

IP3911-2 SUPER ELITE READER

QUICK START MANUAL



PRECAUTIONS FOR USE

It is recommended that the following operational concerns be addressed before operation of the reader for the first time and before operation of the reader after a significant period of disuse.

- i. Fully charge the reader's internal battery before the first use of the reader.
- ii. Fully charge the reader's internal battery before events.
- iii. The reader's internal battery should be fully charged every two months in the case that the reader unit has not been recently used. This should be done so that the battery is maintained in correct and working order.

WHAT IS IN THE BOX

1x IP3911-2 Super Elite Reader

1x Power supply

1x External Buzzer

1x Battery cable kit

1x External GPS antenna

1x Memory stick

1x Ethernet cable

REVISION HISTORY

VERSION	DATE	PURPOSE
1.0	10 Sept 2015	Created
1.1	17 Nov 2015	Release for use

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1. INTRODUCTION

The purpose of this document is to detail the functional parts, functions, operations and capabilities of the IPICO Sports Super Elite Reader. Please note that the following capabilities, functions and operations can be affected by setup environment. It is recommended that users fully read this manual in order to obtain optimal system performance.

2. SUMMARY OF CAPABILITIES / FEATURES

- This is a Octal v 1.3+ based reader. Connection to this reader is compatible to Elite readers.
- Accurate timing based on internal GPS (external antenna included) or NTP or local host settings
- Reliable solidstate datastorage
- 2 port Ethernet switch for easy daisy chaining other reader or TCP/IP devices on a local network – upto 100 simultaneous connections to 1 reader
- 2 USB ports for WiFi , GPRS, Bluetooth LE or memory stick dongles
- Fast boot up and shutdown cycles
- Soft reset from front panel
- LCD for critical user feedback and device status plus LED /Buzzer feedback
- Audio output socket to drive a 1W speaker direct
- Extended diagnostic ie. Internal Battery voltage, Field strength, Box Temperature and lots more
- Simple UP/DOWN/ENTER button interface to the menu system
- IP address Profile storage for easy on the fly reconfigurations
- Ability to drive 2x 5M mats or 4x 2.5m mats. A second reader can be used as independent backup. With 2 readers, a 10m (30ft) wide start / finish are possible.
- Internal power supply by battery for mobile applications
- External power supply provides 13.85 Volts DC
- External connectors for supplementary power supply / 12V battery / Fast charger
- Input connectors for date-time triggers (can be used with an acoustic coupler for gun starts)
- Power management : audible/Visual indicators/warnings on low Battery or external reverse polarity or under/overvoltage conditions ranging from a shortcircuit to 72 VDC
- One On/Off rotary switch for simple operation
- LEDs and internal buzzer for notification of tag read/detection
- Optional outputs for external buzzer (Product Code IP2911)
- Digital signal processing to increase detection of tags in electromagnetically intense environments
- Internal automatic radio-frequency tuning
- Durable aluminum/polycarb road case
- Venting for reader to adjust to ambient temperature in warmer climates

3. READER OVERVIEW



Figure 1 SUPER ELITE READER INTERFACE

- | | |
|--------------------------------------|----------------------------|
| 1. Main Panel | 5. Octal Module |
| 2. Receiver (RX) Module Left (0) | 6. Transmitter (TX) Module |
| 3. Receiver (RX) Module Right (1) | 7. Power Supply Module |
| 4. External Triggers / Buzzer In/Out | |

3.1 MAIN PANEL

Figure 2 MAIN PANEL describes all the cable connections required for antenna Transmitters and External powersupply options.



Figure 2 MAIN PANEL

- | | |
|--|-------------------------------|
| 1. Fast Charger (IP0904) / Power Supply Input (Max 13.85VDC) | 5. TX A – 0° (Green) |
| 2. Power Supply / 12V Battery Input (Max 13.85VDC) | 6. TX B – 180° (Blue) |
| 3. TX B – 0° (Yellow) | 7. On/Off Rotary Power Switch |
| 4. TX A – 180° (Red) | |

When switching the Power Switch (7) On for about 2 sec and then OFF again the reader will perform a “Lamp test” mode that will display the current IP address for approximately 5 seconds.

3.2 RECEIVER MODULES

The IPICO Sports Super Elite Reader has 2 dual-channel Receiver modules. These units collect tag data from the Receive (RX) loops in the connected mats. As tags are read, the modules emit audible read signals.

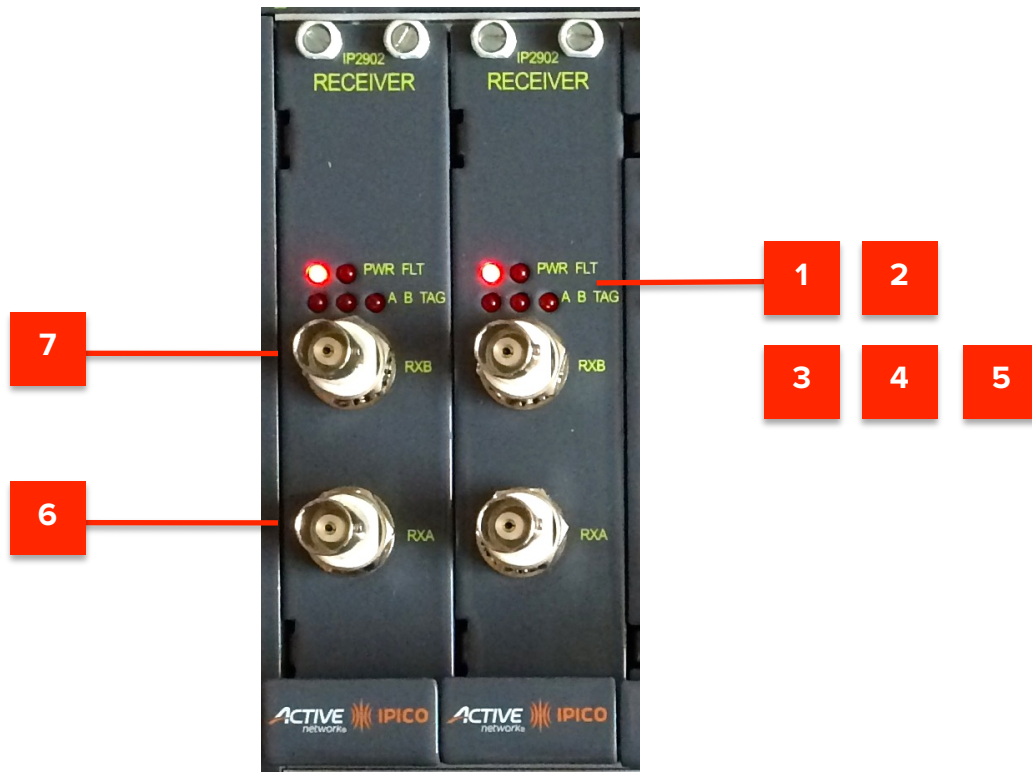


Figure 3 RECIEVER MODULES

- | | |
|----------------------------------|-----------------------------|
| 1. Receiver Unit Power Indicator | 5. Tag Read Indicator A / B |
| 2. Fault Indicator | 6. Receiver (RX) A Socket |
| 3. Tag Reads on Ch A Indicator | 7. Receiver (RX) B Socket |
| 4. Tag Reads on Ch B Indicator | |

1. Receiver Unit Power Indicator

This indicator's LED will light up when the reader is powered. This LED indicates that the receiver unit has power.

2. Fault Indicator

This indicator's LED light will only appear when there are communication issues in the receiver.

3-5. Tag Read Indicators (A,B,TAG)

The receiver modules have three tag read indicator LEDs. The A and B LEDs represent the RX A, and RX B sockets. The TAG indicator lights when the receiver is sending information to the Delta module.

6 -7. Receiver (RX) A / B Sockets

Connection for the small, round connector (BNC connector) of the timing mats. While it does not matter which connector is connected to which receiver socket, it is advised that mat order be kept consistent. The specific channel from which data is read can be decoded from the datastring. (refer to par **Error! Reference**

source not found.)

3.3 OCTAL MODULE

The Octal module is the central processing unit of the reader that has 5 major functions namely :

- Accurate clock management that synchronises to GPS, NTP or Local host timesources.
- Buffer/Store tag data from the 2 Receiver cards on solidstate memory. No CF card.
- Process / Filter tag data / diagnostic data and user commands
- Manage communication of various internal and external devices
- Ease to use user interface that includes audio/visual feedback and push button inputs

The Octal is equipped with an OLED display for user feedback during Charging, Power Up/Down and Operational modes . Refer to APPENDIX A – OCTAL MENU . When the reader is switched on it will take less then 40 seconds for the Octal to startup and be ready to process, buffer and communicate data to a host via Ethernet or GPRS modem. Raw tag data or FS/LS data can be streamed in realtime/ simultaneously on different ports of the IP address or downloaded via Dashboard or by inserting a memory stick in one of the USB ports. The Octal's Real time clock will operate for 2 days, without the use of rechargeable batteries, when reader is switched OFF.

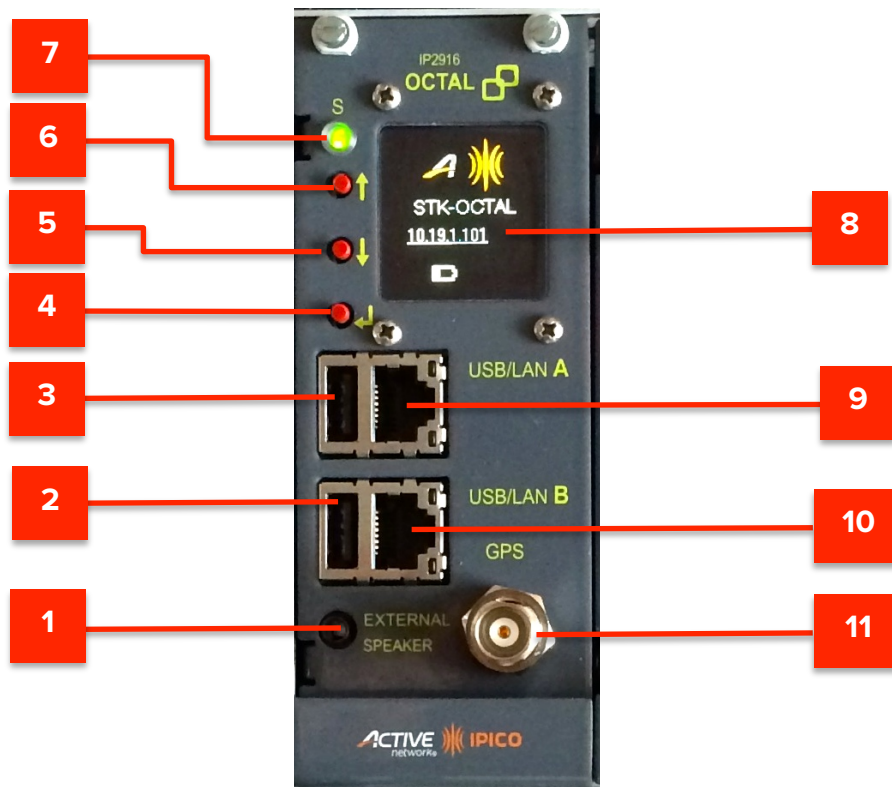


Figure 4 OCTAL MODULE

- | | |
|-------------------------------|-------------------------------|
| 1. External speaker interface | 7. Status LED |
| 2. USB B – for GPRS/Memstick | 8. Graphical Display |
| 3. USB A – for GPRS/Memstick | 9. Ethernet A (RJ45) |
| 4. Enter button | 10. Ethernet B (RJ45) |
| 5. Scroll down button | 11. Ext GPS Antenna connector |
| 6. Scroll up button | |

1. The External Speaker output (For future use)
- 2, 3. USB Connections for GPRS modems or memory sticks.
4. The “Enter” button is used to select an option displayed on the OLED display.
- 5, 6. The “Down”/”Up” buttons are used to move through the display menu.
Holding the “Enter” and the “Up” button in simultaneously for 5seconds will initiate a soft reset of the Octal. The Octal will restart in less then 40 seconds.
7. The Status LED will flash with a Green “Heartbeat puls” if everything is OK. Flasing Red will indicate an critical Octal error that can result in no functionality.
8. OLED display that allow for user feedback and minimal input. Default is a homescreen that will always show the current reader Name, IP address and internal battery status.
- 9, 10. LAN A and B connections can be used to Daisy chain readers. Readers at a split point can be linked together and one reader in the cluster can have a GPRS connection /VPN back to the host network.
11. The Octal has an onboard GPS module. To use this option to get Geo location and GPS time, the user must connect the external active antenna in an open space to pickup the GPS satalites. Once the GPS has lock it will display a (G) left of the timestamp on the homescreen.

3.4 TRANSMITTER MODULE

The reader's Transmitter module provides power to the mats in order to create the different frequency radio fields used to power and read IPICO Sports tags.

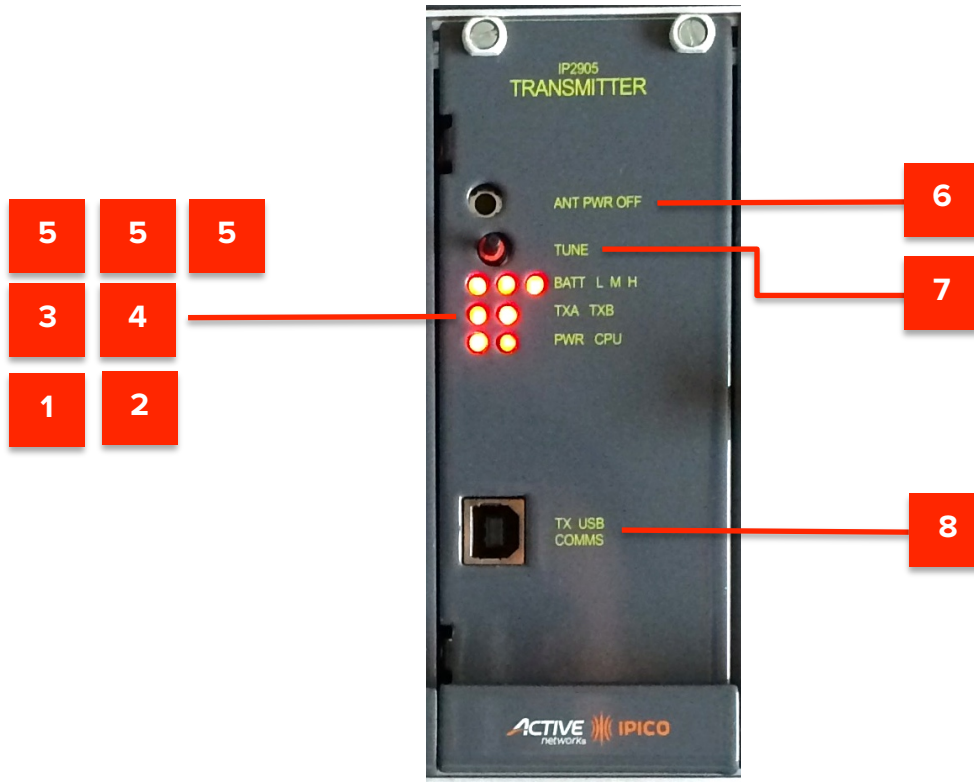


Figure 5 TRANSMITTER MODULE

- | | |
|-------------------------------------|-----------------------------|
| 1. Transmitter Power Indicator | 5. Battery Level Indicator |
| 2. CPU Activity Indicator | 6. Antenna Power Off Switch |
| 3. Transmitter (TX) A Tuning Status | 7. Manual Tuning Switch |
| 4. Transmitter (TX) B Tuning Status | 8. Transmitter Console Port |

1. Transmitter Power Indicator

This indicator will be lit when the reader is powered to indicate that the Transmitter module is also powered.

2. CPU Activity Indicator

This LED indicates that the microprocessor located on the Transmitter module is working correctly. When operating, this LED will flash at half-second intervals.

3. Transmitter (TX) A Tuning Status

Transmitter (TX A) supports two mats with a 0deg and 180 deg phase shift. If the mats are not rolled out completely or are lying on top of the other loop or on top of a surface that contains metal structures, it will be detuned and this LED will flash together with an audible detuned signal.

4. Transmitter (TX) B Tuning Status

Transmitter (TX B) supports two mats with a 0deg and 180 deg phase shift. If the mats are not rolled out completely or are lying on top of the other loop or on top of a surface that contains metal structures, it will be detuned and this LED will flash together with an audible detuned signal.

5. Battery Level Indicator

The three LEDs comprising the Battery Level Indicator, marked “L,” (Low) “M,” (Medium) and “H,” (High) indicate the voltage level being supplied to the Transmitter unit. As this voltage is managed by the Power Supply Module (see below), the voltage indicators should always remain in either the “M” (Medium) or “H” (High) range.

6. Antenna Power Off Switch

The Antenna Power Off switch disables power routing to the timing mats, and discontinues the reader’s ability to obtain tag reads. When the antenna power is off, a continuous tone is heard to indicate that this switch has been pressed. To re-enable power routing to the timing mats, simply press it; the tone will cease and the mats will regain power.

7. Manual Tuning Switch

Pressing this switch begins the reader’s mat tuning process, a process that takes place every 5 (five) minutes. If timing mats are connected to the reader at the time of startup, the reader will automatically tune to the given mat state. However, if mats are added after powering the reader, a rapid series of “beeps” will be heard. This indicates that the reader’s tuning process has recognized that new mats need to be tuned. Press the Manual Tuning Switch to tune the reader to the current mat state.

8. Transmitter Console Port

This port is for maintenance purposes only. It is not accessible by the user, and should only be used by IPICO Sports technical staff, unless otherwise indicated.

3.5 POWER SUPPLY MODULE

The Power Supply Module manages the power supply and distribution to the IPICO Sports Super Elite Reader.

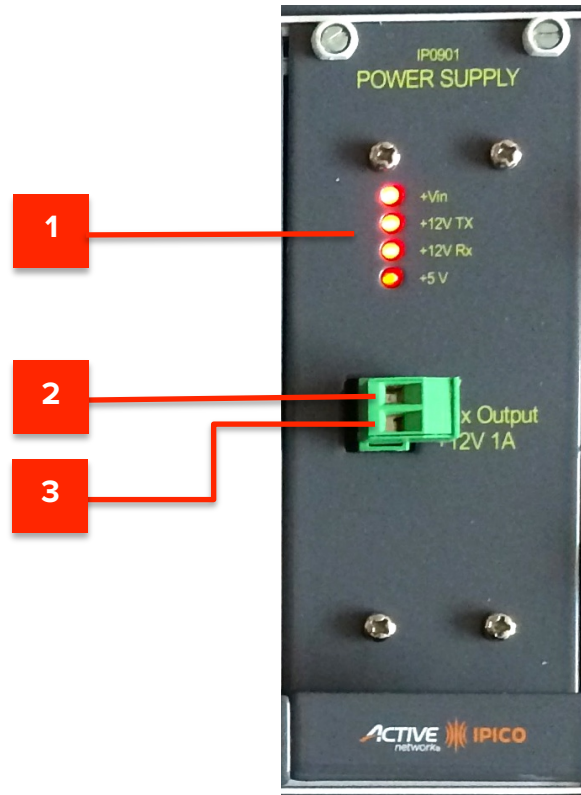


Figure 6 POWER SUPPLY MODULE

- | | |
|-----------------------------------|-----------------------------------|
| 1. Power Supply Indicators | 3. Auxiliary Output, Positive Pin |
| 2. Auxiliary Output, Negative Pin | |

1. Power Supply Indicators

These indicators refer to their various (labeled) power levels. The +Vin LED refers to the power coming into the Power Supply module from the battery. The +12V TX indicator represents the power routed to the operation of the Transmitter (TX). The +12V RX indicator shows the status of power being routed to the Receivers (RX).

2. Auxiliary Output, Negative Pin

This is the 12V return (GND) Pin

3. Auxiliary Output, Positive Pin

This is the 12V (POS) Pin and capable of delivering 1A to devices such as network equipment (routers, switches, et al.).

3.6 UNIT TOP PANEL

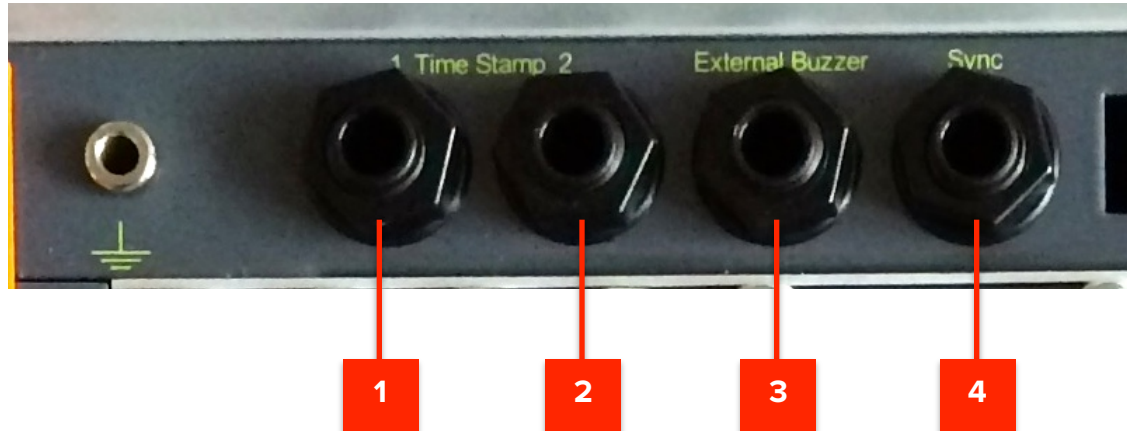


Figure 7 UNIT TOP PANEL

1. Time Stamp 1
2. Time Stamp 2

3. External Buzzer Connector
4. Synchronization Connector

1. Time Stamp 1

This connector accepts connections such as acoustic couplers (starting guns) or external switches. When the external source connected to this connector is initialized or used, the reader simply inserts a time stamp into the reader's maintenance file.

2. Time Stamp 2

This connector accepts connections such as acoustic couplers (starting guns) or external switches. When the external source connected to this connector is initialized or used, the reader simply inserts a time stamp into the reader's maintenance file.

3. External Buzzer Connector

The External Buzzer Connector is reserved for use with a 12 Volt DC external buzzer unit (Product Code – IP 2911).

4. Synchronization Connector

This connector is reserved for future hardware and software development.

4. READER SETUP

NOTE: To connect directly to an IPICO Sports Super Elite Reader, the use of the orange crossover cable provided or a compatible alternative (CAT 5E, CAT 6 crossover cabling) is required. For more detail please refer to the Dashboard help guide.

4.1 NETWORK CONFIGURATION

The Octal always display its current IP address on the homescreen. Set your computer to be on the the same network subnet. Using Dashboard v 3.1.0.9+ will allow easy setup of the readwer parameters.

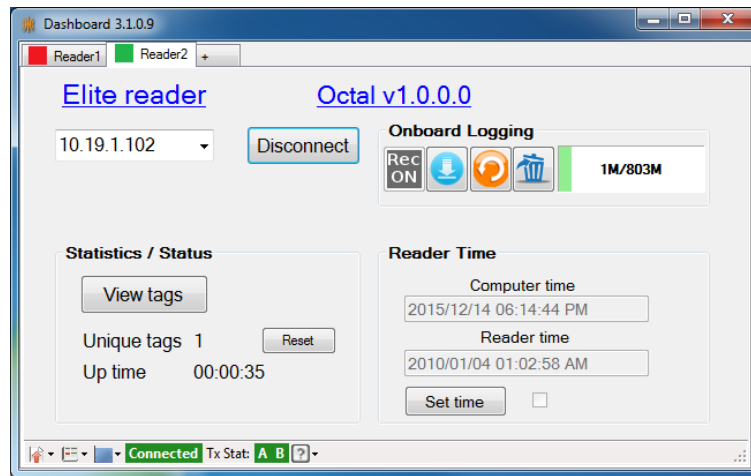


Figure 8 Dashboard mainscreen

Click on [Elite Reader](#) to enable the EliteInfoForm page below. Click on GET to retrieve the current parameters. Change the IP address under Network to the desired new reader address and click SET. The parameter will be set instantly. The computer will loose communication but will reestablish the connection in a few seconds.

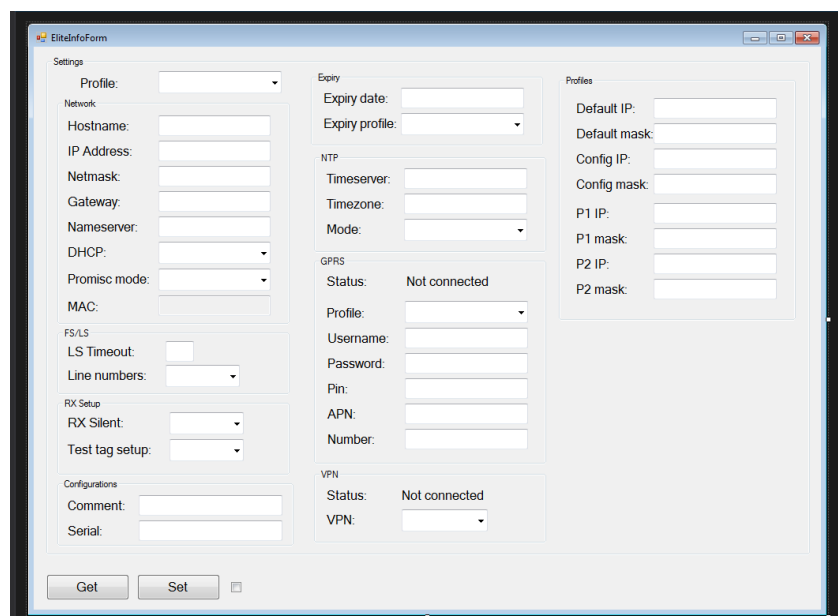


Figure 9 Elite Info screen

FS/LS

LS Timeout

The Last Seen Timeout setting determines the amount of time between each “First Seen” and “Last Seen” read on reader port 10200 (the First-Seen, Last-Seen port). The default value is 5 seconds. To save any changes made to this setting, click the “Save” button located in the lower left-hand corner of the screen.

Linenumbers

When enable, a line number will be append to the ID string. This is usefull if there was a communication breakdown between the reader and the host. When the connection is reinstated the user can see if there was a “gap” in the data. Missing records can then be retrieved from the reader.

GPRS (GENERAL PACKET RADIO SERVICE)

1. Carrier Profile

The IPICO Sports Super Elite Reader supports the following G.P.R.S. (General Packet Radio Service) providers:

- A1 (Austria)
- Aon (Austria)
- Orange (France)
- Vodafone (New Zealand)
- AT&T (United States)

Use this drill-down menu to select your G.P.R.S. (General Packet Radio Service) provider.

2. Username

Depending upon the preferences of your chosen carrier, you may be required to provide a network username in order to use your G.P.R.S. (General Packet Radio Service) subscription. Please verify all necessary network details with your service provider.

3. Password

Depending upon the preferences of your chosen carrier, you may be required to provide a network password in order to use your G.P.R.S. (General Packet Radio Service) subscription. Please verify all necessary network details with your service provider.

4. P.I.N. (Personal Identification Number)

Depending upon the preferences of your chosen carrier, you may be required to provide a network access P.I.N. (personal identification number) in order to use your G.P.R.S. (General Packet Radio Service) subscription. Please verify all necessary network details with your service provider.

5. A.P.N. (Access Point Name)

Depending upon the preferences of your chosen carrier, you may be required to provide a network A.P.N. (access point name) in order to use your G.P.R.S. (General Packet Radio Service) subscription. Please verify all necessary network details with your service provider.

6. Number

Depending upon the preferences of your chosen carrier, you may be required to provide a specific network number in order to use your G.P.R.S. (General Packet Radio Service) subscription. Please verify all necessary network details with your service provider.

The Octal will be able to interface with more popular GPRS modem types as it comes available.

NETWORK CONFIGURATION

1. Reader Identifier Field

The setting occupying this field designates a physical name for the given Super Elite Reader Unit. NOTE: WHILE ANY NAME CAN BE GIVEN TO A READER, THE SETTING IN THIS FIELD MUST NOT CONTAIN ANY SPACES.

2. Dynamic Network Settings Option

This option allows a host network to assign the Super Elite Reader network settings. For this setting to successfully work, the reader must be connected to a network where a DHCP (Dynamic Host Configuration Protocol) server is in operation. This option is meant for use if there is a known DHCP (Dynamic Host Configuration Protocol) server resident on the network. If no server of this type is found, and the “Start DHCP Server” checkbox is checked, the reader will automatically become a DHCP (Dynamic Host Configuration Protocol) server if none is found.

3. DHCP (Dynamic Host Configuration Protocol) Client Option

Similar to the Dynamic Network Settings Option discussed above, this option allows for the dynamic configuration of the reader’s network settings according to DHCP (Dynamic Host Configuration Protocol). However, this option should be used when there is a DHCP (Dynamic Host Configuration Protocol) server on the network, but its address or location is unknown, as the reader will scan the network for this server and attempt to use it to obtain an address.

4. Manually-Configured Network Settings Option

Using this option allows the user to manually configure the reader’s network options. Using this feature will establish a “static” (constant) reader network address.

a. IP (Internet Protocol) Address Field

This field defines the Super Elite Reader unit’s IP (Internet Protocol) address. This address refers to the network location of the reader and is the address at which the user will access the reader. When modifying this setting, ensure that the address is unique (not repeated on another reader or device that currently resides on the network).

b. Network Mask Field

The Network Mask setting for IPICO Sports Super Elite Readers is set to 255.255.255.0 by default. This setting is assigned before shipping the reader and should not be modified except by users with advanced networking experience or direction from a user with advanced networking experience.

c. Gateway Field

The value listed in this field is that of a network gateway, typically a router or a server machine. The default value of this setting is 10.19.1.1, unless the reader’s IP (Internet Protocol) address has been requested to be different or has been changed by another user. For most networks, the gateway is an IP (Internet Protocol) whose last two octets are “1.1,” however this may be different depending on network or computer settings. It is recommended that this value be changed only by those users with advanced networking knowledge.

d. DNS (Domain Name Server) Server Field

“Search” is set as the default setting for this field. When populated, this field should contain the address of a DNS (Domain Name Server) server. This setting only applies to those networks which have domain names, and typically basic or intermediate race timing networks do not contain a DNS. It is recommended that this value be changed only by those users with advanced networking knowledge.

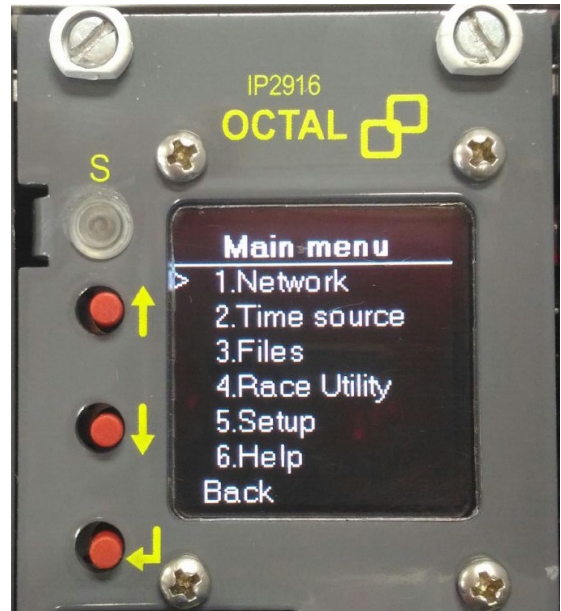
e. Start DHCP (Dynamic Host Configuration Protocol) Server Option

Enabling this option will cause reader to become an independent DHCP (Dynamic Host Configuration Protocol) server. When enabled, the reader will serve addresses to all resident network devices starting from the lowest open address up to ten (10) addresses below the reader IP (Internet Protocol) address and ten (10) addresses above the reader’s own address. For example, a reader addressed at 10.19.1.101 would issue addresses 10.19.1.1 to 10.19.1.91 and then 10.19.1.111 to 10.19.1.255.

PROFILES

This allows the user to predefine 2 additional IP address profiles, that can be selected directly from the reader via the menu system.

5. APPENDIX A – OCTAL MENU



6. APPENDIX C – INTERNAL READER BATTERY MANAGEMENT

PRECAUTIONS

It is recommended that the following operational concerns be addressed before operation of the reader for the first time and before operation of the reader after a significant period of disuse.

1. Fully charge the reader's internal battery before the first use of the reader.
2. Fully charge the reader's internal battery before events.
3. The reader's internal battery should be fully charged every two months in the case that the reader unit has not been recently used. This should be done so that the battery is maintained in correct and working order.
4. Should an external battery be connected to the Super Elite Reader after the battery alert is tripped (a long, continuous audible noise), this alert will continue to sound. This is normal, and the reader will continue operation, but the alert will still be tripped.

TYPICAL CHARGING CHARACTERISTICS

TYPICAL CHARGE CYCLE	9 hours (Mains Charger, IP-0903)
	3 hours (Fast Charger, IP-0904)

7. APPENDIX D – READER SPECIFICATIONS

Reader power consumption: 6Amps

External power supply: 12Vdc, 6Amps

Battery:

Characteristics: 12V, 17Ah, 6Kg

Time life: 4 years

Autonomy: 2.5 – 3.5h when fully charged

Hibernation: 30-40h when fully charged (Future)

Charge time: 9h with 12Vdc/ 6Amps charger. 3h with IPICO fast charge charger.

Weight: 18Kg

Dimensions: 285mm H x 325mm W x 370mm L (112in H x 128in W x 146in L).

Temperature rates (mats and reader): 0°C to 50°C

IP protection:

Reader open: IP21

Reader closed: IP54

Mats: IP68

Warranty 1 year

8. APPENDIX E – TROUBLESHOOTING

STARTUP

RECEIVER MODULES

When the unit powers on, if the Receivers' "PWR" LEDs are not lit, this may indicate that the module is not seated correctly in the reader. To re-seat the module, simply unscrew it, take it out, and carefully slide it back in. This will re-connect all the pins on the card with those internal to the reader.

OCTAL MODULE

Status codes will be displayed on the OLED display.
Definitions will be displayed in the Help menu.

TRANSMITTER MODULE

When booting the reader, the Transmitter module may emit a constant beep, indicating that the reader's mat connections, the TX connections, are out of tune. The reader may attempt to tune when turned on, indicating this state. To tune the reader, press the "Tune" switch on the front of the Transmitter module to tune the reader, rather than waiting for the tuning process to be executed every five minutes. After connecting mats, the readers will likely need to be retuned using the same process.

If the reader is tuned, but continues to emit a constant beeping and the TXA and TXB LEDs on the front panel of the Transmitter module are still flashing (alternating rapidly), the antenna power may have been turned off. To turn this process back on, locate the button labeled "ANT PWR OFF," located on the Transmitter module. After pressing this button, the reader should stop beeping, and antenna power should be restored.

DATA STREAMING

If data streams (ports 10000, 10200, 10201) are unresponsive, restart the Octal module by doing a soft reset. After a full restart, the streaming ports should perform normally. This can also be the case with the input port (9999). If trouble with data streaming continues, restart the system by turning the power knob into the "Off" position. Allow all of the modules to complete their shutdown process.

EQUIPMENT SETUP

During race day testing, it is important that the data files on the reader are being constantly augmented with data. During pre-race setup, once the readers are fully initialized, ensure that these files are accepting contemporary data. Use Dashboard to access the data files on the reader or alternatively the current FTP functionality by opening a web browser or FTP client and navigating to your reader's IP address. For example, if a reader's address is 10.19.1.101, the FTP portion of the reader can be accessed by opening a web browser and typing "ftp://10.19.1.101" into the Address bar. If using an FTP client, use the IP address as the FTP address