

Failure Mode and Effect Analysis

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Project: PES_5813_Project_5

System: UART Communication with PC and Circular Buffer

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Serial no.	Potential Failure Mode	Potential Failure Effect	Severity (S) (1-10)	Potential Cause	Occurrence (O)	Controls	Detection (D)	Risk Priority Number (S*O*D)
1	Polling mode of the serial communication	Due to the blocking or polling wait, at considerably lower clock speeds the data access is slow and can result in data loss	8	Clock speed determines the rate at which the received/transmit values are accessed in the registers	4	Relying on interrupt modes can help solve this issue as there are no waits involved	3	96
2	Baud Rate Selection	There might be garbage value obtained or junk values. There might be a case where no values are received	10	Improper selection of the baud rates in the PC terminal application or improper baud settings in the UART driver	2	Ensure the baud rate in the PC terminal application matches with the driver settings of the UART	4	80
3	Power Connection failure in KL25Z or PC	The serial communication will fail	10	Loose power cables, Power outage	2	Have proper connectors which avoids loose connection and have power backup sources	3	60
4	Physical Wiring Connections	If the cables/wires are not properly connected then this results in communication failure	9	The cable length might not be in the range of specifications or there might be errors in connections	3	The serial communication specifications should be followed	2	54
5	Circular buffer overflow	Since there is heap overflow, there is no memory location to store the new characters	7	When the dynamically allocated memory is not cleared and the heap becomes full, then there is overflow	2	The dynamically allocated memory should be cleared once the job is done	3	42
6	Communication Port Availability	While initial setup, if the communication port is not available, the communication link will not be setup	9	If the communication port driver is already occupied then the operating system will not allow access to the port	1	Ensuring the port we will use for serial communication should be available	2	18

