FAVITE

User's Manual v1.0.0.0

F740

A/2013

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Federal Communication Commission Interference Statement

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.
This equipment has been tested and found to comply with the limits for a Class A
digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to
provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses and can radiate radiofrequency energy and, if not
installed and used in accordance with the instructions, may cause harmful interference
to radio communications. However, there is no guarantee that interference will not
occur in a particular installation. If this equipment does cause harmful interference to
radio or television reception, which can be determined by turning the equipment off
and on, the user is encouraged to try to correct the interference by one of the
following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that
  to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party
responsible for compliance could void the user's authority to operate this
equipment.This transmitter must not be co-located or operating in conjunction with
anyother antenna or transmitter.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an
uncontrolled environment. This equipment should be installed and operated
with minimum distance 22cm between the radiator & your body.

Professional installation instruction

1. Installation personal
   This product is designed for specific application and needs to be installed by a
   qualified personal who has RF and related rule knowledge. The general user shall
   not attempt to install or change thesetting.
2. Installation location

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The product shall be installed at a location where the radiating antenna can be kept 22cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.

3. External antenna

Use only the antennas which have been approved by the applicant. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC limit and is prohibited.

4. Installation procedure

Please refer to user's manual for the detail.

5. Warning

Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in relevant rules.

The violation of the rule could lead to serious federal penalty.

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1. Introduction

This user's manual guide is providing instruction for installing and operating the F740 RFID reader.

This document is designed for use by RFID system integrators and software developer who develops relatively program and extended systems that take full advantage of the RFID Reader's capabilities.

1.1 Overview

F740, one of FAVITE RFID reader family, is an Intel ATOM CPU based smart reader. The F740 is embedded with Impinj R2000 chip and following EPC Class1 Gen2 Dense Reader mode (DRM) / ISO 18000-6C. The F740 is equipped with 4 TNC RF antenna ports which could support 4 mono-static antennas that could support to the richest enterprise applications. With the powerful combination of TI ARM9 and 1GB memory, the F740 is the smartest RFID reader available and capable of running complex RFID applications.

The RFID Reader is delivered with the following components and accessories:

- One (1) RFID Reader.
- One (1) power supply and cord.
- Operation system:
  A. Linux embedded operation system with SCO server.

1.2 Requirement

The list following is the requirements of environment of the FS-GF801:

- Standard DC 19V +/ - 0.5V

- 2.6A Power supply

- Favite demo software/ the software developed based on Favite Software Development Kit

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1.3 Reference Documents

Table 1: Reference Documents

| Reference Document	Version
EPC Class-1 Gen-2 UHF RFID Protocol for communications at 850-960MHz	
FAVITE FS-GF801 GPIO Programming Guide DotNet CSharp (optional)	2.0.0.0
FAVITE SDK Getting Started Guide CSharp WinCE (optional)	2.0.1.0
FAVITE Saturn 7 AP User Guide (optional)	2.2.0.0
FAVITE FS-GF801Recover Guide (optional)	1.0.0.1
FAVITE SCO Protocol User Guide	1.1.1.0
FAVITE Scorpio Tool User Guide	1.1.1.0
FAVITE SCO Recovery User Guide	1.1.1.0

1.4 Specifications

Table 2: Specification of the F740System		
Chipset	PHY: Impinj R2000 MAC: ATMEL AT91SAM7S-256	
Protocol		
RFID Protocol Support	EPC Gen 2 , ISO 18000-6C	
Support EPC DRM	Yes (with DRM Filter) Switchable	
RF		
Frequency	US: 902 ~ 928MHz（FHSS） EU: 865 ~ 868MHz	SRRC: 920~925MHz JP:952~954MHz NCC: 922-928MHz
Demodulation	ASK or PSK	
Modulation Depth	90% nominal	
Data Encoding	FM0 or Miller code	
Bit Rate	Supports uplink data rates of up to 640 Kbps (DRM)	
TX Output power	5 ~ 32dBm in 0.1dB step	
Antenna Type	4Port Mono-static	
Antenna connector	4 Reverse Polarity TNC connectors	
Regulatory and Environmental Compliance		
EMC certification	FCC 47 CFG Ch.1 Part 15 (US) ETSI EN 302 208-1 (V1.1.1) (EU) NCC CAAI10LP0970(TW) SRRC SRTC2010-A070-0016 (China) DSP RJ9905 10C02 (JP)	
Safety Certification	CE/FCC Class A, UL, CCC	
Environment		
Temperature Range	Operating: 0 ~ 55 degree C @ 80%RH Storage: -20 ~ 85 degree C @ 90%RH	
Humidity	10% ~ 85% Non-condensing	
System Architecture		
Processor	TI ARM9	
System Memory	1GB DDR2 SDRAM	
Internal Storage	1GB Flash	

Software	
Operation System	Linux with SCO server
General Characteristics	
Dimension	500mm x 245 mm x 50.49mm
Weight	2.5 Kg
Base Material	Die-cast aluminum
Mounting	Wall mounting, vertical placement
Power Input	DC 19V +- 0.5V / 1.5A @ 33dBm
Power Consumption	28.5 W (Typical)
Communication	
USB	USB2.0
Ethernet	10/100 Base-T (RJ-45)
GPIO	4 digital input, 4 digital output

Mechanical: Reader Physical Size

Figure 1: F740 Reader Physical Size

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50,49

212,00

245,00

13,20

33,11

29,72

30,67
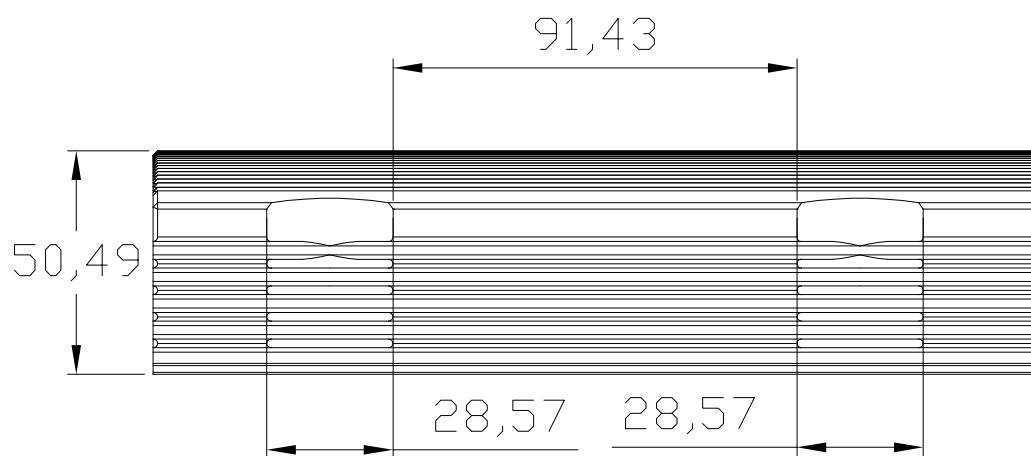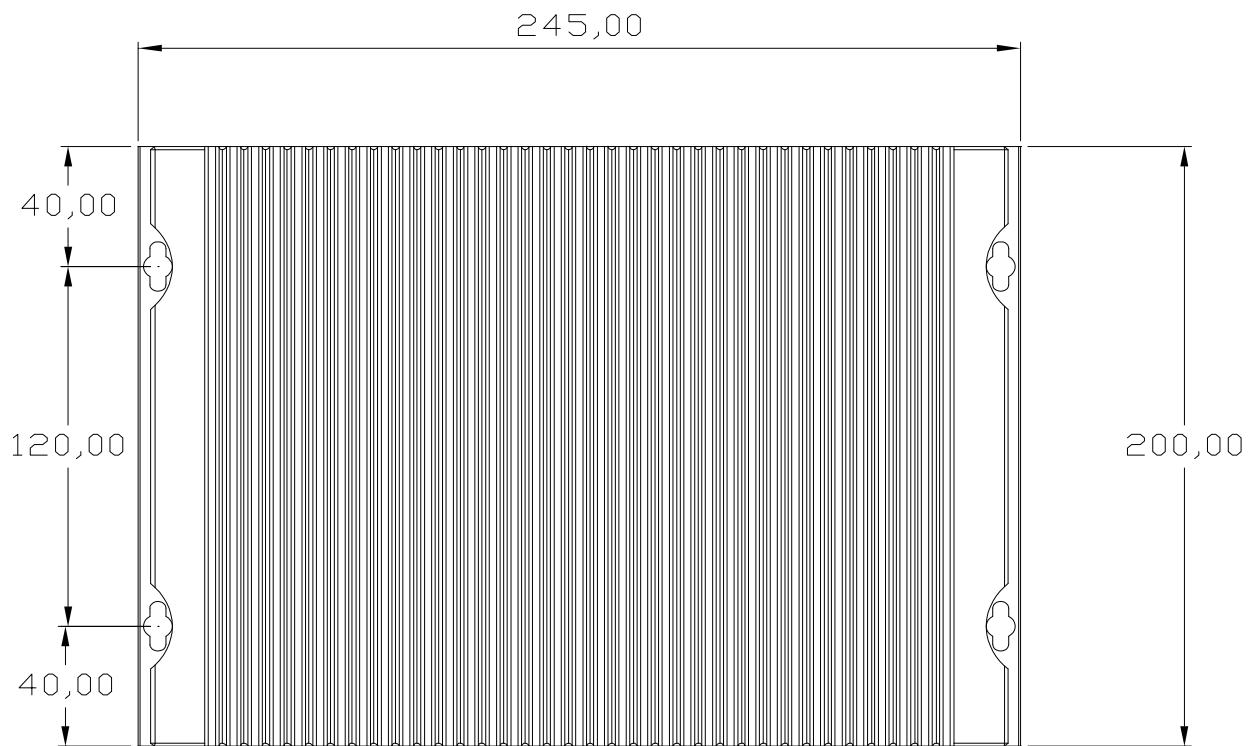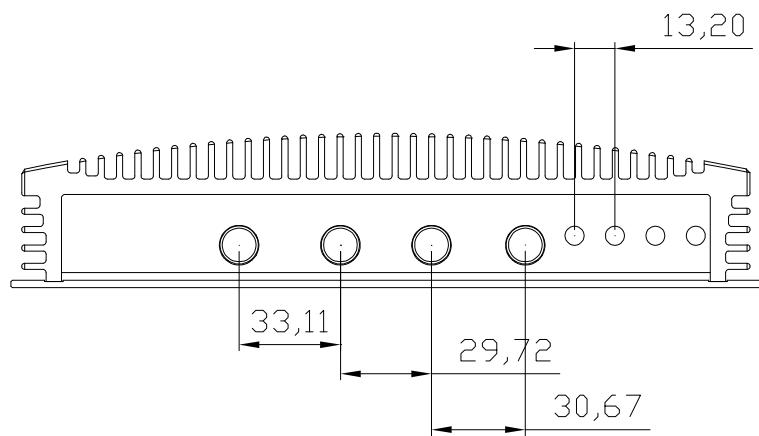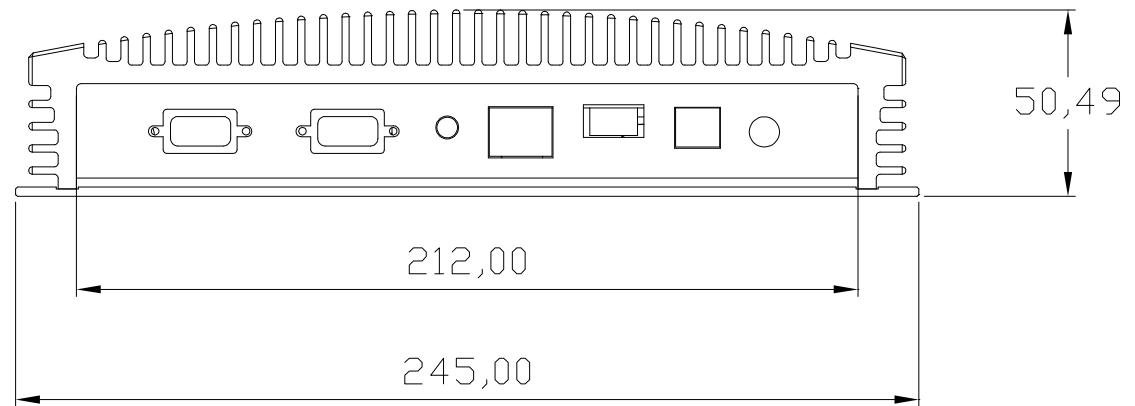
Figure 2: F740 Reader I/O Terminal

| GPIO | RS232 | reset | RJ45 | USB2.0 | FTDI com port | power |
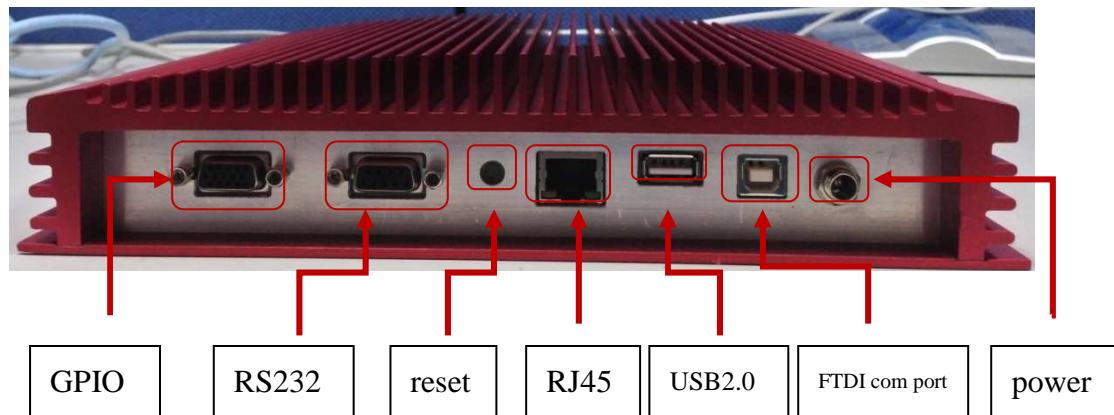
Figure 3: Antenna Port Terminal Interface

| Antenna1 | Antenna2 | Antenna3 | Antenna4 | power | link | error | debug |
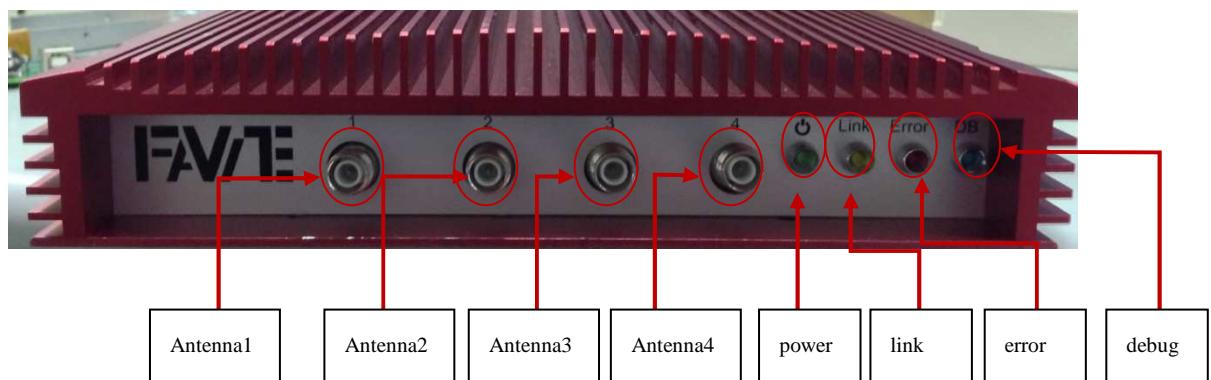
**Figure 4: F740 GPIO Pin definition and I/O description.**

Pin definition

D-SUB 15pin
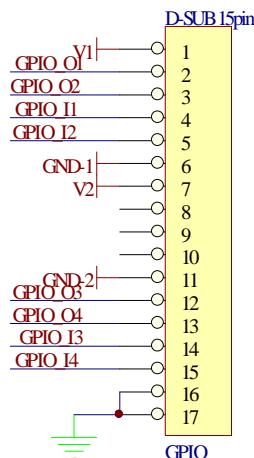
GPIO

GPIO-OUT Circuit diagram (add figure#)
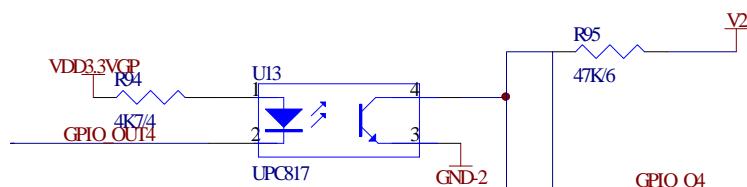
GPIO-IN Circuit diagram(add figure#)
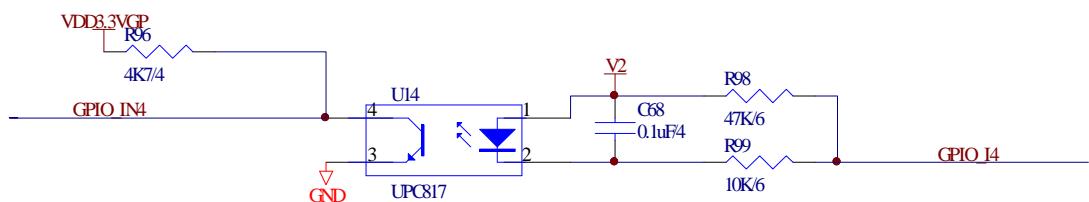
Note:

Please add the 4k7 electric resistances. The limitation of voltage is from 12V to 24V. The limitation of Watt is above 5W.

If FS-GF801 is going to transmit signal to other device, please connect to the device which is below 48V and 10mA.

If user wants F740 to receive data from other device through GPIO, please connect 24V power source to PIN19 or PIN20 and connect the device output line to Pin 1~ Pin8.

The development of programming of receiving data from GPIO could reference the document "FAVITE F740 GPIO Programming Guide_DotNet CSharp" for read data from GPIO with application method.

If user wants F740 to transmit data to other device though GPIO, please connect to Pin 9~ Pin 16.

The programming of transmitting data to other device (like light stack) could reference the document "FAVITE F740 GPIO Programming Guide_DotNet CSharp" for write data from GPIO with application method. The device should connect to independent power source.

2. Reader Hardware Installation and Operation

2.1 Receiving the RFID Reader

Your RFID Reader Kit is shipped with the items listed below. Please verify the contents of your received shipment before assembling.

- RFID reader.

- Power supply and cables (two sections: one attached, one detached).

- CD-ROM containing demonstration software, user guides and documentation.

Figure 5: F740 (1)

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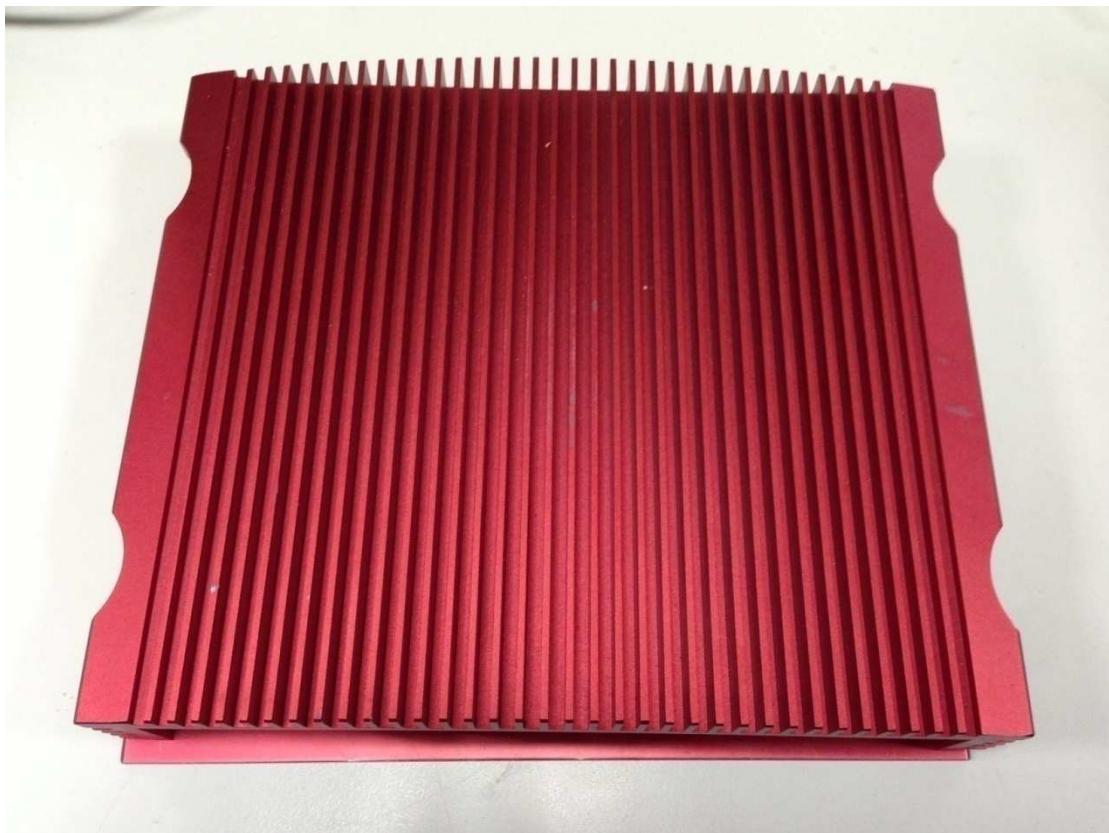
Figure 6: F740 (2)

Figure 7: FS-GF740 Power Supply and Adapter cable

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2.2 Diagnostic LEDs

The F740 is including diagnostic LEDs on the face of the reader to provide easy and convenient external indication for various operating conditions:

- POWER (green) – indicates that power is applied to the reader.
- Read (yellow) – indicates that the reader is receiving data from a tag.
- Fault (red) – indicates that a fault condition like CRC check error.
- debug (blue) – indicates that the F740 is into debug mode

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Figure 8: FS-GF801 Reader Diagnostic LEDs

Antenna Panel

The antenna panel is containing four coax antenna connector ports, which isTNCconnector, as shown below. These are TNC connectors.

CAUTION: Reader antennas should be positioned so that personnel in the area for prolonged periods may safely remain at least 23 cm (9 in) in an uncontrolled environment from the antenna's surface. See FCC OET Bulletin 56 "Hazards of radio frequency and electromagnetic fields" and Bulletin 65 "Human exposure to radio frequency electromagnetic fields."

2.3 Demonstration Software Guide

Please refer to the document "FAVITE API Programming Guide_DotNet CSharp", "FAVITE SDK Getting Started Guide CSharp", "FAVITE Saturn Demo API User Guide" and "F740 GPIO Programming Guide_DotNet CSharp".

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