Gowin_EMPU_M3 Serial Debugging

Reference Manual

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Revision History

Date	Version	Description
04/03/2020	1.0E	Initial version published.
07/16/2021	1.1E	FPGA and MCU software version updated.

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1 Overview

Gowin_EMPU_M3 supports serial port debugging. The master computer communicates with the slave computer by serial ports. Serial debugging assistant software is used to trace the debugging information on the PC side.

2 Hardware Resource

- Development board: DK-START-GW2A55 V1.3
  GW2A-LV55PG484C8/I7
- USB to serial port interface board
- PC

3 Software Resource

- Gowin_V1.9.8 Beta and above
- ARM Keil MDK (V5.26 and above) and GOWIN MCU Designer (V1.1 and above)
- Serial Debugging Assistant Software

4 Reference Design

Gowin_EMPU_M3 provides serial port debugging reference design in ARM Keil MDK V5.26 and above and GOWIN MCU Designer V1.1 and above.

- Gowin_EMPU_M3\ref_design\MCU_RefDesign\Keil_RefDesign\peripherals_app
- Gowin_EMPU_M3\ref_design\MCU_RefDesign\GMD_RefDesign\sm3_peripherals_app

5 Debugging Flow

5.1 Hardware Design

5.1.1 Hardware Design

1. Select Gowin_EMPU_M3 in Gowin IP Core Generator;
2. Configure MCU Core System and APB Bus System, select UART0 or UART1 to generate Gowin_EMPU_M3 hardware design with UART function;
3. Instantiate Top Module, import user designs, and connect user designs with Top Module;
4. Or use Gowin_EMPU_M3 hardware reference design: Gowin_EMPU_M3\ref_design\FPGA_RefDesign

5.1.2 Physical Constraint

Constrain the UART0 and UART1 port in Gowin_EMPU_M3 to FPGA IO.

5.2 Software Programming

Please refer to 4 Reference Design the software programming reference design of Gowin_EMPU_M3 in the software environment of ARM Keil MDK (V5.26 and above) or GOWIN MCU Designer (V1.1 and above).

5.3 Board Level Connection

Connect DK-START-GW2A55 V1.3 development board with USB to serial board, then connect USB to serial board with PC.

Take Gowin_EMPU_M3 hardware reference design in SDK for an instance, the port constraints of UART0 and UART1 are shown in Table 5-1 .

Table 5-1 UART0/1 Port Constraints in Reference Design

UART	Ports	IO
UART0	RXD	AB2
	TXD	AB1

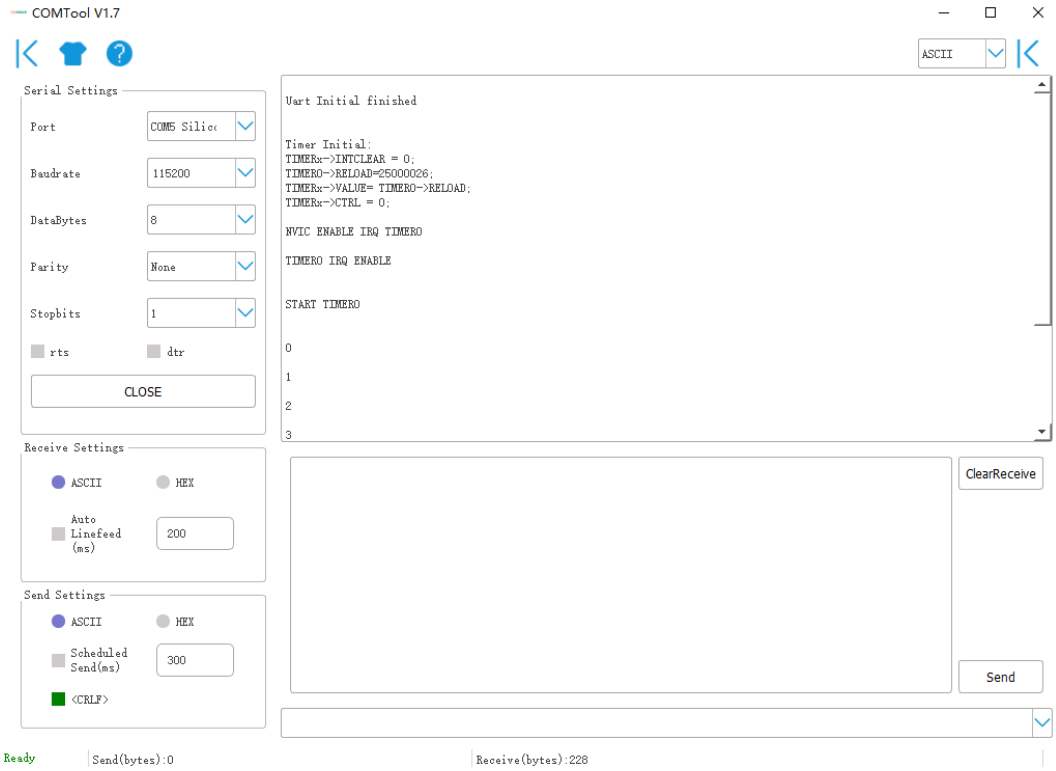
UART	Ports	IO
UART1	RXD	AB3
	TXD	AA3

5.4 Serial Debugging Assistant

Open the serial debugging assistant software, as shown in Figure 5-1 .

1. Refer to the PC device manager to select a proper communication serial port;
2. Refer to the baud rate set in the software programming design to configure the serial port communication baud rate as 115200;
3. The stop bit is set to 1;
4. The data bit is set to 8;
5. No parity;
6. Open the serial port;
7. Development board power-on;
8. The serial port sends and receives debugging information.

Figure 5-1 Serial Debugging Assistant



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