

**DRAFT**

*Hi-G-Tek*

# *RFID Compact Reader*

## *Installation Guide*



**DRAFT**

## 1. Introduction

The Compact Reader is a component of Hi-G-Tek's wireless monitoring system use for outdoor installations. It allows coverage and protection of secured cargoes or assets in large storage yards and ports.

The Compact Reader utilizes RFID technology to communicate with the RFID sensors (data tags /seals) over the UHF channel (433 MHz. or 916MHz). It interrogates their ID, status and user data. Correspondingly, each tag/seal reports its unique identification and anti-tamper alarm status in a short beacon transmission over the high-frequency channel.

Each reader is able to communicate with a numerous sensors simultaneously, verifying their presence and status, any changes in status are immediately reported. Using an isolated RS-485 interface, multiple readers can be easily networked together into a single controlling computer. This allows enlarging even further the coverage area of the readers while keeping them synchronized within the field of application.

The Compact Reader powered from an indoor power supply & comm. unit (PSC unit) that provides both protected power and isolated serial communication lines. Equipped with RS-232 to RS-485 bi-directional serial communication converter, the PSC unit easily forwards any RFID transaction from the Reader (RS-485) to the controlling computer (RS-232) obtaining continually and real-time monitoring.

## 2. Warnings and Cautions

- This device required to be connected to a certified power source 24VDC / 14W min..
- To avoid damaging, please follow the installation instructions.

### **ATTENTION**

- Hi-G-Tek's Compact Reader is distributed to a commercial/industrial use only, and should only be handled by personnel authorized by Hi-G-Tek representatives.
- Installation must be performed according to this User Guide.
- Using only certified antennas: It is the responsibility of the installer to ensure that when using the outdoor antenna kits in the United States (or where FCC rules apply), only those antennas certified with the product are used.
- The use of any antenna other than those certified with the product is expressly forbidden in accordance with FCC rules CFR47 part 15.204 and part 15.203.

### **The FCC Wants You to Know**

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:

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

### **FCC Warning**

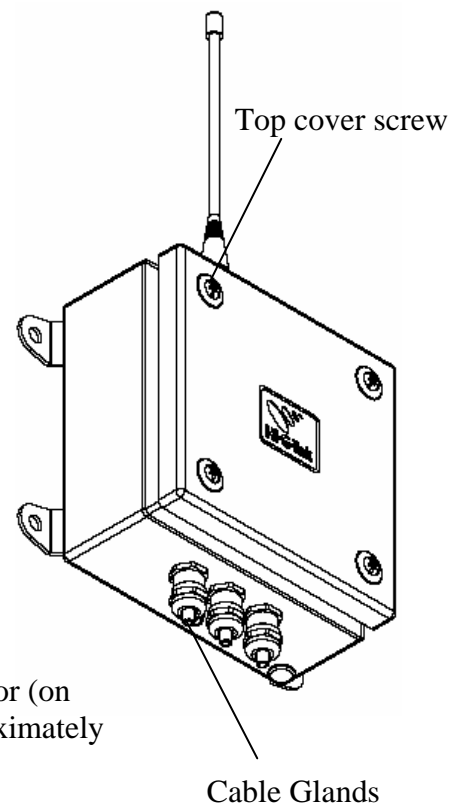
Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.

### ***Instructions concerning human exposure to radio frequency electromagnetic fields:***

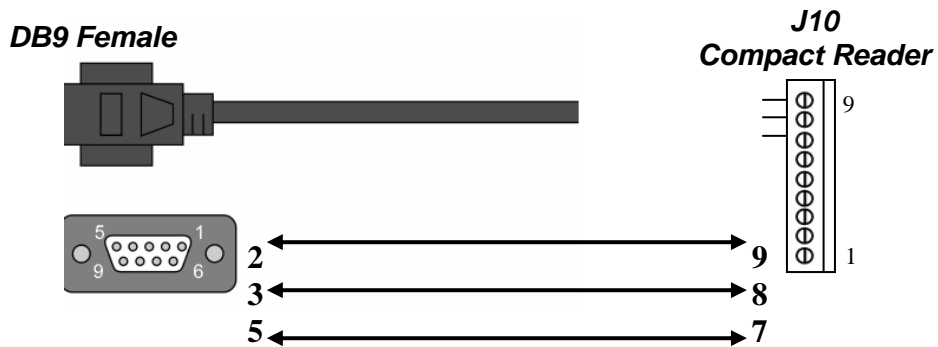
*A distance of at least 20cm. between the equipment and all persons should be maintained during the operation of the equipment.*

### 3. Installation Instructions

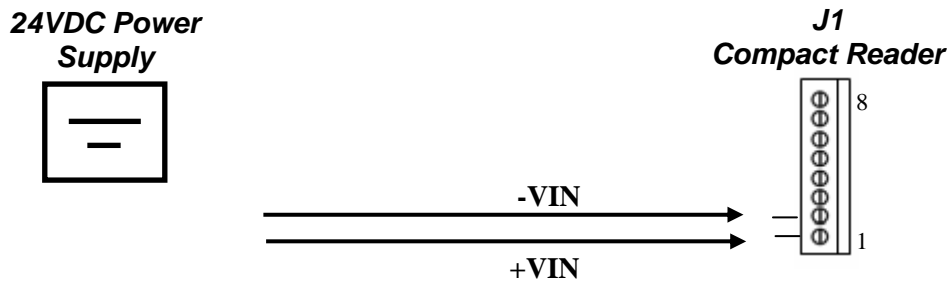
1. Unscrew the front panel screws and carefully dismantle the top cover of the Compact Reader.
2. Insert power \* and RS485 communication cable (from PSC unit) through the left cable gland.  
  
\* 24VDC for IG-CR-46D-XXX, 48VDC for IG-CR-86D-XXX
3. Wire J1(screw-on terminal block) as shown figure1.3 (page.4)
4. Ensure cables are properly wired, tighten the cable glands to obtain optimum sealing.
5. Connect the RS232 communication cable from the PSC unit to the PC (COM port)
6. Switch on the external power supply, observe the Power indicator (on the bottom side of the Reader) - the indicator flashes for approximately 5 seconds and remains illuminated.



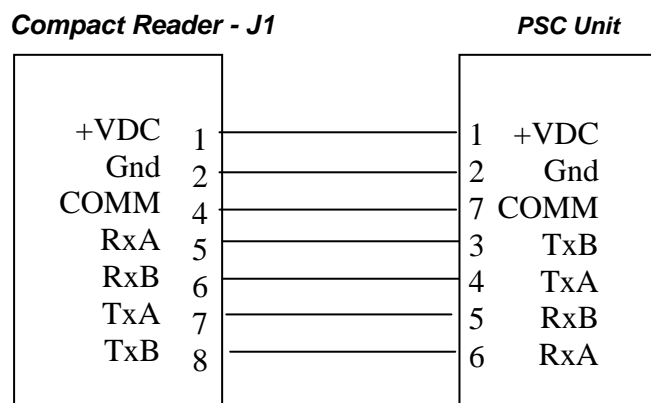
**Figure 1.1: RS232 connection diagram**



**Figure 1.2 : Power connection diagram**

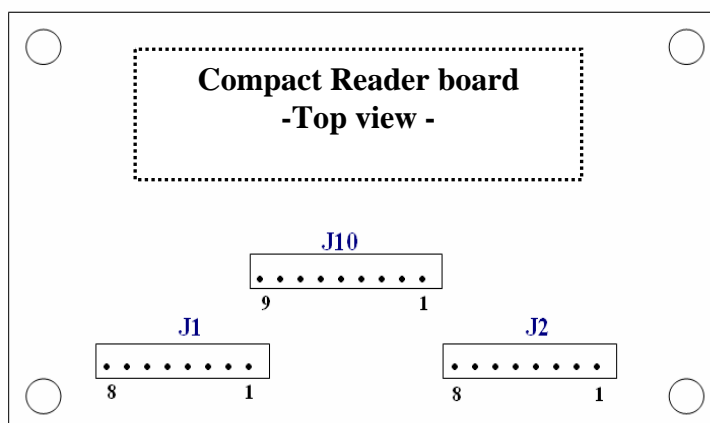


**Figure 1.3: Compact Reader - PSC Unit – RS485 Full duplex interconnection**



## Annex 1

### Compact Reader pinout



<i>J1 , J2</i>	
<i>PIN</i>	<i>DESCRIPTION</i>
1	+VIN
2	-VIN
3	SHIELD
4	SIGNAL GND
5	RxA (RS485)
6	RxB (RS485)
7	TxA (RS485)
8	TxB (RS485)

<i>J10</i>	
<i>PIN</i>	<i>DESCRIPTION</i>
1	EXT. IN
2	GND
3	EXT.OUT1
4	EXT.OUT2
5	EXT.OUT3
6	OUTS-GND
7	RS232- GND
8	RS232-RXD
9	RS232-TXD

## **Annex 2**

### ***Technical spec.***

#### **RF Characteristics**

UHF Tx/Rx Channel (Operating Frequency)	916.5 MHz or 433MHz (different models)
Range	Up to 100m ( within open space)

#### **Interfaces**

Serial comm.	RS232 for administration and isolated RS485
Antenna	50 ohm, whip (supplied)
I/O's	Isolated 3 Outputs & 1 Input (active low)

#### **Power Requirements**

Power supply type:	24V or 48V powered from PSC Unit.
Power Consumption	1W Max

#### **Physical Characteristics**

Dimensions	150x150x80mm (5.9"x5.9"x 3.15" inch)
Weight	1580gr (3.4 Lb)

#### **Environmental**

Operating Temperature	-40°C to +70°C
Storage Temperature	-40°C to +80°C
Protection Class.	IP 65

#### **Standards**

FCC (for 916 MHz models)	part 15C, sub part B- class B, sub part C.
CE (for 433 MHz models)	EMC /RADIO /SAFETY full compliance.
Safety cTUVus (pending)	UL 60950-1 / CSA CS22.2 60950 -1

#### **Models:**

<b><i>Compact Reader</i></b>	
IG-CR-46D-433	Power : 24VDC, Operating Freq: 433.92MHz
IG-CR-86D-433	Power : 48VDC, Operating Freq: 433.92MHz
IG-CR-46D-916	Power : 24VDC, Operating Freq: 916.5MHz
IG-CR-86D-916	Power : 48VDC, Operating Freq: 916.5MHz
<b><i>PSC unit (Power supply &amp; communication unit)</i></b>	
IG-PS-4RI	Input: 100 ~ 240VAC, Output:24VDC, 14.4W
IG-PS-8RI	Input: 100 ~ 240VAC, Output:48VDC, 14.4W