

Lassen iQ Serial Ports Required Pin Connections

1.) Table 1 shows the required connections for Rx pins of Lassen iQ when the pins are not used for communication:

Serial Port	Pin #	Assignment	Default	Required Connections
1st Serial Port	Pin 3	RxA	TSIP-IN	High (VCC) *
2nd Serial Port	Pin 6	RxB	RTCM-IN	High (VCC) *

Table 1

* Via pullup

2.) Table 2 shows the allowable connections for Tx pins of Lassen iQ, when the pins are not used for communication:

Serial Port	Pin #	Assignment	Default	Allowable Connections
1st Serial Port	Pin 1	TxA	TSIP-OUT	Floating or High (VCC) *
2nd Serial Port	Pin 5	TxB	NMEA-OUT	Floating or High (VCC) *

Table 2

* Via pullup

NOTE: Attaching the Tx lines (pins 1 and 5) to VCC and using pullup resistors is not required. Use of pullup resistors and attaching to VCC on Rx lines (pins 3 and 6) is mandatory if these pins are not otherwise connected to the system's communication ports.

3.) Table 3 shows the failure modes that will be experienced if the pins of the iQ serial ports are not connected as recommended above:

Pin #	High (VCC)	Low (GND)	Floating
Pin 1 TxA, SIO1	Works	Board will be damaged	Works
Pin 3 RxA, SIO1	Works	Will never produce a position fix.	Please do not choose this option. May work, cannot guarantee operation. Failure mode: will never produce a position fix.
Pin 5 TxB, SIO2	Works	Board will be damaged	Works
Pin 6 RxB, SIO2	Works	Please do not choose this option. May work, cannot guarantee operation. Failure modes: may never produce a position fix, may output potentially bad fixes intermittently.	Please do not choose this option. May work, cannot guarantee operation. Failure modes: may never produce a position fix, may output potentially bad fixes intermittently.

Table 3

NOTE: Table 3 indicates that the Tx pins 1 and 5 shall not be tied to Ground. As there are no internal pullups or current limiting resistors, tying TX to GND will directly pull down the VCC rail through the chip. This will pull excessive current, thereby stressing the chip beyond specification until it eventually fails.

4.) Pullup Resistor

The user needs to add a pullup resistor to his board in the range of 1K to 100K ohms for connecting the above-mentioned pins to VCC. One end of the pullup resistor is connected to the iQ pin and the other end is connected to the positive supply voltage VCC.

5.) What is the impact of the pullup resistor on the overall power consumption of the user's PCB?

The pullups do not affect the Lassen iQ power consumption since the resistors will be external to the board. The overall power consumption of the user's PCB will increase slightly. Assuming 3.3V VCC and 100k-pullup resistor, the power consumption increase will be 109uW or 33uA per pullup. With a 1k pullup resistor, the power consumption increase will be 10.9mW or 3.3mA per pullup.

To reduce the current draw, the users can choose higher value pullup resistors in the allowable resistor range of 1K-100K ohms. To minimize the overall power consumption of the user's board, 100K ohms pullup can be selected.

To keep BOM items to a minimum, the user can choose the highest value resistor used on their board.