SLAMTEC

SLAMWARE

Modular Autonomous Robot Localization and Navigation Solution

Datasheet

Contents

SLAMWARE modular autonomous robot localization and navigation solution is the core control module developed by SLAMTEC. It is available for autonomous localization and navigation based on RPLIDAR and supports for communicating the navigation information via serial port and Ethernet bus.

SLAMWARE modular autonomous robot localization and navigation solution implements the feature of map building, automatically path planning and motion controlling without extra calculating. Therefore, it can be easily integrated in the users' system according to their requirement.

Function & Feature

o **Super tiny**: with a size of 30x51mm^2 and exterior design of standard MINI PCIE

o **Independence**: Integration of autonomous mapping, localization, navigation

Operating Principle

The core module controls and reads the plan from RPLIDAR in real time via LBUS bus, and calculate the corresponding position coordinates, then output the navigation information via CBUS and HBUS.

Internal Module Structure & Usage

The internal structure of the core module is shown as the figure below. The module requires the direct current supply of 5v to function well and the required power supply of other parts in the module can be obtained through power network inside.
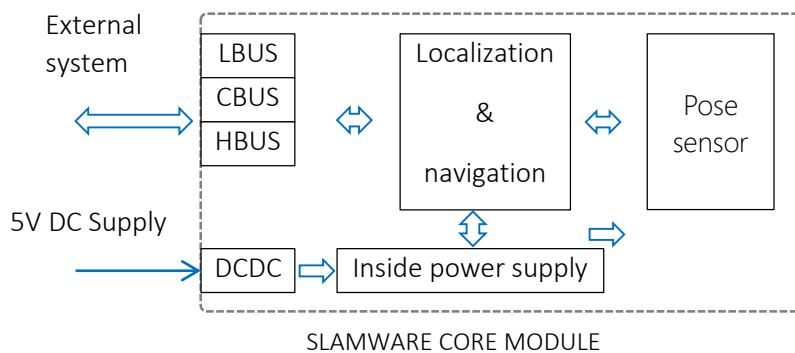

Figure 1-1 SLAMWARE Core Module Internal Structure

Main operational interfaces:

- o LBUS   RPLIDAR communication interface (Serial port)

- o CBUS   Low-speed control bus interface (Serial port)

- o HBUS   High-speed control bus interface(Ethernet)

Maximum Rating

Item	Range
Power supply voltage	-0.5V ~+6.0V
Pin voltage	-0.3V ~Vsc+0.3V
Operating temperature range	-20oC ~+65oC

Figure 2-1 SLAMWARE Core Module Internal Structure

Electrical Characteristics

TA = 20°C

Symbol	Parameter	Minimum Value	Typical Value	Maximum Value	Unit
V_{DD}	Rated system working voltage	4.75	5	5.25	V
I_{DD}	System current consumption	-	TBD	TBD	mA
V_{DD_IO}	Digital interface voltage range	2.9	3.3	3.8	V
I_{DD_IO}	Digital interface current consumption	-	-	TBD	mA
V_{DIL}	Low-level digital input	-	-	0.2*V_{DD_IO}	V
V_{DIH}	High-level digital input	0.8*V_{DD_IO}	-	-	V
V_{DOL}	Low-level digital output	-	-	0.2*V_{DD_IO}	V
V_{DOH}	High-level digital output	0.8*V_{DD_IO}	-	-	V
$I_{STANDBY}$	Current consumption @ off mode	-	-	TBD	mA

Figure 2-2 SLAMWARE Core Module Electrical Characteristics

Time Response

TA = 20°C

Symbol	Parameter	Minimum Value	Typical value	Maximum Value	Unit
$T_{STARTUP}$	Startup time	-	-	TBD	s
	Map resolution	-	TBD	-	mm2
f_{UART}	UART serial port Baud rate	-	115200	-	bps
f_{ETH}	Ethernet operating frequency	-	100	-	Mhz

Figure 2-3 SLAMWARE Core Module Time Response

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SLAMWARE CORE MODULE is connected via the standard MINI PCIE 52 pin.

Pin Definition

No.	Name	Description
1	NC	Floating pin. Please set the pin not connected and not receiving any signal.
3	GND	System ground wires
5	NC	Floating pin. Please set the pin not connected and not receiving any signal.
7	NC	Floating pin. Please set the pin not connected and not receiving any signal.
9	GND	System ground wires
11	NC	Floating pin. Please set the pin not connected and not receiving any signal.
13	NC	Floating pin. Please set the pin not connected and not receiving any signal.
15	GND	System ground wires
17	NC	Floating pin. Please set the pin not connected and not receiving any signal.
19	NC	Floating pin. Please set the pin not connected and not receiving any signal.
21	GND	System ground wires
23	ETH_RX-	HBUS Ethernet RXI-
25	ETH_RX+	HBUS Ethernet RXI+
27	ETH_RREF	HBUS Ethernet receiving termination voltage
29	GND	System ground wires
31	ETH_TX-	HBUS Ethernet RXI-
33	ETH_TX+	HBUS Ethernet RXI+
35	ETH_TREF	HBUS Ethernet receiving termination voltage
37	GND	System ground wires
39	NC	Floating pin. Please set the pin not connected and not receiving any signal.
41	NC	Floating pin. Please set the pin not connected and not receiving any signal.
43	GND	System ground wires
45	LPWM	LBUS RPLIDAR motor PWM speed control signal. Motor speed of HRPWM when duty ratio is proportional to output torque.
47	LTX	LBUS RPLIDAR data sending port. RPLIDAR RX connection required.
49	LRX	LBUS RPLIDAR data receiving port. RPLIDAR TX connection required.
51	nL5VEN	Power supply control pin for LBUS RPLIDAR core.

2	5V	System power supply +5V.
4	GND	System ground wires
6	NC	Floating pin. Please set the pin not connected and not receiving any signal.
8	CBUSY	CBUS busy signal. OD output. High effective.
10	CRX	CBUS data receiving port
12	CTX	CBUS data sending port
14	GND	System ground wires
16	nCCMD	CBUS data interrupt signal. Negedge effective. OD control required.
18	GND	System ground wires
20	NC	Floating pin. Please set the pin not connected and not receiving any signal.
22	NC	Floating pin. Please set the pin not connected and not receiving any signal.
24	MLED	System normal operating signal, low effective.
26	GND	System ground wires
28	5V	System power supply +5V
30	NC	Floating pin. Please set the pin not connected and not receiving any signal.
32	NC	Floating pin. Please set the pin not connected and not receiving any signal.
34	GND	System ground wires
36	NC	Floating pin. Please set the pin not connected and not receiving any signal.
38	NC	Floating pin. Please set the pin not connected and not receiving any signal.
40	GND	System ground wires
42	NC	Floating pin. Please set the pin not connected and not receiving any signal.
44	NC	Floating pin. Please set the pin not connected and not receiving any signal.
46	NC	Floating pin. Please set the pin not connected and not receiving any signal.
48	5V	System power supply +5V
50	GND	System ground wires
52	5V	System power supply +5V

Figure 3-1 SLAMWARE Core Module Pin Definition

Time Sequence

All the communication interfaces of SLAMWARE core module such as LBUS, CBUS, HBUS, etc. meet the requirement of international standard UART and ETH

Typical Circuit
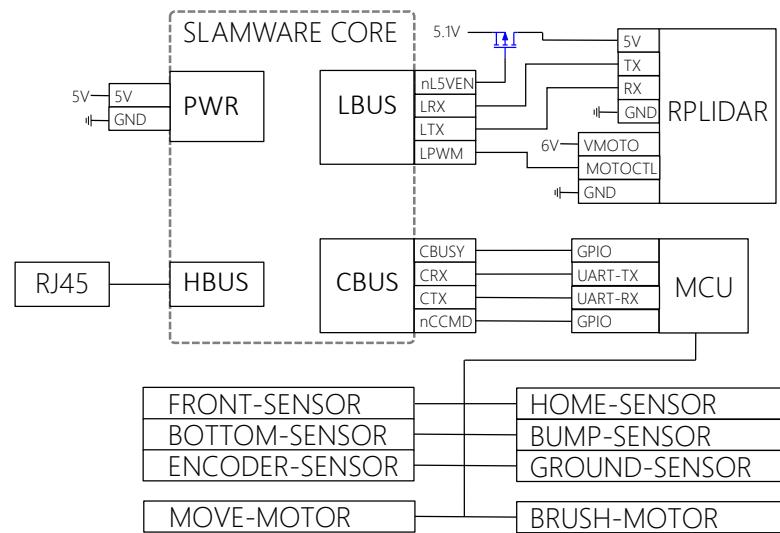
Figure 3-2 SLAMWARE Core Module Typical Circuit

SLAMWARE core module mechanical configuration meets the standard of MINI PCIE's mechanical dimensions.

SLAMWARE CORE MODULE is 4 mm thick both in the top and bottom, please make sure enough space to be set aside and heat output channel to be designed properly.

The recommended MINI PCIE card connector for SLAMWARE CORE MODULE is MOLEX Edge Card Connector, PN:67910-9000, (0.80mm Pitch, 9.00mm Height, PCI Express* Mini Card, 52 Circuit, Right Angle, Surface Mount, 0.25μm Gold (Au) Plating, Tape on Reel, Lead-Free).
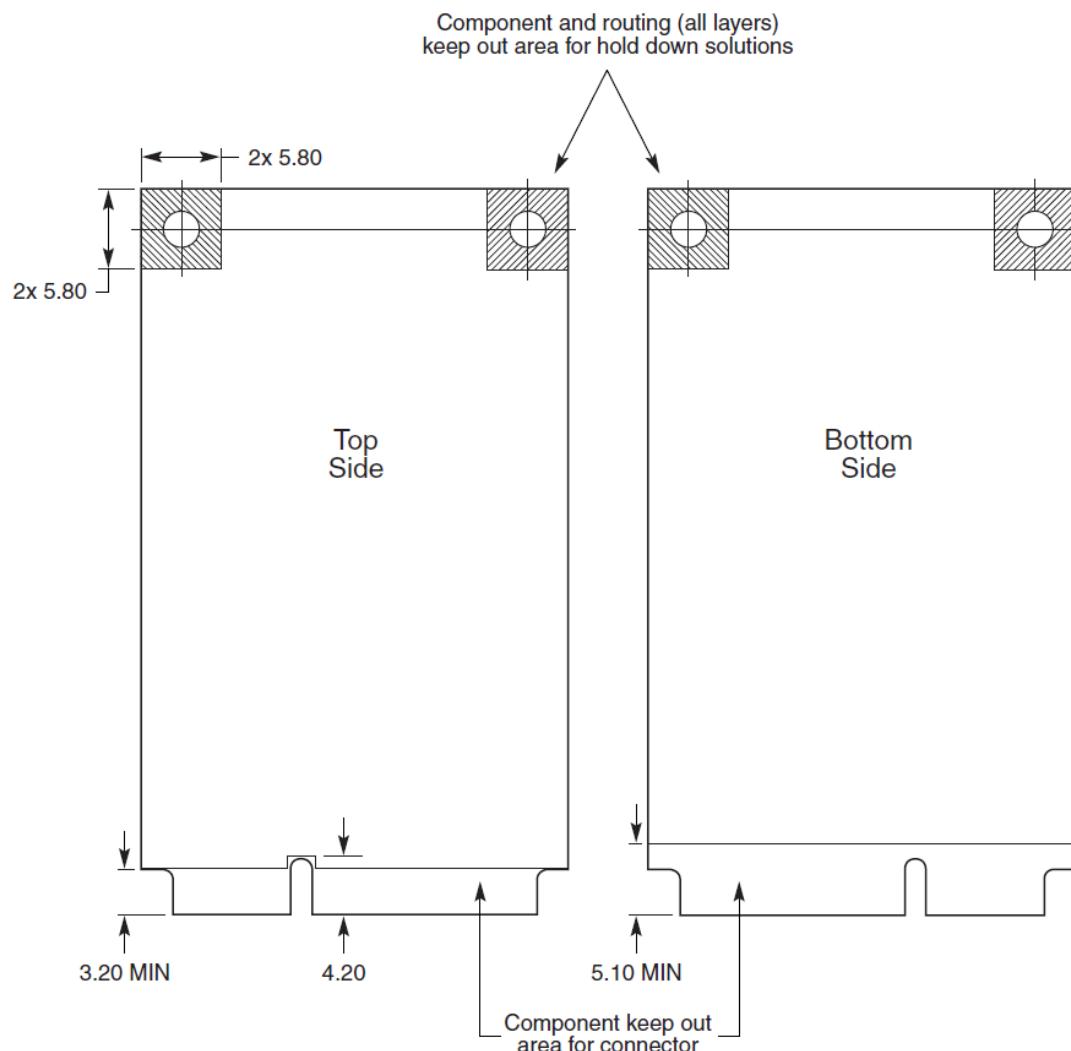

Figure 4-1 SLAMWARE Core Module's External Design
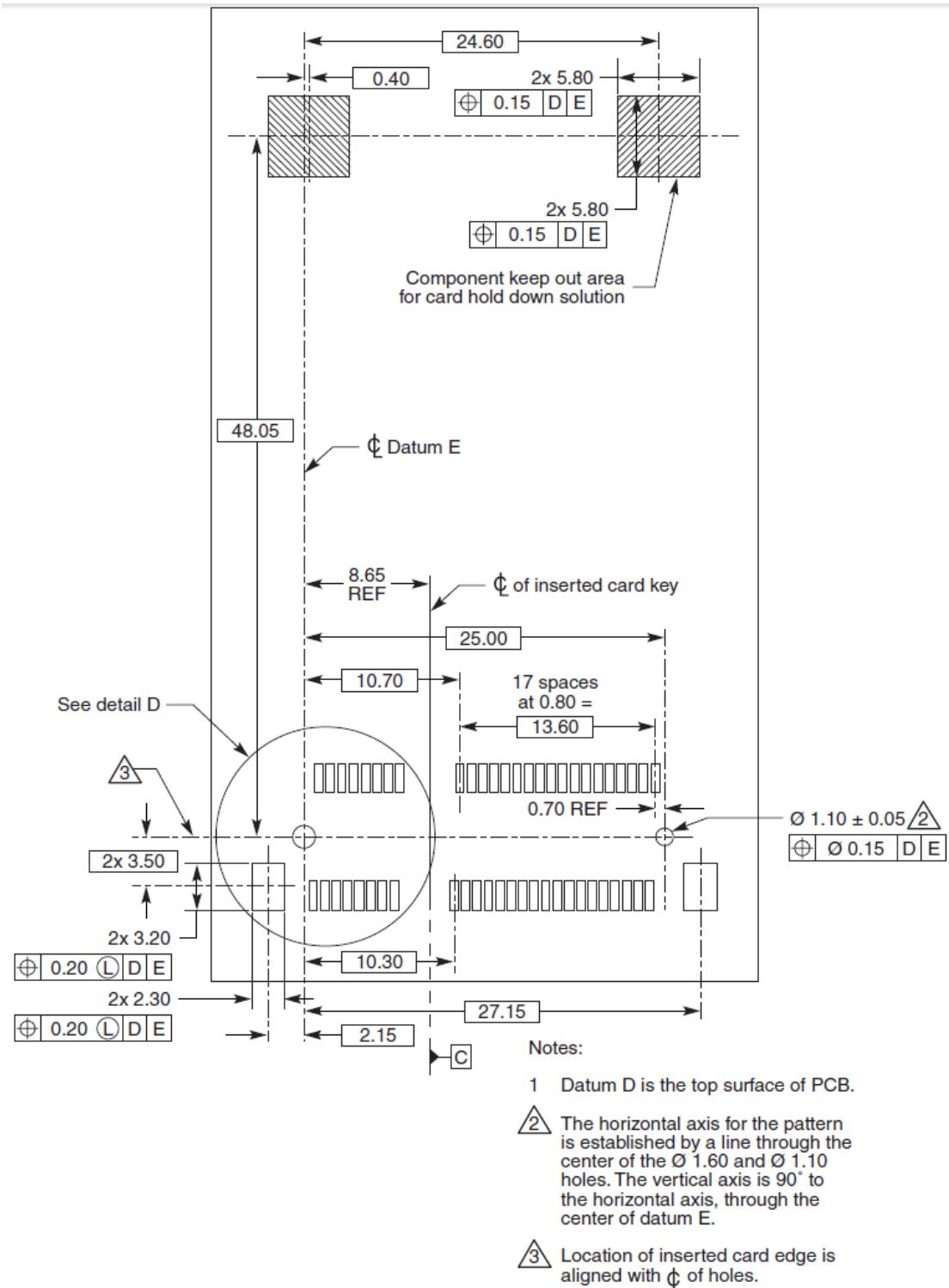
Figure 4-2 SLAMWARE Core Module's Design Parameter

5. Contact Us

The product is designed and produced by SLAMTEC and our homepage is:

http://www.slamtec.com

If you have any questions or suggestions, please contact us via the following support email:

support@slamtec.com

6.   Revision History

Date	Version	Description
2015-1-5	0.1	Initial version
2015-9-9	0.2	Add typical figure frame diagram
2015-10-9	0.3	Delete obsolete chapters and update contents
2015-10-15	0.4	Add recommended card connector model for MINI PCIE
2015-12-30	0.5	Polish up the text and remove the logo of RoboPeak
2015-01-25	0.6	Add 5v power supply control pin for RPLIDAR core
2016-05-09	1.8	Updated the layout

Image and Table Index