UM1952
User manual

STSW-L9779WD-SPI Graphical User Interface (GUI) for EVAL-L9779WD-SPI

Introduction

This document describes the STSW-L9779WD-SPI Graphical User Interface (GUI) that allows to initialize and control the EVAL-L9779WD-SPI evaluation board by changing parameters through the SPI protocol, manage the parallel PWM input and read the output.

The GUI has been developed by using LabVIEW® and it uses, as microcontroller interface, the SPC563M-DISP Discovery+.

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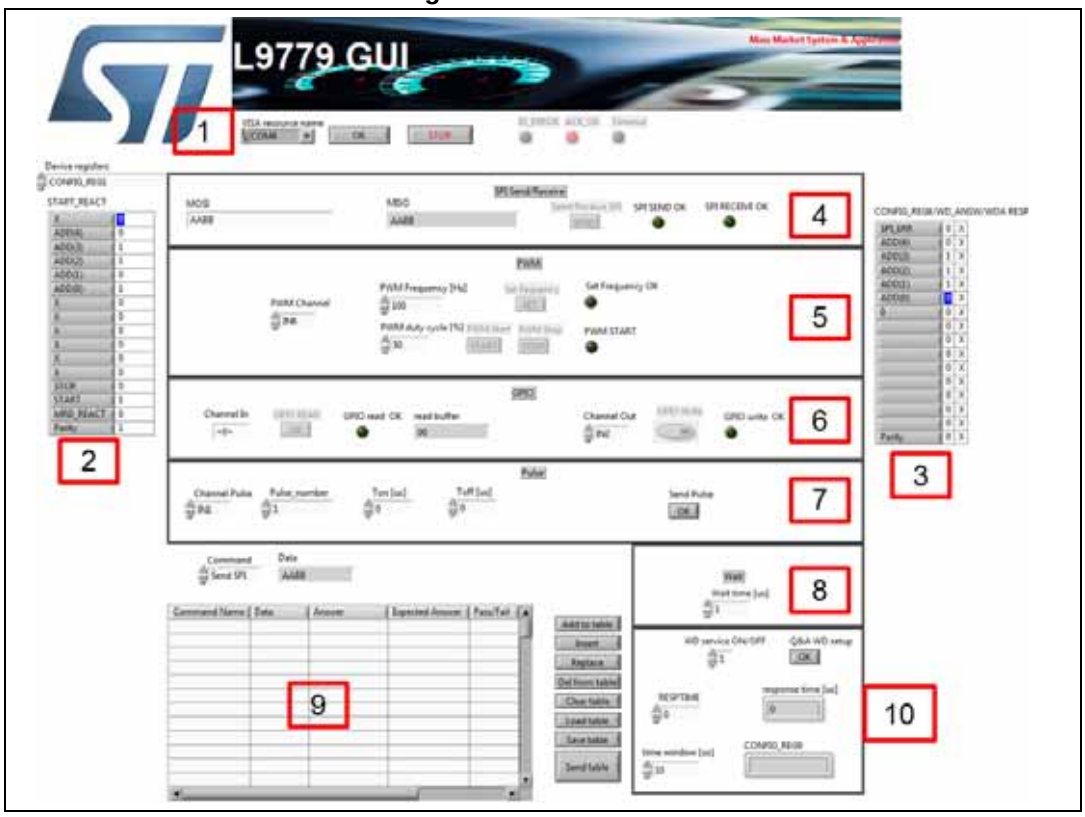
1 Graphical User Interface description

The GUI is composed of ten fields:

Figure 1. GUI interface



1. **Port Setup**: selects the microcontroller port.
2. **MOSI**: selects the specific device register and setup the required value.
3. **MISO**: reads the SDO register of the device.
4. **SPI Send/Receive**: by pushing the [SEND] button the user can:
   - send the SPI command configured in the MOSI menu (menu 2)
   - send an SPI command manually written in the MOSI field.
   - read the device answer MISO. The two LED, SPI SEND OK and SPI RECEIVE OK are used to feedback on the SPI communication (led means communication is used to provide feedback on the SPI communication (the green led means the communication)
5. **PWM**: setups the Frequency and the Duty cycle of seven PWMs (IN5, IN6, IN7, and IGNIx). By pushing the [START] button, the PWMs start, by pushing the [STOP] button

the PWMs are stopped. Before sending a PWM, the selected Frequency must be confirmed by pushing the [SET] button.

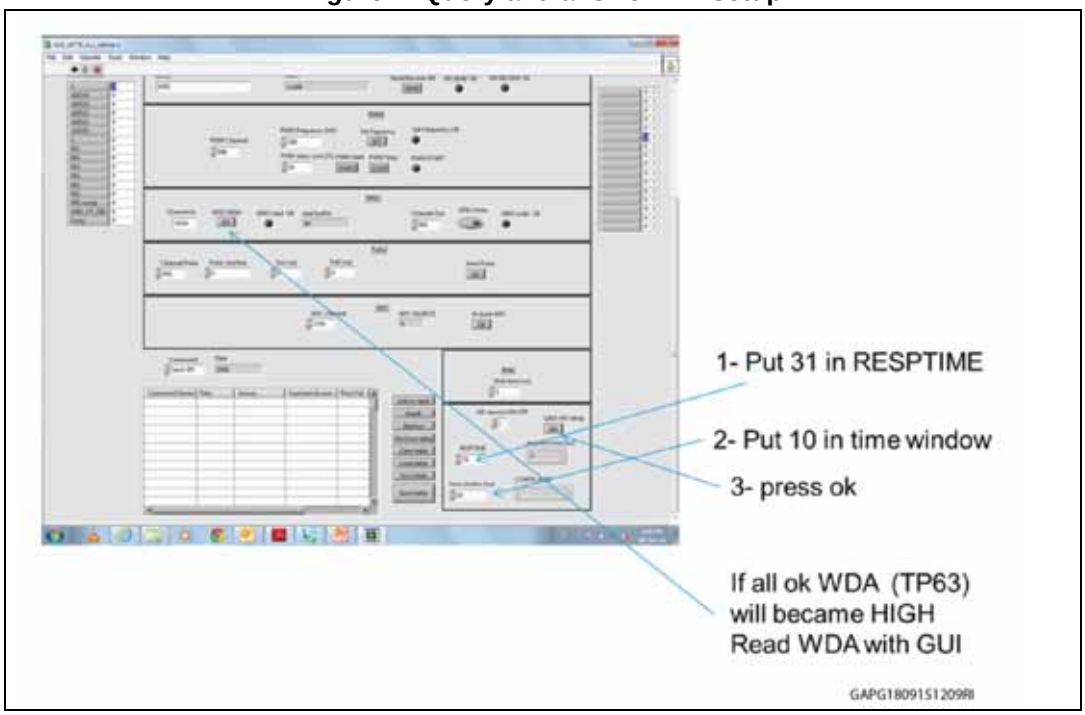
6. **GPIO:** this field allows the user to read the value of WDA pin and control IN1, IN2, IN3IN4 LOW or HIGH
7. **PULSE**: using this field it is possible to generate a pulse train of a predetermined number and duration on IN1, IN2,IN3, IN4 and PWM(IN8) pins.
8. **Wait:** the user chooses a wait time to be inserted in table 9 (see *Section Figure 1.: GUI interface*) allowing a timing of command inserted in the table
9. **Table:** it is used to schedule a set of command to be sent to L9779WD-SPI: SPI read/write, GPIO read/write, WAIT time. It's possible to setup up to 100 lines of command, then save and reload. The uController executes each command in real time, and after the execution the results is sent back to GUI.
10. **Watchdog pane**: setupd the watchdog windows according to the description of *Multifunction IC for engine management system (see Section A.1: Document references).*

2 Running procedure

The Start sequence is the following:

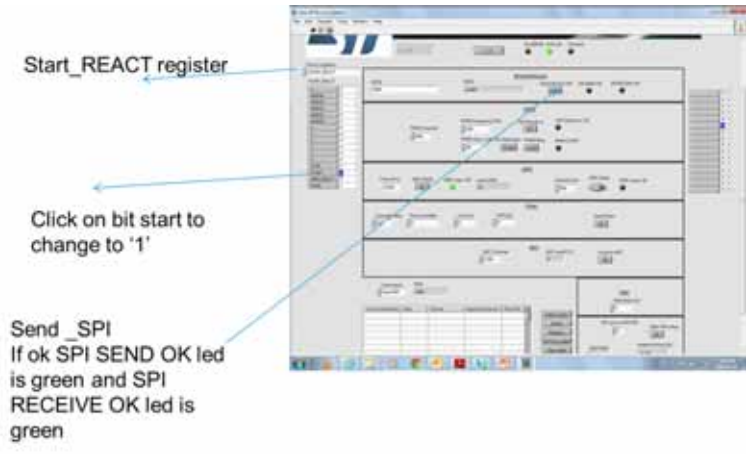
1. Configure the COM port
2. Press “OK”
3. Start the WatchSdog following procedure:
   – Select 31 in REPTIME
   – Write 10 µs in time windows
   – Press OK if the procedure result is positive, WDA becomes HIGH (you can check the value by GUI clicking on GPIO read or using multimeter or oscilloscope connected on the board at TP63).

Figure 2. Query and answer WD setup



4. Start the device:

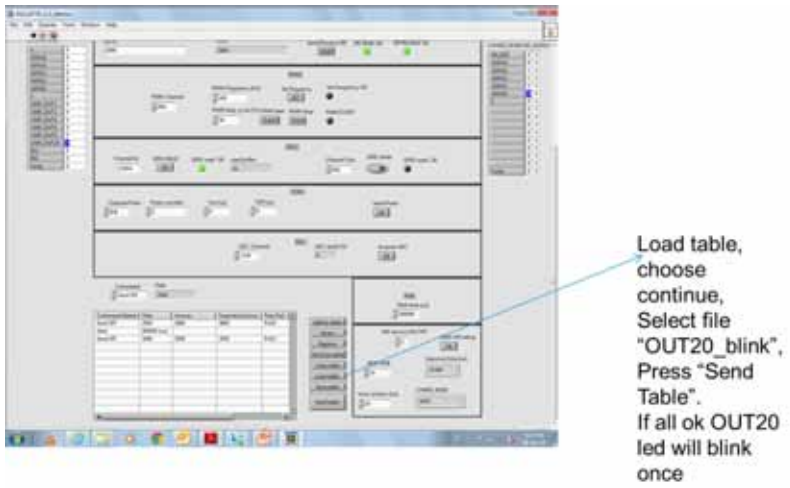
Figure 3. Start_REACT register setup



Example 1)

OUT20 led blinking using table load (see *Figure 4*).

Figure 4. Load table example

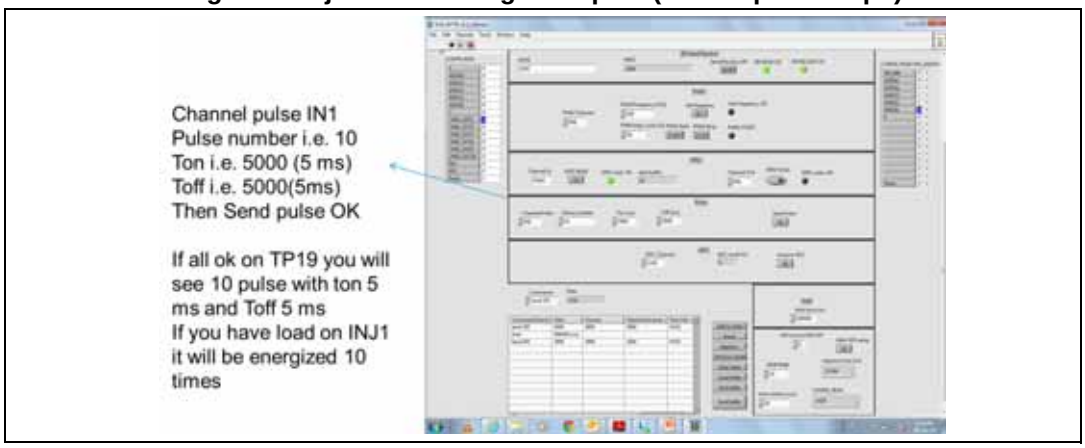


Example 2

INJ1 PWM action[(a)]

a. The time is expressed in µs.

Figure 5. Injector 1 driving examples (time expressed µs)



3 Labview driver installation guide

The GUI can be used standalone without a license, but installing the free Runtime Engine for Labview 2013 and the most updated VISA Runtime that you can find on National Instruments web site.

4 How to load general purpose fw on SPC56M-discovery

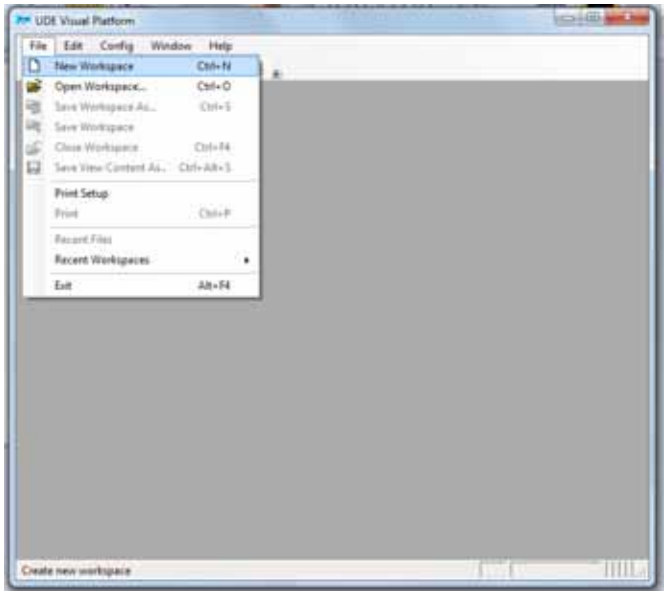
To use the GUI the discovery board SPC56M-Discovery+ must be programmed with the dedicated Firmware (L9779WD-SPI.elf).

This is the procedure to program the SPC56M-Discovery+ using the ST toolchain based on SPC5-UDEDEBG

1. Start UDE Visual Platform 4.0from http://www.st.com/web/catalog/tools/FM147/CL1794/SC1809/SS1821/PF258176

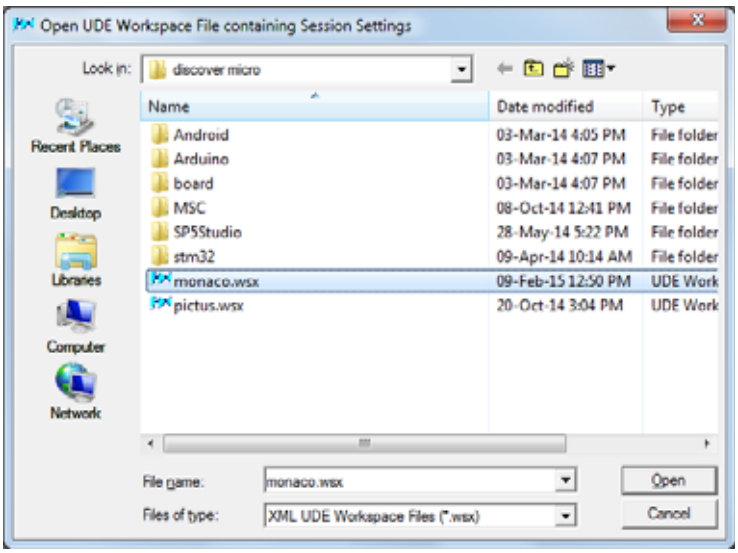
2. Creating a New Workspace for SPC56M. Click *File>New Workspace*

Figure 6. New workspace



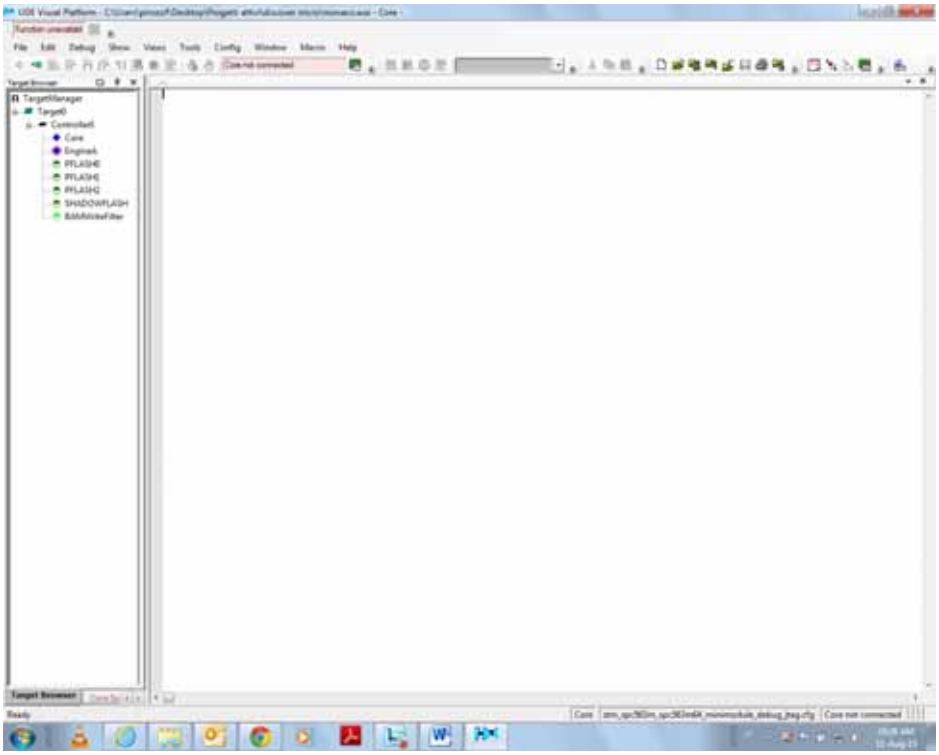
3. Naming the new Workspace i.e. Monaco and select OPEN.

Figure 7. Monaco.wsx workspace loading



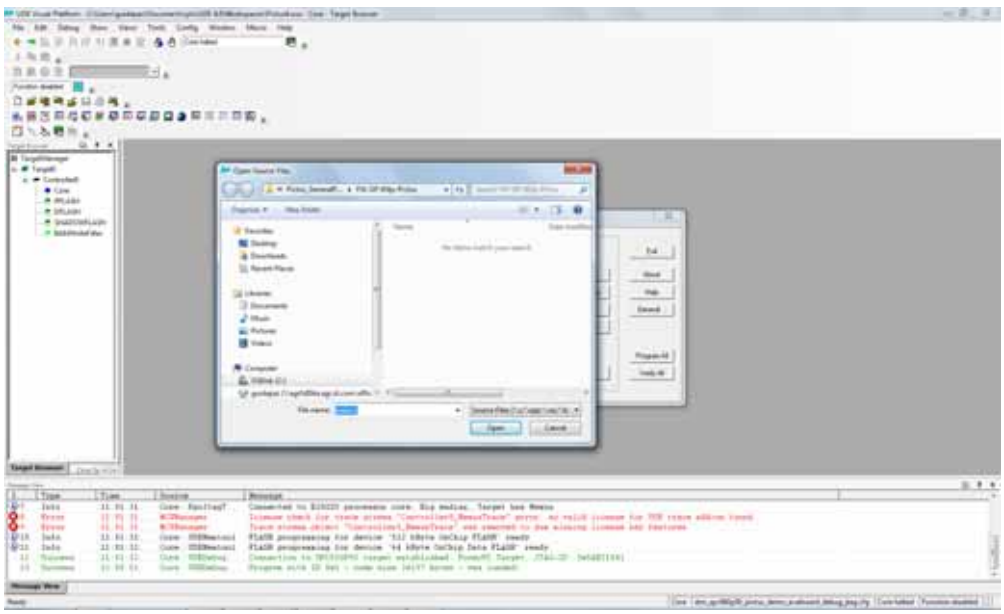
4. UDE Visual Platform 4.0 is refreshed and new functionalities appear, then click on “Load Program” (or File/LoadProgramm)

Figure 8. Monaco workspace appearance



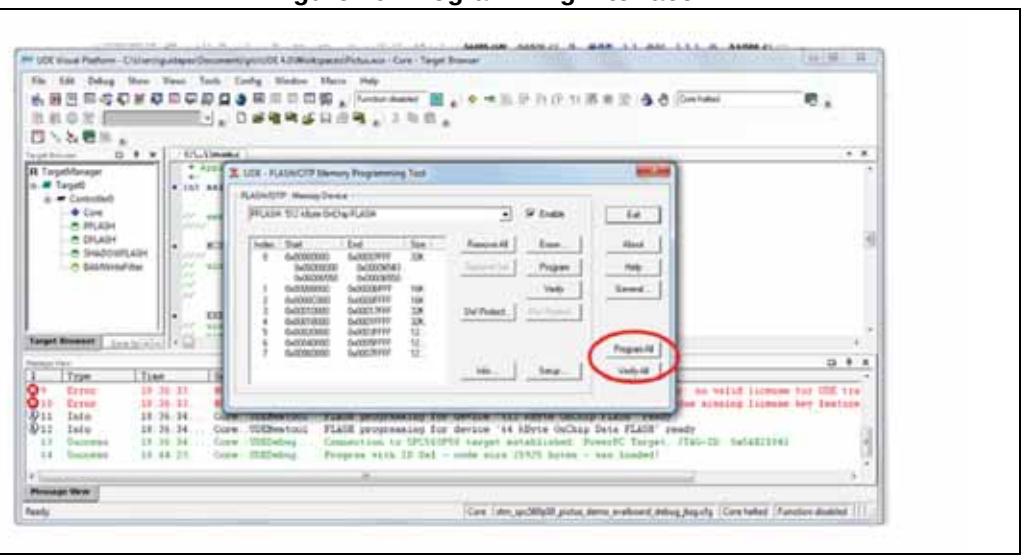
5. Browse the file “L9779WD-SPI.elf “click “Open”.
6. In the next windows click on “Cancel”.

Figure 9. File L9779WD-SPI.elf loading



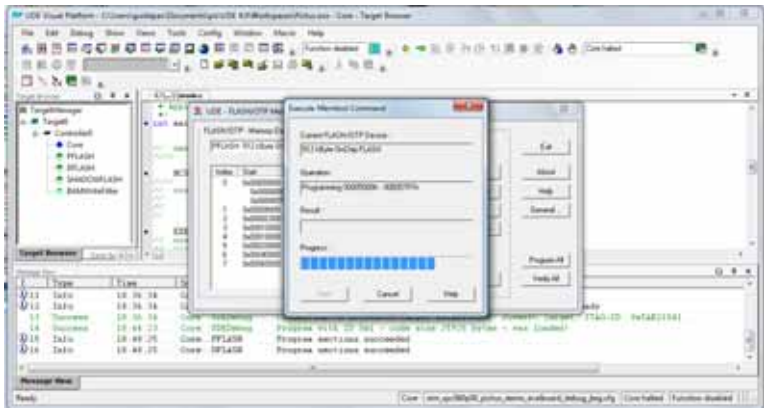
7. Then “Program All”.

Figure 10. Programming interface



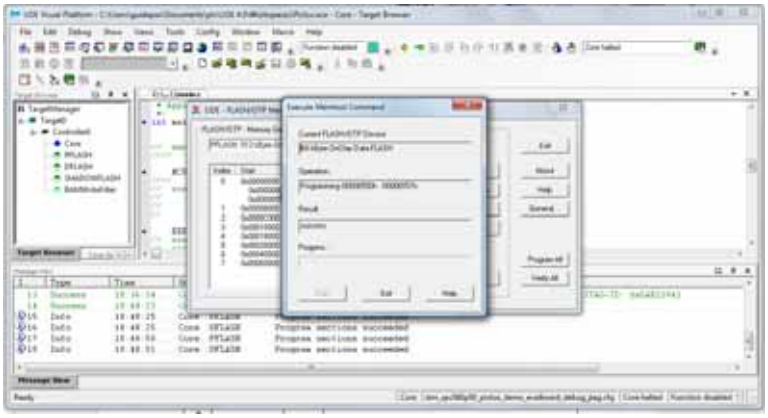
8. The UDE Visual Platform 4.0 starts to load the program.

Figure 11. FW Upload process in execution



9. When the procedure click on “Exit” on all windows

Figure 12. End of FW upload process



10. In order to connect to microcontroller board a RS232 cable is needed. In case your PC has not COM portan adapter (i.e. USB-RS232) is needed. For the installation please refer to the documentation. The cable has to be connected to the COM0 port of SPC56M-Discovery .

Appendix A Further information

A.1 Document references

- *Multifunction IC for engine management system* (L9779WD-SPI, DocID027721).

Revision history

Table 1. Document revision history

Date	Revision	Changes
20-Jan-2016	1	Initial release.
11-Feb-2016	2	Updated title. Added RPN STSW-L9779WD-SPI in Introduction. Deleted in *Chapter 1* and *Chapter 3* L9979WD-SPI.