DRUM WORKSHOP INC

Module Integration Instructions for Module DWE-DLM-1

FCC ID: 2A9KBDLM191695 & IC ID:29868-191695

Regulatory Compliance

This section summarizes the responsibilities and actions required of the manufacturer (Drum Workshop) to incorporate the DWE-DLM-1 module device into their products. In certain situations, and applications, these "Host" products will require additional FCC, ISED or other regulatory approvals prior to sale or operation.

Appropriate instructions, documentation and labels are required for all products. For more information concerning regulatory requirements, please contact Drum Workshop and or a regulatory test lab.

FCC Certification and Important Information for the Integration of Module

This module has been granted ***limited modular approval***. Drum Workshop is the only authorized manufacture that can use this module for integration in to the following final DWe products, DWE-DT1, DWE-CT1 & DWE-DH1, if they meet the following conditions;

- The host product with the module installed must be evaluated for simultaneous transmission requirements.
- The user's manual for the host product must clearly indicate the operation requirements and conditions that must be observed to ensure compliance with current FCC/ISED RF exposure guidelines.
- A label must be affixed to the outside of the host product that includes the following statement
    - "Contains FCC ID: 2A9KBDLM191695"
    - "Contains IC ID: 29868-191695"
    - Along with the appropriate host name

The DWE-DLM1 module has been tested under FCC Part 15 Subpart C 15.247 for Intentional Radiator, FCC CFR 47 Part 15 Subpart B for Unintentional Radiators, FCC CFR 47 Part 1.1310 for MPE/RF Exposure and KDB 558074 D01 v05r02 for compliance on DTS, FHSS, HSD operating under section 15.247. All testing has confirmed compliance with the above stated regulations.

Drum Workshop has not approved any changes or modifications to this device by the end user. Any changes or modifications could void the user's authority to operate the device/host.

FCC Module Labeling

If the FCC ID of the module is not visible when installed in the host platform, then a permanently attached or marked label must be displayed on the host unit it's self-referring to the module as;

- "Contains FCC ID: 2A9KBDLM191695"

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Also listed in the end user manual the following statement should be placed.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

End Product Labeling for FCC:

When the module is installed in the host device, the FCC/IC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: 2A9KBDLM191695"

FCC Part 15 Statement (Only Include if FCC Part 15 is Required on the End Product):

Note: This equipment has been tested and found to comply with the limits for a *(OEM to insert device type: Class A or Class B)* digital device, pursuant to Part 15 of the FCC Rules. *(OEM must follow Part 15 guidelines (§15.105 and §15.19) to determine additional statements required in this section for their device class)*

Radiation Exposure Statement for FCC:

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

ISED Statement and Labeling:

This device complies with ISED's license-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d' ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

A label containing the ISED Certification number must be permanently affixed to the exterior of the host device into which the DWE-DLM1 module device is installed. The label may also be under a panel or battery pack if it is readily accessible and cannot be separated from the host device itself. The label must contain a statement similar to the following; "Contains IC: 29868-191695" and show appropriate host name.

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Important Safety Information

The following information applies to the devices described in this manual. Always observe all standard and accepted safety precautions and guidelines when handling any electrical device.

- Save this manual: it contains important safety information.
- Do not expose the DWE-DLM1product to open flames.
- Ensure that liquids do not spill on to the devices.
- Do not attempt to disassemble the product: Doing so will void the warranty. This product does not contain consumer-serviceable components.

Product Overview

The DWE-DLM1 transceiver module can be installed into three DWe host devices, the DWE-DT1, DWE-CT1 and the DWE-DH1. In its basic form it is the wireless conduit for midi and telemetry data. The DWE-DLM1 transceiver is used to digitize analog voltage inputs from multiple analog sensors and then convert these signals into digital information packets via an MCU. The data is then transmitted on a carrier frequency as needed in the 2400-2483.5 MHz ISM band using GFSK modulation at ~1Mbps data rate at10mW RF output power. After the sensor information has been transmitted the DWE-DLM1 it is then put into a receive mode and searches for an acknowledgment signal from its “paired” device.

The DWE-DLM1 transceiver module can also be installed into devices used to receive these digitized sensor signals and send back an acknowledgement signal, such as the DWE-DH1. Using all the same data rates, modulation, RF power level and frequency band as described above. In this mode the DWE-DLM1 collects the incoming data and sends it out via USB or other communications to an interpretation device, such as a PC or other intelligent devices, that can interpret the info.

The communication scheme is as such that the sensor collection data is transmitted on one frequency and the acknowledgments are sent on a second frequency. An example of this is the current usage of 4 channels, thus allowing 4 simultaneous operations of systems, see the frequencies used currently below.

1) ch1 2402MHz 2423MHz
2) ch2 2426MHz 2448MHz
3) ch3 2451MHz 2472MHz
4) ch4 2476MHz 2480MHz

Installation

This modular transmitter is only approved for use by the grantee in its own products and is not intended for sale to third parties. These instructions are intended for internal use only by an authorized representative of Drum Workshop.

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DWE-DLM1 Module

The DWE-DLM1 module RF section is covered by a sealed RF shield as shown below and making it un-accessible to an end user.

1. **RF Shield:**
   - **a.** The fence (bottom) of the shield has been soldered to the PCB.
   - **b.** The lid (top) of the shield shall be press-fit onto the fence and soldered to the fence (bottom) to complete the assembly of the DWE-DLM1 module making it un-accessible.

The DWE-DLM1 module has two different types of antennas. There is one chip antenna that is a 2.4GHz antenna and one wire antenna. Both antennas are not to be modified in any way and must remain in the fixed location as installed by the manufactures. The diagrams below calls out the placement of the antenna as they have been manufactured and must remain this way when inserted into a host.

The chip antenna of the DWE-DLM1 module is part of the PCBA assembly as shown in the below photo.

Then the wire antenna is installed on to the DWE-DML1 module as shown below.

Once the module is complete it is then installed by soldering on to the main PCBA of 1of 3 host boards. The DWE-DT1 (Host), the DWE-CT1 (Host) and or the DWE-DH1 (Host) as shown in the below photo

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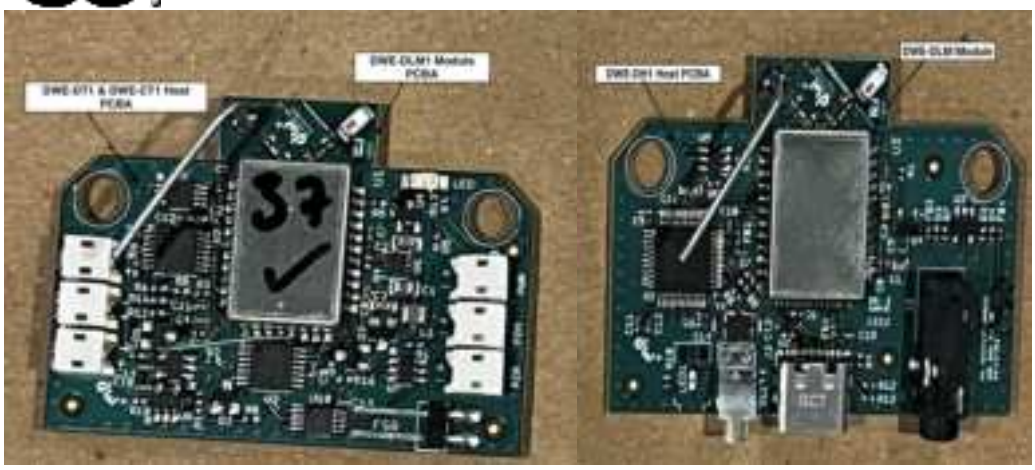

The module/host PCBAS are now ready to install into their respective host mechanicals to complete final host assembly.

Electrical specifications, Pin Assignment & Description:

Parameter	Symbol	Minimum	Typical	Maximum	Units
Supply Voltage	Vcc	3.2	3.3	3.39	Vdc
Supply Current	Icc	0.01	20	250	mA
I/O Voltage Lo	Vlo			.35 x Vcc	Vdc
I/O Voltage Hi	Vhi	.7 x Vcc			Vdc
RF Output Power	Pout			10	dBm

Pin #	**Pin Name**	**I/O**	**Description**
1	GND	Supply	Ground for power and signal lines
2	GND	Supply	Ground for power and signal lines
3	PTC1	I/O	Digital input output pin
4	PTC2	I/O	Digital input output pin
5	PTC3	I/O	Digital input output pin
6	PTC4	I/O	Digital input output pin
7	PTC5	I/O	Digital input output pin
8	PTC6	I/O	Digital input output pin
9	PTC7	I/O	Digital input output pin
10	PTC16	I/O	Digital input output pin
11	PTC17	I/O	Digital input output pin
12	PTC18	I/O	Digital input output pin
13	GND	Supply	Ground for power and signal lines
14	PTA0	I/O	Digital input output pin
15	PTA1	I/O	Digital input output pin
16	PTA2	I/O	Digital input output pin
17	PTA16	I/O	Digital input output pin
18	PTA17	I/O	Digital input output pin
19	PTA18	I/O	Digital input output pin
20	PTA19	I/O	Digital input output pin

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21	GND	Supply	Ground for power and signal lines
22	GND	Supply	Ground for power and signal lines
23	Vcc	Supply	Power for Module (3.3Vdc +/- 3%)
24	PTB0	I/O	Digital input output pin
25	PTB0	I/O	Digital input output pin
26	PTB0	I/O	Digital input output pin
27	PTB0	I/O	Digital input output pin
28	PTB0	I/O	Digital input output pin
29	PTB0	I/O	Digital input output pin
30	PTB0	I/O	Digital input output pin
31	ADC0_DP0	I	Analog to digital converter pin
32	ADC0_DM0	I	Analog to digital converter pin
33-36	GND	Supply	Ground for power and signal lines

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