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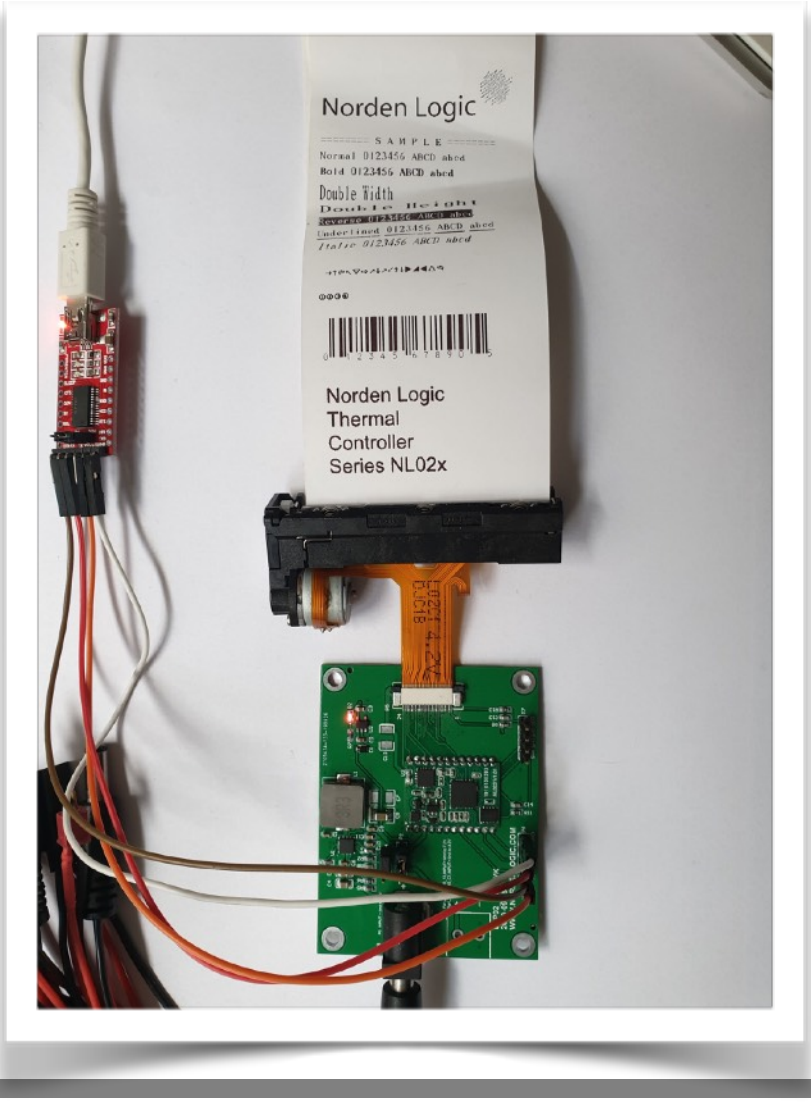
Doc: 1.0.1

This document describes how to use the Norden Logic evaluation board LTP02_245_EVK together with our Printerevk evaluation software and user supplied USB-to-TTL dongle.

Parts required to use the EVK board:

- Power supply between 7.2V and 12V supporting a minimum of **6Amp** of current
- Serial Dongle PC: **USB-to-TTL** e.g. based on FTDI232 OR CP2102 ***NOT RS232**
- Seiko LTP02-245-C1 (4.2V) Low Voltage 58mm print head
- Seiko LTP02-245-13 (7.2V) 58mm print head
- PRT PT48DS-B
- PRT PT48D-HLV-C
- WinsPu TP2PX
- WinsPu TP2VX
- Seiko recommended **high quality** 58mm thermal paper roll



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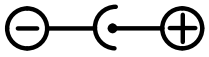
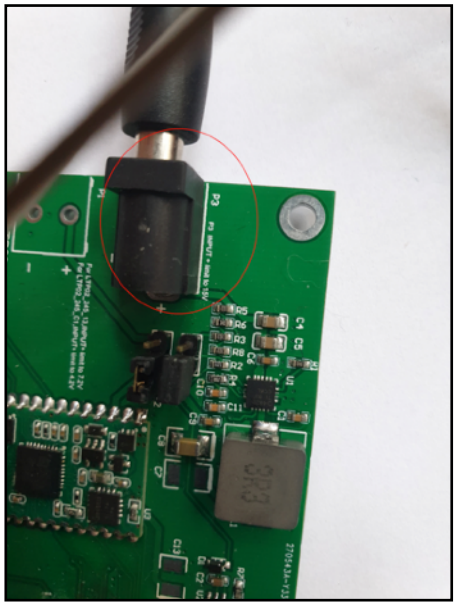
Our EVK board is designed so as to test both the LTP02-245-13 (7.2V) print head and the LTP02-245-C1 4.2V head. The type of head connected can be set in flash in the controller via ESC/POS command or using our Printerevk Test software. Care must be taken that the correct jumper setting is used on the board as to have the correct voltage for the selected print head.

Power connectors:

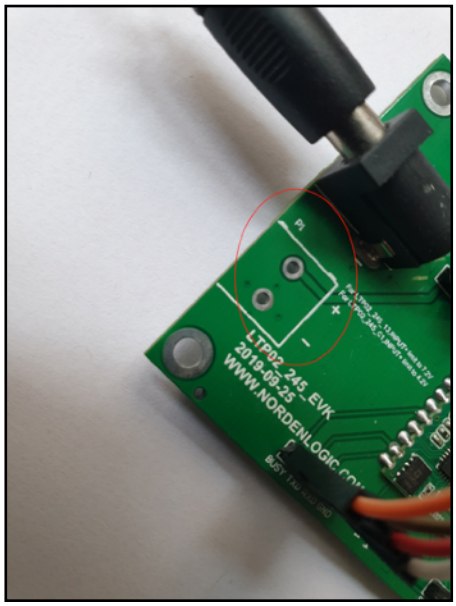
There are 2 power input connectors on the EVK board. P3 and P1. P3 should be used with a regulated power supply in the range of 7.2V up to 12V with a minimum of 6Amp of current. The on-board IC manages the output voltage level for the print heads.

P3 polarity is centre positive: 

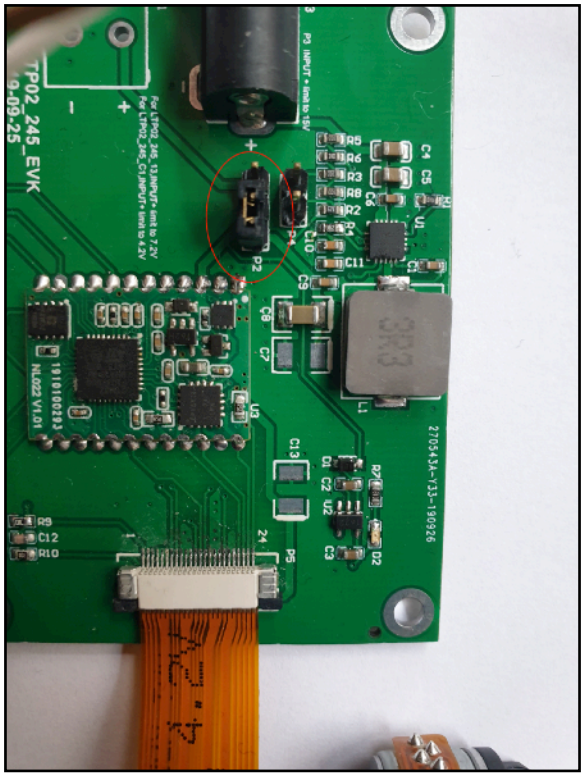
Power Port P3:



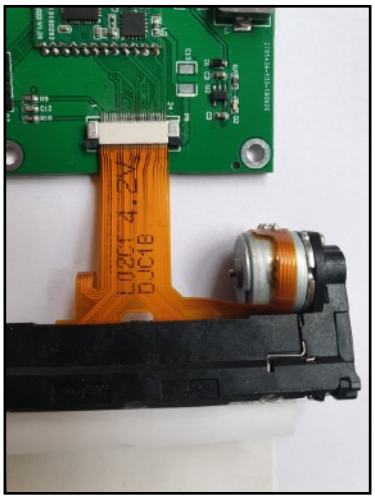
Power Port P1:



Power port P1 allows for the developer to provide his own power circuitry and has not protection and is a direct power interface to the chip. Extreme care must be taken not short circuit the board when using this power input port. In order to enable the P1 power port the jumper P2 must be placed onto the first 2 pins close to the P3 power connector. By default the board is configured to use P3 power port.



In order to have an easier paper path for testing with the LTP02-245 print heads we mounted the connector as in the photo below. Please make sure that when inserting/mounting your print head that the printer ends up having its stepper motor as shown on the photo.



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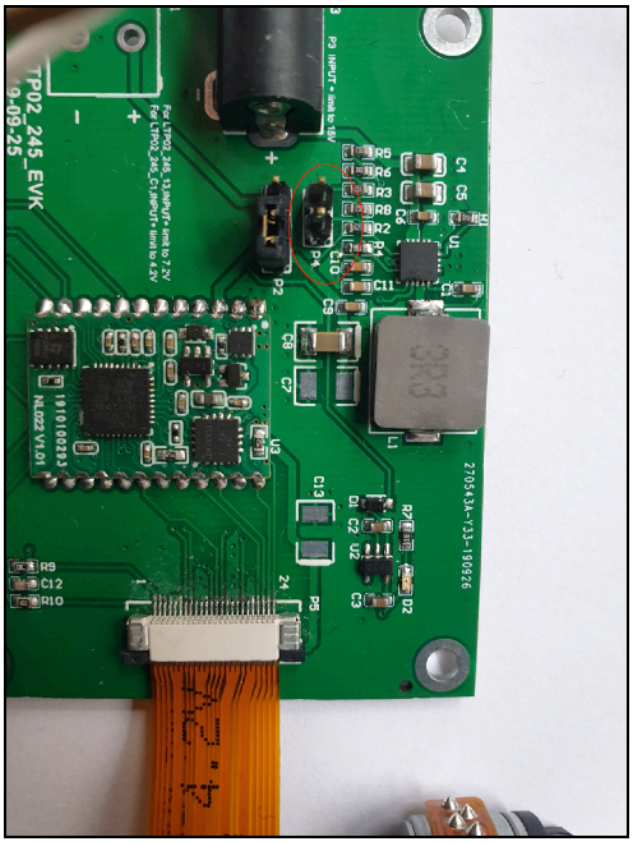
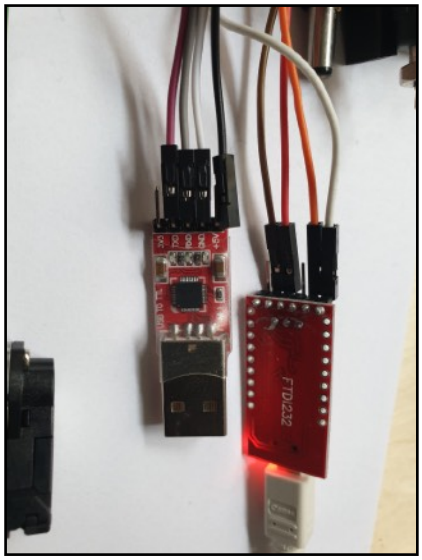
If you are using the default P3 power port then you must pay attention to the jumper P4. By default the board is shipped with P4 open (no jumper) and regulates the print head voltage to 4.0V - for the LTP02-245-C1 Low Voltage print head. For testing the LTP02-245-13 7.2V print head a jumper needs to be placed onto P4. **IMPORTANT: When switching back from testing LTP02-245-13 to the LTP02-245-C1 the jumper MUST BE REMOVED!**



In order to communicate with a PC a user supplied Serial USB-to-TTL dongle must be provided and wired accordingly to the EVK communication pins. Below are 2 examples of the most common USB-to-TTL dongles on the market. **Important: DO NOT USE RS232 DONGLES!**



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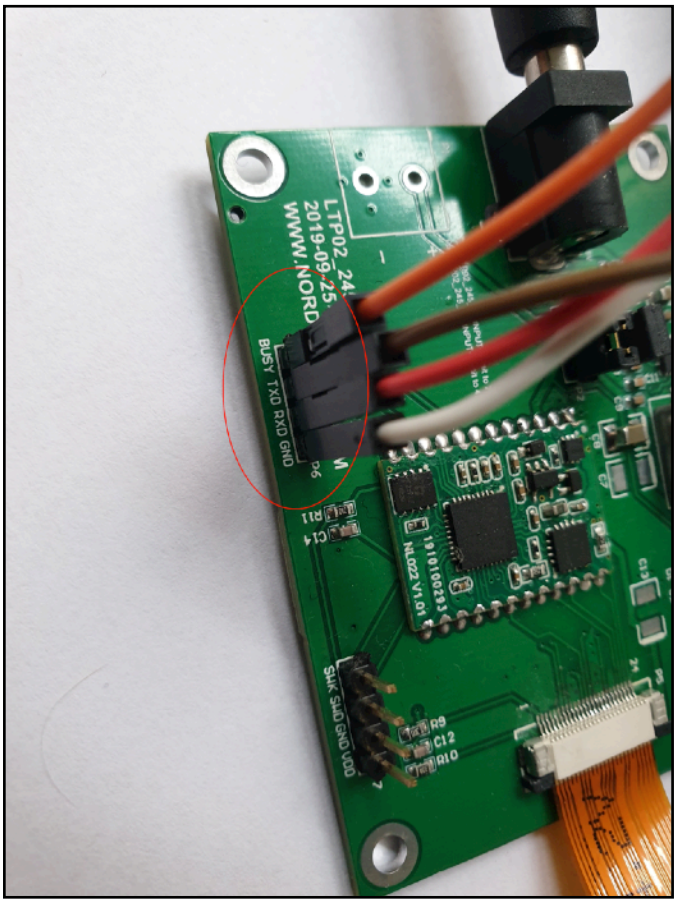
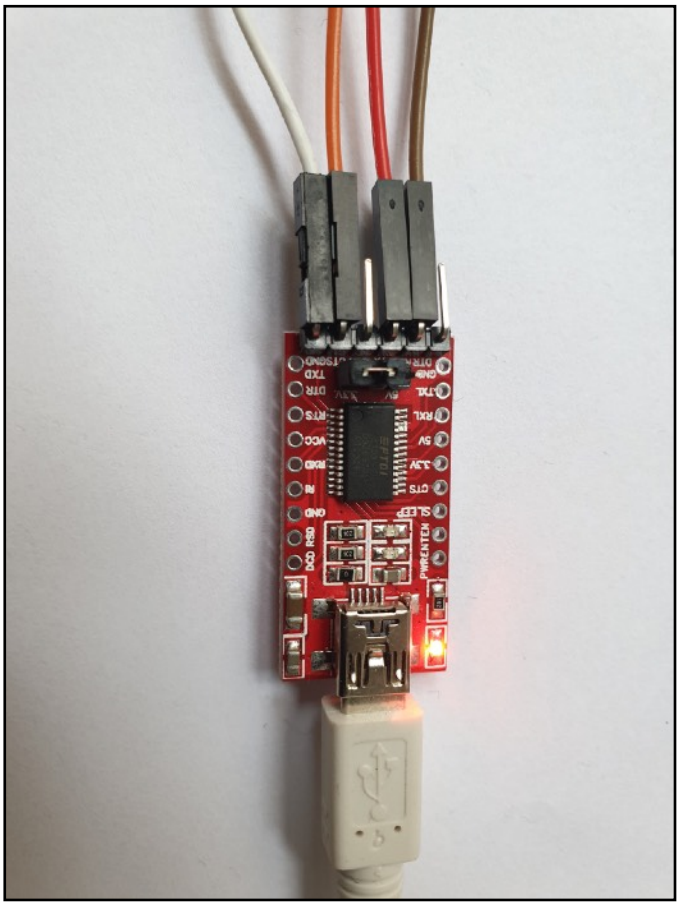
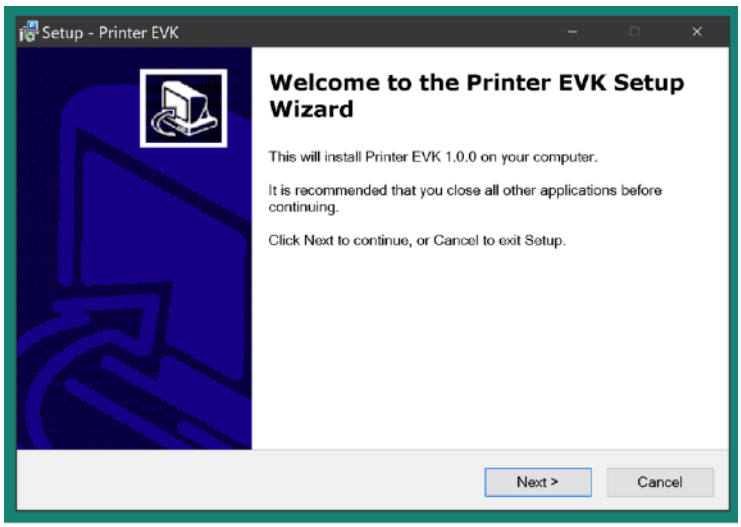
Please connect the TX, RX, GND and RTS wires from the dongle to the P6 pin bank.
Important to note is that the dongle TX goes to the RX of the EVK board, the dongle RX goes to the TX of the EVK board. GND goes to the same on both. If your board supports RTS/CTS connect the EVK RTS line to the pin you will read the line to be set high or low for hardware flow control. In case your dongle has only TX, RX, GND that is no problem because NL022 has by default XON/XOFF software flow control enabled for preventing data loss when printing.





After everything is connected and set up on the hardware side - please still add paper to the print head, then the evaluation software Printerevk should be installed on a Windows PC (a Linux and Mac version will be released shortly).
Printerevk comes with a Windows Setup program which installs all components needed for testing. Just follow the wizard for installation.



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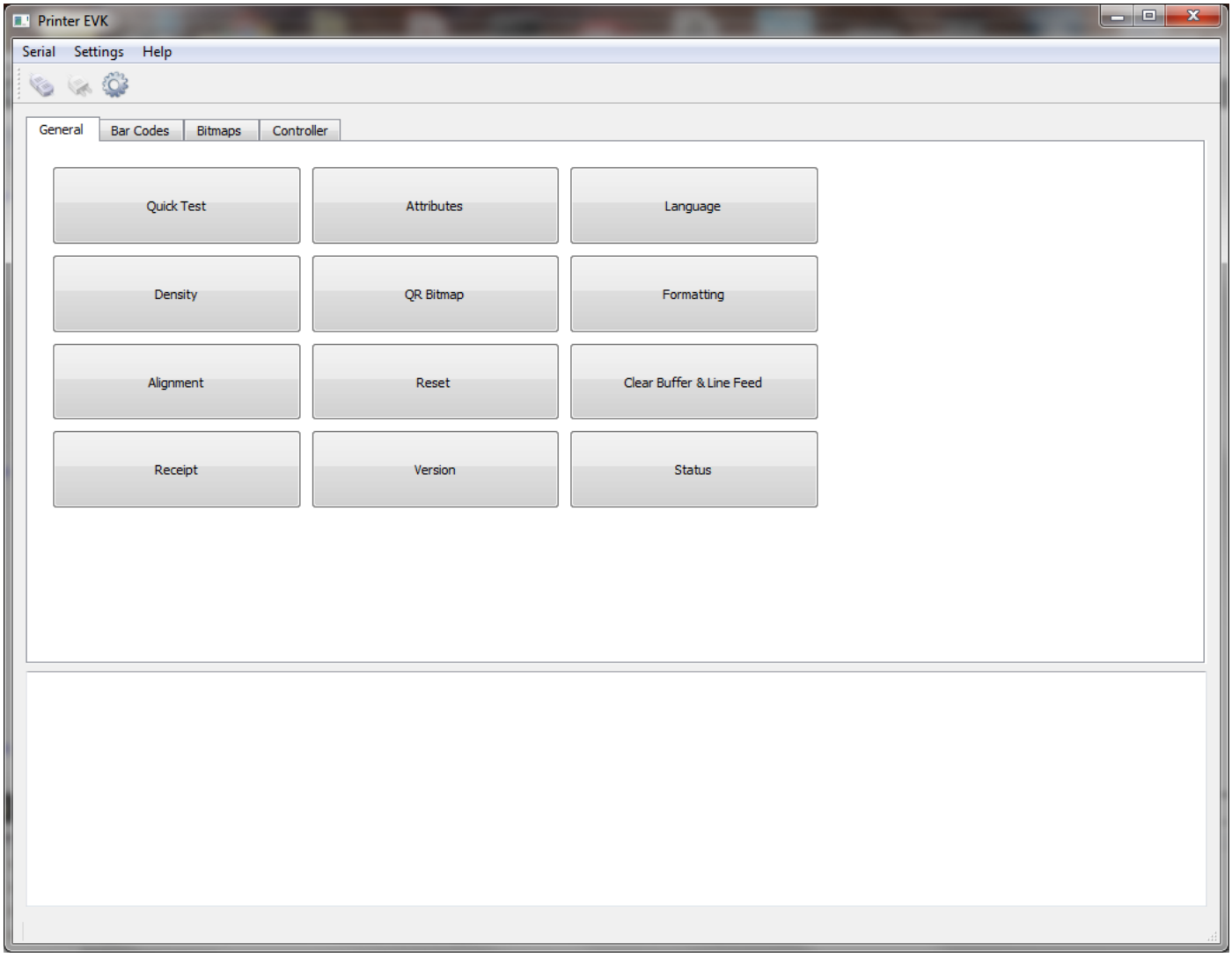
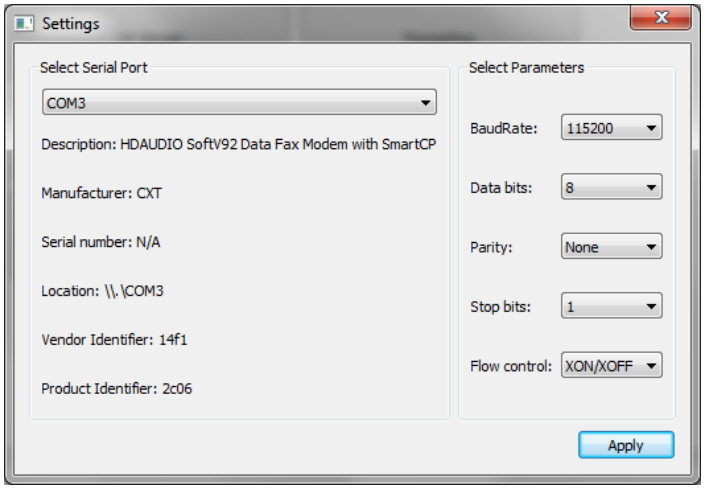
Make sure you have installed the drivers for your Serial USB-to-TTL dongle before starting to test the EVK board and you are confident the dongle is operational.



Printerevk comes with UART serial settings preset as a default, 115200bps and xon/xoff enabled. You can review these settings but all you need to do is click apply and go and connect to the EVK board using the connect option in the menu or toolbar.



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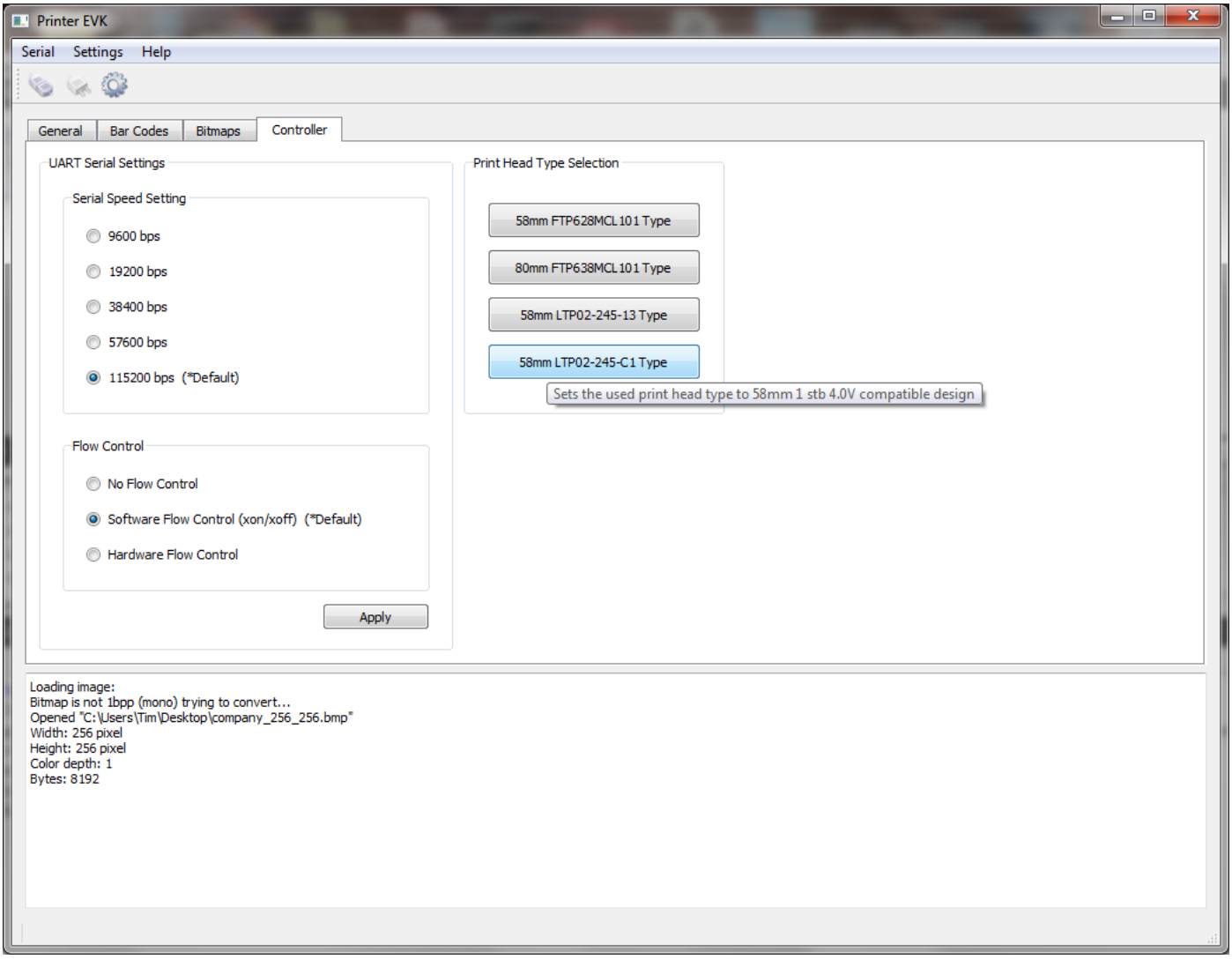
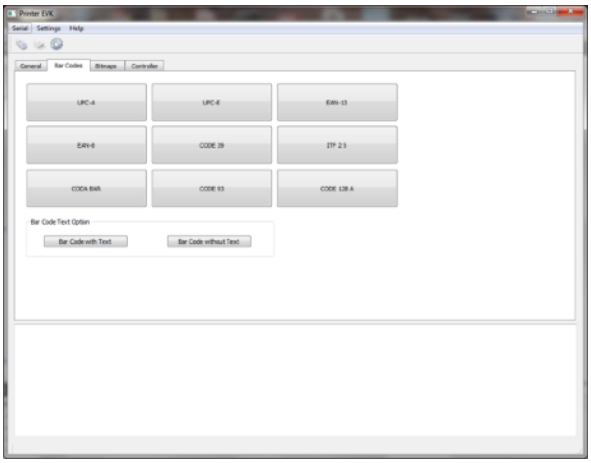
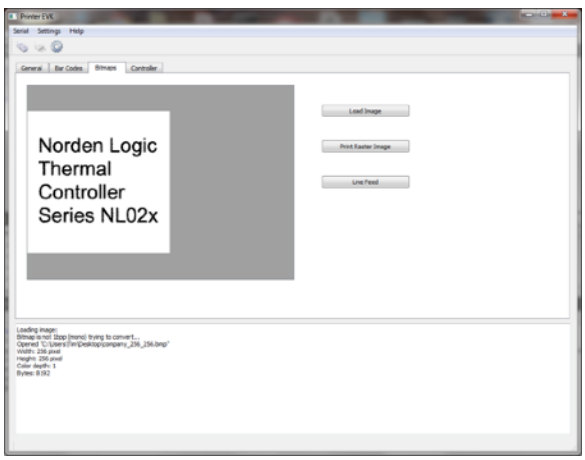
Once you are connected the very first thing you should do regardless if the board has been configured before is just to set the EVK again to the print head you have connected. You find this option in the Controller tab.



After that you are ready to run all the tests available within the software. Below examples of the screens:





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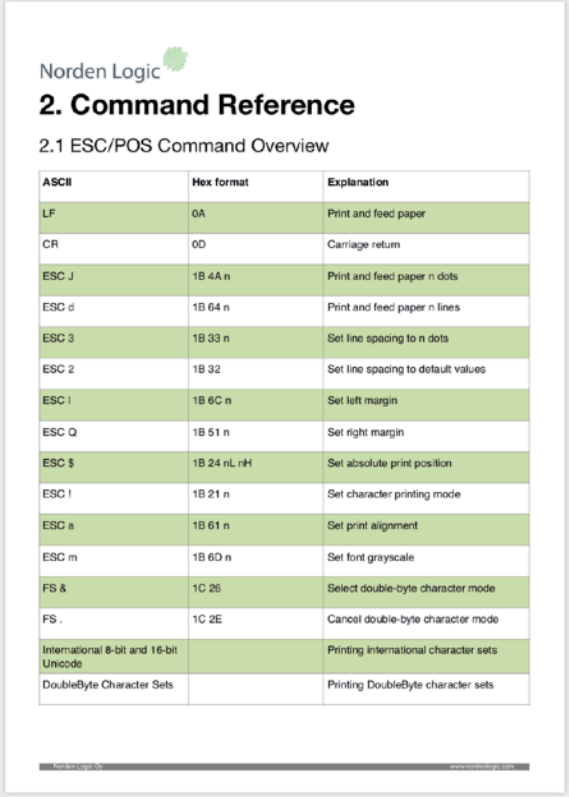
Helpful together with the software tool is also having a look in the ESC/Pos documentation and/or the provided ready to use and integrated C source library files:



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2. Command Reference

2.1 ESC/POS Command Overview

ASCII	Hex format	Explanation
LF	0A	Print and feed paper
CR	0D	Carriage return
ESC J	1B 4A n	Print and feed paper n dots
ESC d	1B 64 n	Print and feed paper n lines
ESC 3	1B 33 n	Set line spacing to n dots
ESC 2	1B 32	Set line spacing to default values
ESC l	1B 6C n	Set left margin
ESC Q	1B 51 n	Set right margin
ESC $	1B 24 nL nH	Set absolute print position
ESC !	1B 21 n	Set character printing mode
ESC a	1B 61 n	Set print alignment
ESC m	1B 6D n	Set font grayscale
FS &	1C 26	Select double-byte character mode
FS .	1C 2E	Cancel double-byte character mode
International 8-bit and 16-bit Unicode		Printing international character sets
DoubleByte Character Sets		Printing DoubleByte character sets

```
Write(const uint8_t* buf, size_t buflen)
*/

#include <stdio.h>
#include <stdint.h>
#include <stdlib.h>
#include <stddef.h>
#include <ctrl.h>
#include <unistd.h>

#include "nl02x.h"



/* ************************************************************************
 * Write wrapper
 * ************************************************************************ */
static void Write(const uint8_t* buf, size_t buflen)
{
    //Implement here your own function body for writing to
    //your serial port - UART
}

/* ************************************************************************
 * Set serial communications parameters
 n=0 9600bps n=1 19200bps n=2 38400bps n=3 57600bps n=4 115200bps
 m=0 No Flow Control  m=1 *Default Software Flow Control (xon/xoff)
 m=2 Hardware Flow Control RTS/busy=1 Host Stop Send Data RTS/busy=0 Host Send Data

  Default is n=4  115200  m=1 xon/xoff
 * ************************************************************************ */
void setComMode (unsigned char ucComSet, unsigned char ucFlowSet)
{
    uint8_t buf[4] = {0x1D,0x28,0x03,0x30};//GS ( n m
    buf[2] = ucComSet; // 0,1,2,3,4
    buf[3] = ucFlowSet; //0,1,2
    Write(buf,4);

}

/*
Set connected Print Head. Option is saved into flash
n= 0  MM58_FTP628MCL101   58mm 6 stb 7.2V compatible designs *default value
n=1   MM80_FTP638MCL101   80mm 5stb 7.2V compatible designs
n=2   MM58_LTP02_245_13   58mm 1stb line 7.2V designs
n=3   MM58_LTP02_245_C1   58mm 1stb line 4.0V designs
*/
void setPrinterHead(unsigned char ucHeadIndex)
{
    unsigned char buf[3]  = {0x1B,0x5A,0x00};//ESC Z n
    buf[2] = ucHeadIndex;
    Write(buf,3);
}


/* ************************************************************************
 * Printer ESC/POS init command
 * ************************************************************************ */
```