA or 7 OS, for configuring adapters using LM149 Software
3. LM149 Software v 1.5 or above. It can be downloaded from this [link](#)
4. Serial Cable (Straight or Twisted/Null Modem)
5. Serial Printer to be tested
6. POS terminal or Printer Software

2.2 Setup Procedure

1. Download and install the LM149 Software. Check the version is v1.5 or above by going to Help->About menu option
2. Configure the adapter by connecting the adapter to the serial port of the PC. The configuration screenshots of adapters are given in the below sections
3. Make sure the serial settings of the printer match the serial settings of the serial printer. Most of the serial printers have default serial settings 9600 8 N 1. Please do a self-test on the printer for checking the serial settings.
4. Connect one adapter to POS terminal or PC and the other adapter to the serial printer. Power on the adapters. They should automatically connect to each other if configured properly.

- Send a print from the POS terminal to the printer and see if the print is successful. If not, then refer the Troubleshooting section of this document for possible issues.

3 Adapter Configuration

The master and slave configuration along with comments is shown in the figure below.

Serial Settings of Adapter should match with printer. Flow control here is RTS/CTS flow control. If printer uses DTR/DSR flow control then leave flow control disabled

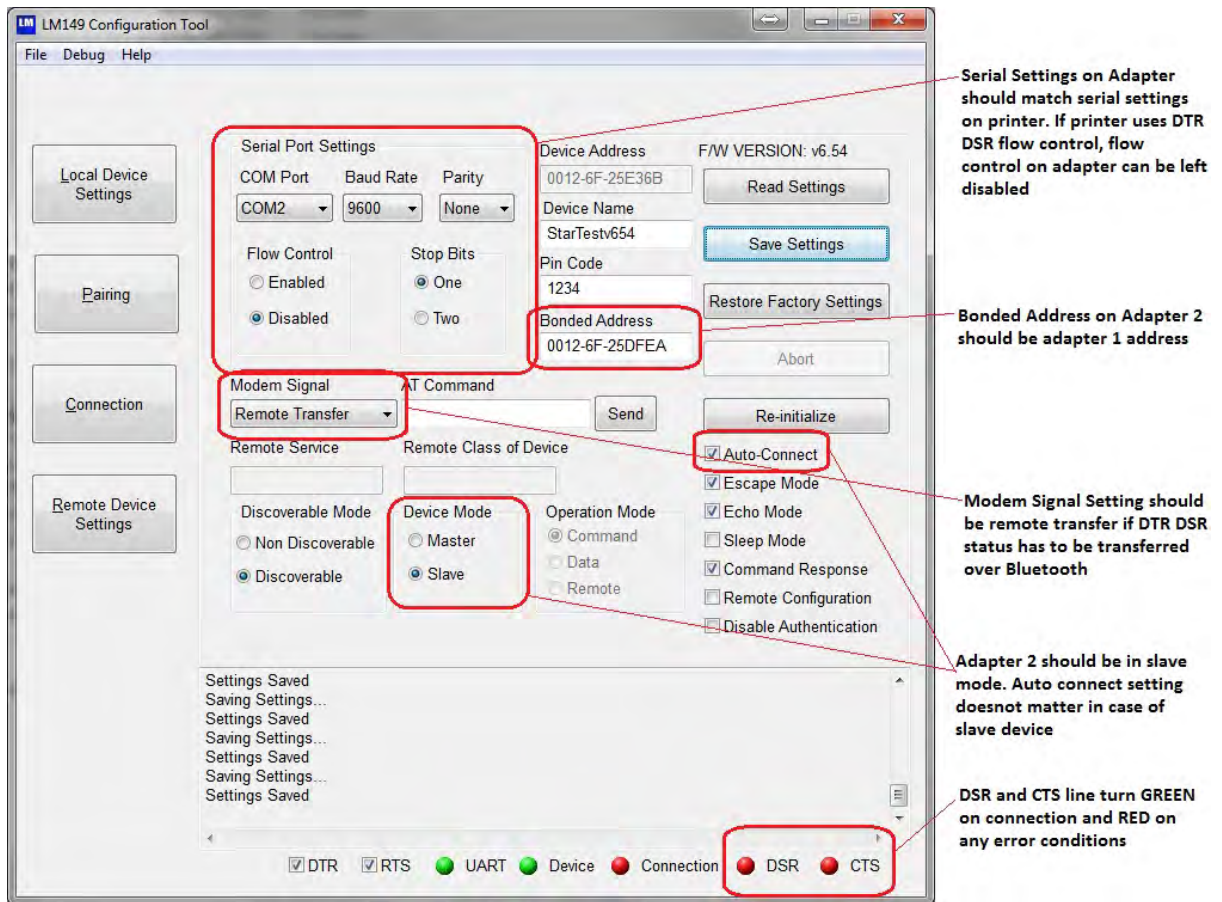
Modem Signal Setting should be remote transfer if you want DTR/DSR status to be transferred over Bluetooth

Banded address on Adapter 1 should be adapter 2 address

Make sure Adapter 1 is master and auto connect is enabled

DSR/CTS lines will turn GREEN on connection and RED on error conditions

Master Adapter Settings



Slave Adapter Settings

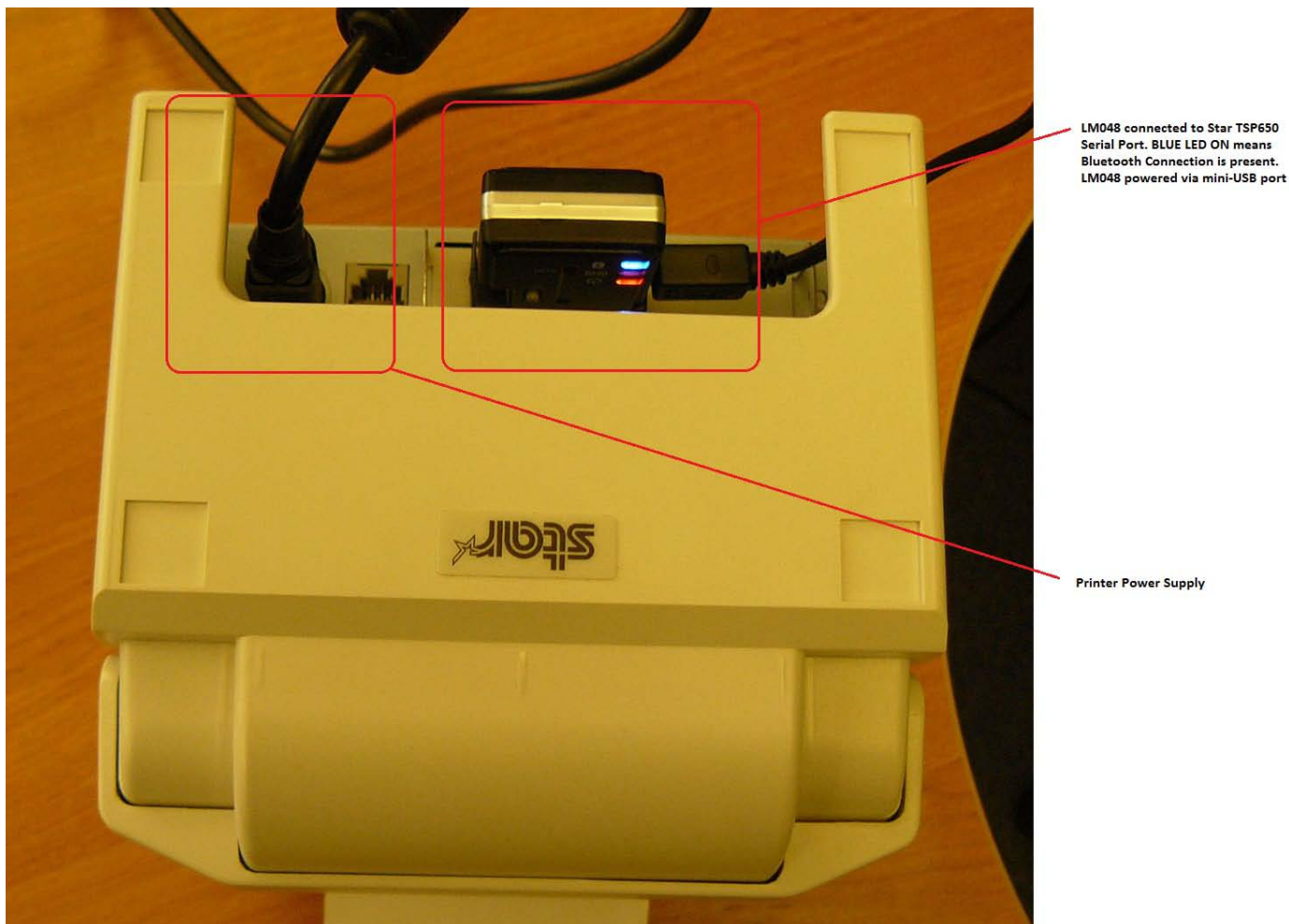
- The important configuration points are also summarized below
- Serial Settings:** The serial settings on both master and slave adapters should match the serial settings on the printer. If the printer uses DTR DSR flow control, then flow control settings can be left disabled.
 - Modem Signal:** Modem signal setting on both adapters should be Remote Transfer. This means the RS232 control signals' (CTS, DSR) status will be transmitted over Bluetooth to the remote adapter.
 - Device Mode:** One adapter is Master and other adapter is slave
 - Banded Address:** The master adapter has slave's Bluetooth Address as banded address. The slave adapter has master's Bluetooth Address as banded address.
 - Auto Connect:** Auto-connect setting should be enabled on the master since the master initiates the connection. Auto connect setting on the slave is not relevant. It can be enabled or disabled.
 - Command Response:** On connection and disconnection, the master and slave sends an ASCII string "CONNECT XXXX-XX-XXXXXX" and "DISCONNECT XXXX-XX-XXXXXX" where XXXX-XX-XXXXXX is the Bluetooth address of the remote device. To disable these messages, the Command response should be disabled.
 - DSR/CTS LED Indications:** If flow control is enabled, the CTS line is controlled by serial port driver. Otherwise CTS and DSR lines turn GREEN on connection when modem signal setting is remote transfer. CTS and DSR lines turn RED on disconnection or printer error conditions.

4 Printer Setup

The printer should have a 9 pin or a 25 pin port to connect the serial adapter. If the printer has 25-pin port, then 25 pin to 9 pin connector (LM Product Name: LM025) can be used to connect the adapter to the printer.

A pre-requisite for modem control status over Bluetooth to work is that the printer should de-assert its DTR line in case of error condition like cover open, out of paper, power failure etc. If the printer does not de-assert the DTR line on error conditions, the DSR line on the POS terminal or PC side will not be de-asserted. Please check the printer manual for the same.

The below picture shows the adapter connection with Star Micronics TSP650 printer. Some printers provide power on Pin 9 in which case the adapter need not be powered by mini-USB port. In case of Star TSP650, the adapter is powered via mini-USB cable.



Adapter Connection to Printer Back Panel (Top View)

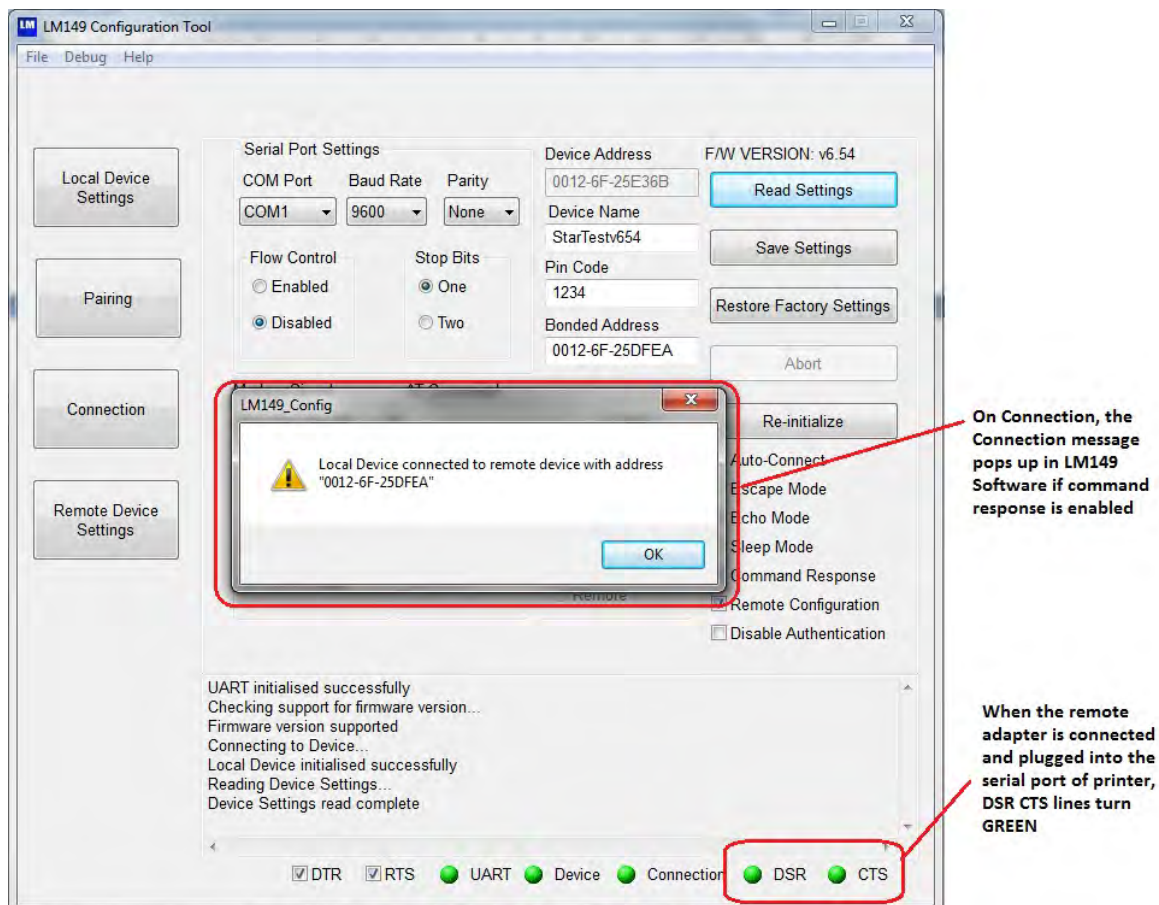
Adapter Slide Switch Setting

LM048: If the printer works with a null modem or cross serial cable, then slide switch setting should be towards the 9 pin port i.e. DCE, otherwise if the printer works with a straight serial cable, the slide switch position should be away from 9 pin port i.e. DTE. If unsure, try both slide switch settings.

LM058: If the printer works with a null modem or cross serial cable, then slide switch setting should be away from the 9 pin port i.e. DTE, otherwise if the printer works with a straight serial cable, the slide switch position should be towards 9 pin port i.e. DCE. If unsure, try both slide switch settings.

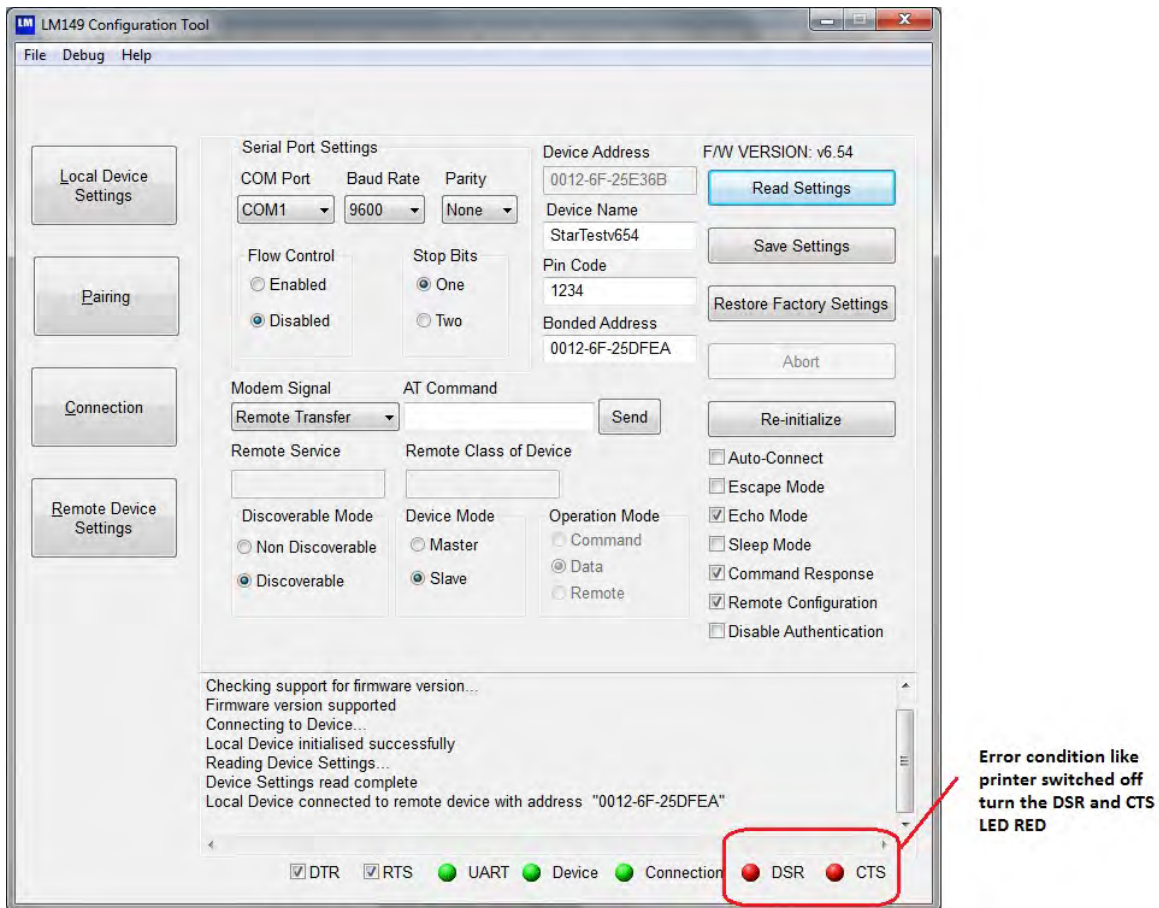
5 DSR line toggling

The DSR line toggling can be checked with LM149 Configuration Software or other programs like [Hercules Setup Utility](#) which is a serial terminal program which also gives status of DSR, CTS line. The below description uses LM149 configuration Software to show DSR line status toggling.



Connection Successful

When an error condition occurs like printer powered off, cover open or out of paper etc, the DSR, CTS lines turn RED as shown below.



Error Condition: DSR line turns RED

6 Troubleshooting

There might be cases when the pair of adapters is unable to communicate with the printer in the expected way. Possible problems could be:

- Bi-directional communication cannot be established
- DSR/CTS status is not transmitted to the remote side

In the above cases check the following points

1. Check the adapter firmware version using the LM149 Software or sending `AT+VER\r` command through hyper-terminal or any other serial terminal program. The above description is valid for firmware v6.5x serial. The production firmware at the time of releasing this document is v6.54. DSR line status via Bluetooth is not supported by v4.5x series, v4.22 or RACv1.03 firmware. For adapter firmware version v4.6x series contact support@lm-technologies.com
2. Make sure the adapter serial settings match with printer serial settings and same on the POS software or PC side, otherwise data communication may not take place
3. Make sure the modem signal status is Remote Transfer otherwise DSR status may not be transmitted via Bluetooth to the other side

4. Make sure the printer supports DSR line toggling when error condition occurs. Check the printer manual for this information
5. If serial settings match, try changing slide switch position. Try all the combination for slide switch. Atleast one should work
6. Make sure the adapter configuration is correct as shown in [Section 3](#)

If none of the above work, please email support@lm-technologies.com with a detail description of the setup and problem.