# QuickStart Guide
YRPBRL78L12

RENESAS

1. Installation

The installation of the demonstration files and GUI will be automatically performed by the DVD installer. If the DVD does not autostart, please run the "Setup" executable file on the DVD and follow the directions for the installation. Please note that the user will require administration rights to the host PC in order to install the demonstration and tool software.

2. Connection
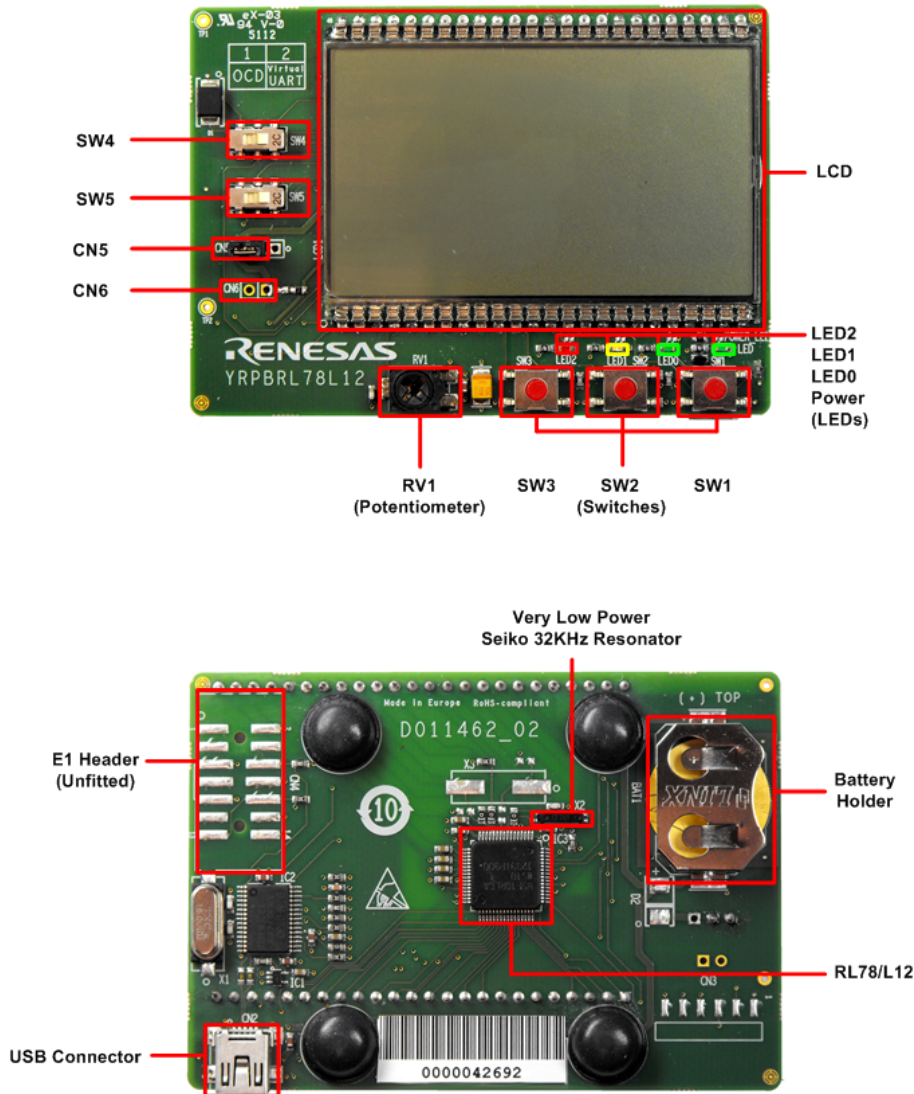
1. First ensure that a jumper is fitted on CN5 and that the *YRPBRL78L12* LCD promotional board's function switches are configured as shown below.

Switches	Position
SW4	2
SW5	2

2. Next connect the *YRPBRL78L12* LCD promotional board to the host PC using the USB cable provided and when the LCD board is connected, the Power LED should be on, indicating that power is supplied to the *YRPBRL78L12* LCD promotional board.

3. If this is the first time the LCD board is connected to the host PC, the drivers will be installed automatically. Accept any permission dialogs that arise. On completion the driver should be "Renesas Starter Kit Virtual UART". This can be verified by in the Device Manager and note the "COM" port assigned to the *YRPBRL78L12* LCD promotional board.

3. Starting the Demonstration

To start the demonstrations ensure that the LCD board is connected and the virtual UART driver has been successfully installed. The Demonstrations are controlled by the *YRPBRL78L12* GUI which can be started from the "Start => All Programs" menu or from the icon on the desktop.


The GUI will automatically detect the com port for the *YRPBRL78L12* LCD promotional board and start the GUI. If for any reason this does not happen, please select the appropriate port number from the drop down list, and then press the "Connect" button on the GUI start window.

Caution

Before running the GUI please ensure that the display settings are set to 1024x768 minimum resolution (96 Dpi) for appropriate GUI layout.

The appropriate port number should be detected automatically and proposed as default when opening the GUI Demo. It is important to ensure that the virtual UART is working properly by checking the Windows Device Manager – no question mark should be displayed on the virtual UART.

The GUI should now be connected and running. LED1 should now be blinking and the billboard image on the GUI will change every 5 seconds.
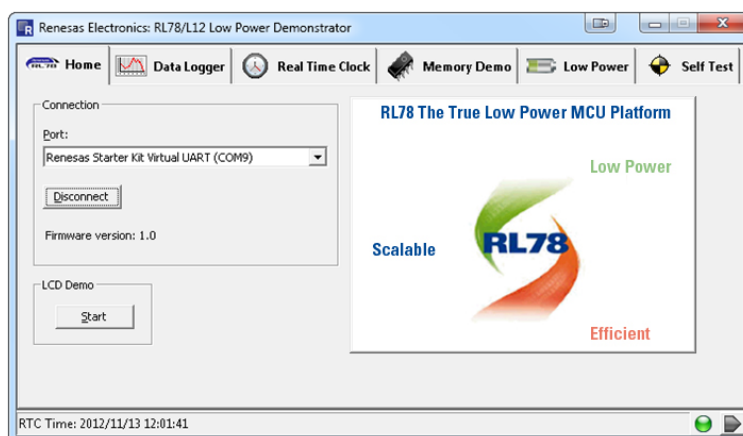
4. Demonstration Summary

The demonstration GUI provides a number of demonstrations of the key RL78/L12 functions.

Home tab

The Home tab lists available ports and a button to connect to the *YRPBRL78L12* LCD promotional board via the available virtual UART port. It also includes a simulation of an air conditioning system. The potentiometer on the *YRPBRL78L12* LCD promotional board is used to vary the temperature between from 0 ºC to +40 ºC. With the temperature from 10 º C and below 30 º C, the system is in good working condition. When the temperature falls below 10 ºC, the heat symbol is turned on indicating the need to increase the temperature. The word 'COLD' is also displayed. When the temperature reaches 30 º C or above, the cool symbol is turned on, indicating the need to decrease the temperature. 'HOT' can also be seen on the screen. Click "Stop" on the dialog to exit the simulation.

Real Time Clock tab

The RL78/L12's internal RTC can be synchronized to the host PC clock (click on the "Sync" button). Also the RTC interval interrupt and Alarm clock wake up can be set by the GUI.

Memory Demo tab

In the memory tab, there is a feature to enable and disable DMAC transfers of the external voltage and internal temperature in hex format. Enabling DMAC transfers automatically enables cycling redundancy checks (CRC) on the transferred values which are displayed in the Memory Content view.

Testing of the read and write feature of the on-board RAM can also be verified. Click "Write" to set the bytes to the value specified in the input boxes, and "Read" to read the written values from the MCU.

Low Power tab

The Low Power modes of the RL78/L12 can be entered by clicking on the HALT, STOP or SNOOZE buttons. Clicking the "Release" button on the GUI when in HALT and pressing a switch on the *YRPBRL78L12* LCD promotional board when in STOP mode, will return the RL78/L12 back to Run mode (normal operation).

To enter the SNOOZE mode, click on the "SNOOZE" button after selecting the trigger and voltage limit conditions. Adjust the potentiometer (using the provided potentiometer shaft) to a voltage outside the range specified, to wake up the device (Note this is the only method of waking the RL78 from SNOOZE mode in this demonstration).

The low current consumption can be measured when the low power modes (HALT, STOP and SNOOZE) are selected. Connector CN5 is used for current measurement of the RL78/L12 device. Remove this jumper and connect a multi-meter to these pins (2 and 3), as shown below.

Caution

Connect and turn on the ammeter prior to starting the demonstration.

Make sure there is no short between the terminals.

Make sure the multi-meter is set to measure current.

Set the appropriate range.
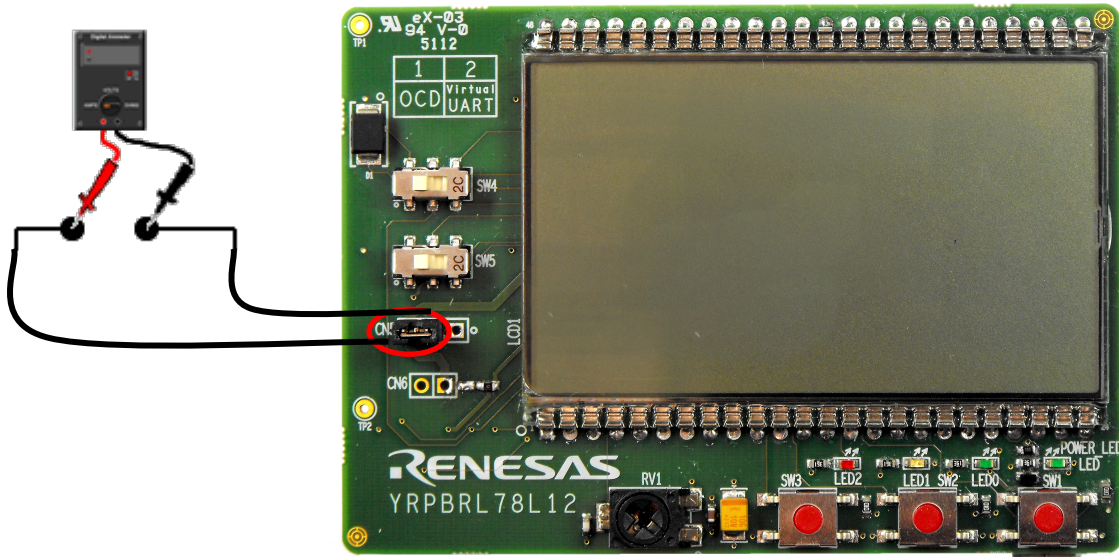
Caution

Current measurements can be from uA to mA. Some multi-meters disconnect when the range is changed. This will interrupt the voltage supply to the MCU, resulting in a MCU reset. It is recommended that the GUI is disconnected from the *YRPBRL78L12* and remove the power supply. The appropriate range can then be selected on the multi-meter before re-connecting the *YRPBRL78L12* LCD promotional board to the host PC and re-starting the GUI.

Each power mode enables and disables different MCU peripherals. The fewer peripherals enabled, the lower the MCU's current consumption will be.

Power Mode	CPU	24 MHz	32 KHz	UART	Timer	ADC	RTC	LVD	Flash	RAM	LCD
RUN	On	On	On	On	On	On	On	Off	Off	On	On
HALT	Off	On	On	On	On	On	On	Off	Off	On	On
STOP	Off	Off	On	Off	Off	Off	On	Off	Off	On	On/Off
SNOOZE	Off	Off	On	Off	Off	On (periodically)	On	Off	Off	On	On

Self Test tab

The Self Test tab includes the following features:

- Test of the user switches
- Test of the CRC
- RAM & SFR Guard Test

Switch Test
By clicking the "Enable" button in the switch test section, the GUI will poll the user switch status. If a switch is held down, the corresponding switch indicator will change from green to red. Switch SW3 is configured to measure the period it is held down and the measured period is displayed on the *YRPBRL78L12*'s LCD panel.

Guard Test
Select either RAM guard or SFR guard then click the "Enable" button to turn on the selected guard function.
RAM guard prevents writing to the 8-bytes of memory shown in the Memory Demo tab. SFR guard disables writing to the register used to toggle LED1.

CRC Test
By clicking the "Enable" button, the GUI will carry out a cyclic redundancy check of the values it receives in the Memory Content view under the Memory Demo tab. This can be compared to the CRC value calculated by the RL78/L12 device.

5. Next Step

For more information about any of the demonstrations described above, please refer to the full *YRPBRL78L12* LCD promotional board user manual supplied.

Additional evaluation and development tools are provided as part of this kit.
Additional evaluation tools:-

e^2 studio debugging
The *YRPBRL78L12* LCD promotional board allows for the user to evaluate the debugging capability using the e^2 studio tools supplied with this kit.
Please note that the e^2 studio software needs to be installed and registered in order to use the debugging feature. Please refer to the full user manual for full detail on how to configure the board for debugging.
e^2 studio can be found by following the link below
Start => All Programs menu => Renesas Electronics e2studio => Renesas e2studio

YRPBRL78L12-Demo GUI
This program provides the interface to the *YRPBRL78L12* LCD promotional board from the user's PC.
Start => All Programs menu => Renesas Electronics Tools => YRPBRL78L12 => YRPBRL78L12-Demo

Manuals
User manuals can be found in
Start => All Programs menu => Renesas Electronics Tools => YRPBRL78L12 => Manuals

6. Support

Online technical support and information is available at:

America: www.am.renesas.com/rl78
Europe: www.renesas.eu/rl78
Others: www.renesas.com/rl78
GNURL78 Compiler Support: www.kpitgnutools.com

Technical Contact Details
America: techsupport.america@renesas.com
Europe: http://renesas.eu/ibg-kitsupport
Japan: csc@renesas.com