

# **RF Module Manual for PCB 100/482.**

| Document Author & Review |                     |           |                                   |
|--------------------------|---------------------|-----------|-----------------------------------|
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| Approval |          |           |      |
|----------|----------|-----------|------|
| Name     | Position | Signature | Date |
|          |          |           |      |

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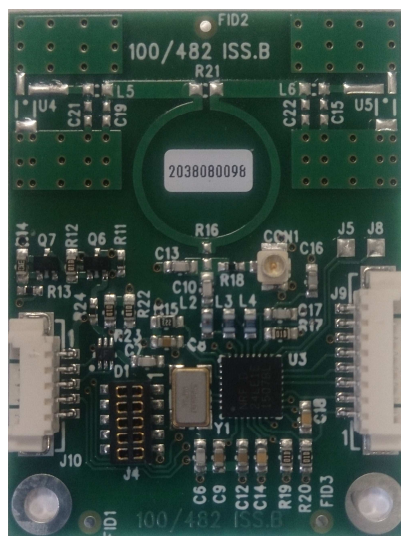
## Revision History

| Revision | Date       | Approval | Revision Summary |
|----------|------------|----------|------------------|
| A        | 15/11/2017 |          | Draft            |
|          |            |          |                  |

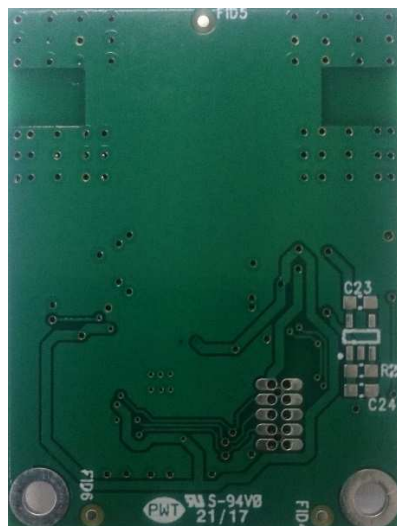
### RF Module Manual for PCB 100/482.

- Crane Part No 101482a
- PCB Number 100/482. ISS.B.

Front:

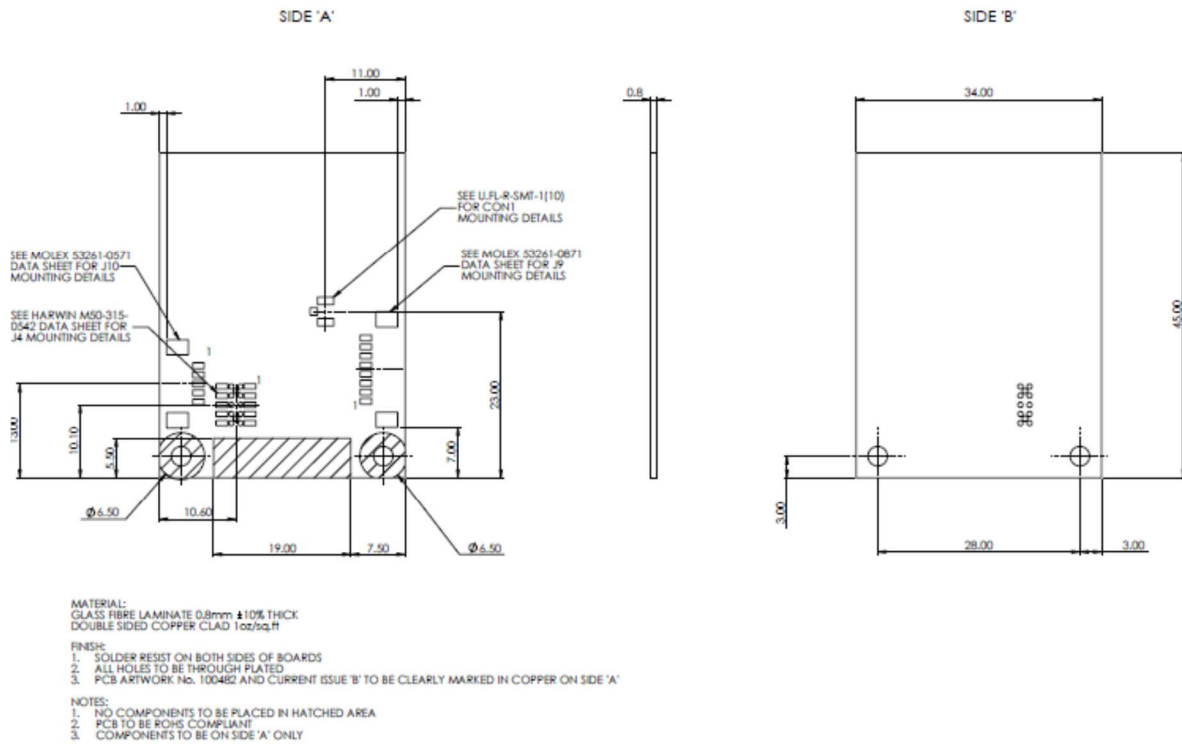


Rear:



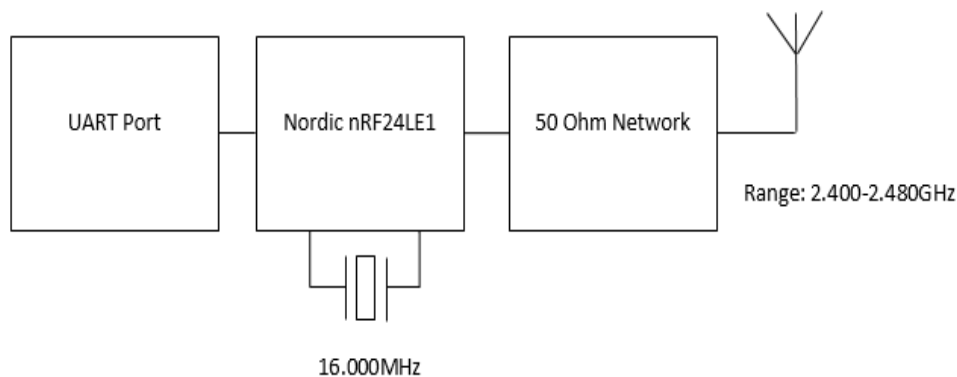
**Introduction** - The RF module has been developed to integrate into Crane Electronics (CEL) product. The RF module allows digital information (of a torque nature) to be transmitted between CEL product. It is a transceiver that can operate as a transmitter or a receiver. Readings are transmitted as they are taken. The PCB is in standby when not transmitting. It has a small form factor to make it easy to integrate.

**! Warning** – It is not designed for life support or safety critical applications.

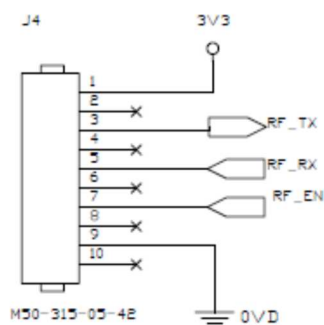


### Key Features:

- Maximum power 0dBm (Can be reduced in 6dB steps)
- Frequency Range 2400.0 – 2480MHz (can select channels 2 to 79)
- Narrow 1MHz bandwidth
- GFSK modulation
- 250kbaud air communication rate
- Operates on 3.3V (+/-10%)
- UART port for communicating with Crane product at 500kbaud.
- Temperature range -20C to +55C
- Typical transmitter duty cycle less 1%
- Pairs with another RF Module giving point to point communication.
- 8051 processor with bootloader.
- Typical current consumption: 18mA.
- Block Diagram:



### UART Port pin Details:

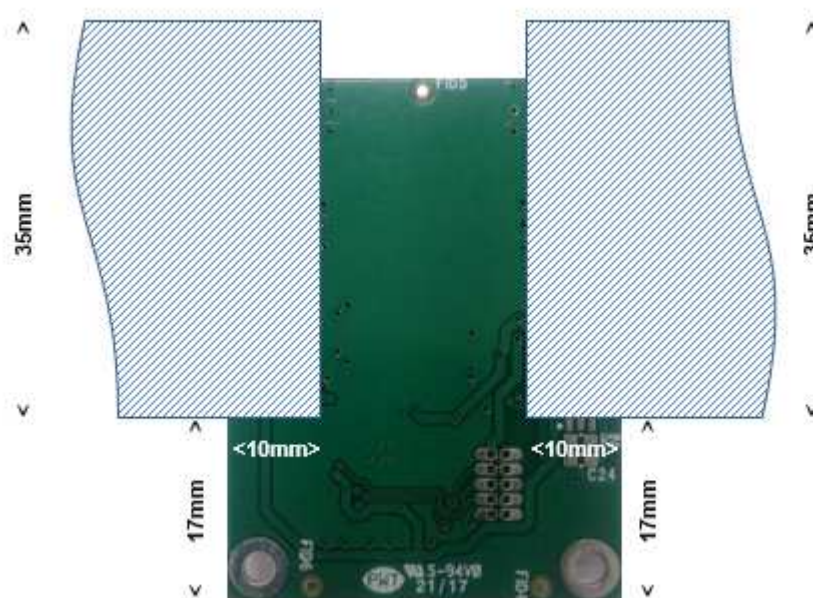


#### Antenna Details:

- Internal antenna (The unit cannot be mounted in a metal-shielded enclosure with this antenna. This restriction also includes the use of plastic with metal flakes and metallic based paint or lacquer.) If a metal enclosure then an external antenna should be used.

#### Internal Antenna restriction:

- The internal antenna must not be restricted by Metal in the hashed area shown in the following diagram:



- External antenna type and connection: (UFL)WizNet W5E-WO-03L. Gain: 3dB. (use only approved antenna)
  - Antenna types not included in this list, having a gain greater than the maximum gain indicated above, are strictly forbidden.
  - The antenna is included in the FCC and R&TTE test reports, and thus approved for use in countries that accept those approvals.

## **Declaration of conformity**

### **CE mark**

Crane Electronics Ltd, Watling Drive, Sketchley Meadows, Hinckley. LE10 3EY - declares that 101482a complies with the following specifications:

ETSI EN 301 489-1:V2.1.1 (2017-02) and draft ETSI EN 301 489-3:V2.1.0 (2016-09)

ETSI EN 300 440: Final Draft V2.1.1 (2017-01)

FCC 47 CFR Part 15B: 2016

FCC 47 CFR Part 15C: 2016

IEC60950-1:2005+AMD1:2009+AMD2:2013

Environmental:

BS EN50419:2006 marking of electrical and electronic equipment in accordance with WEEE directive.

BS EN 62474:2012 Material declaration for products of and for the use of the electro technical industry.

### **FCC 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 B 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 radio frequency 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 or more 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.

### **End product labelling requirements**

For an end product using the product 101482a there MUST be a label containing, at least, the following information:

This device contains  
FCC ID: TA6RFM01

The label must be affixed on an exterior surface of the end product such that it will be visible upon inspection in compliance with the modular approval guidelines developed by the FCC.

### **FCC end product labelling**

In accordance with 47 CFR § 15.19 the end product shall bear the following statement in a conspicuous location on the device:

"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."

When the device is so small or for such use that it is not practicable to place the statement above on it, the information shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed.

However, the FCC ID label must be displayed on the device. In case, where the final product will be installed in locations where the end-consumer is not able to see the FCC ID and/or this statement, the FCC ID and the statement shall also be included in the end-product manual.

### **RF-exposure statement**

The RF module is within the European and FCC RF Exposure limits at 20cm for Occupational use and General public.

### **Antenna**

The module 10184a is for OEM integrations only into Crane Electronics product. In the end-user product the module shall be professionally installed in such a manner that only the authorized antennas can be used.

Any changes or modifications NOT explicitly APPROVED by Crane Electronics could cause the module to cease to comply with FCC rules part 15, and thus void the user's authority to Operate the equipment.

Operating frequency limited to channels 2 to 79.



## Product Disposal



### **Applicable in the EU and other European Countries with separate collection systems**

The symbol shown above and on the product means that the product is classed as Electrical or Electronics Equipment and should not be disposed with normal commercial waste at the end of its working life.

The Waste of Electrical and Electronics Equipment (WEEE) Directive (2012/19/EU) has been put in place to Recycle products using best available recovery and recycling techniques to minimise the impact on the Environment, treat any hazardous substances and avoid the increasing landfill.

For more detailed information about recycling of this product please contact your local authority or the Company where you have purchased the product.

### **In Countries outside the EU:**

If you wish to discard this product, please contact your local authorities and ask for the correct way of disposal