intelleflex®

XC3 Technology™

FMR-6000 User Manual
Reader Software Version 3.2.x

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ICES-003
This Class [*] digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe [*] est conforme à la norme NMB-003 du Canada.

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.

IC RSS
This device complies with Industry Canada License-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Note: 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 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 or more of the following measures: Reorient or relocate the receiving antenna, Increase the separation between the equipment and the 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.

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Caution
This device should be operated with a minimum distance of at least 32 cm between its antennas and a person's body in keeping with RF exposure limits in Council Recommendation 1999/519/EU

Table of Contents

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1. Introduction

The Intelleflex Fixed Multi-Protocol Reader FMR-6000 is a fixed infrastructure RFID reader that provides extended capabilities with industry-leading range and read/write reliability. The FMR-6000 advanced design ensures easy field upgradeability to new enhanced features, as well as support for ISO 18000-6:2010 and EPC-global C1G2 industry standards.

Figure 2.1-1 The FMR-6000

This user manual describes the installation and operation of the Intelleflex FMR-6000 UHF RFID Reader using reader software version 3.2.x. This manual is intended for, but not limited to, Intelleflex RFID software developers integrating the FMR-6000 into a new or existing RFID solution.

2. The Intelleflex FMR-6000

2.1 Overview

The FMR-6000 can support connections through Ethernet, and can be triggered by up to two different relay networks through the opto-isolated GPIO connector, and connect up to two pairs of bi-static, circularly (or linearly) polarized antennas. Autonomous functionality of the reader is possible with the provided by the hosted internal application programs (agents) capable of communicating to the FMR-6000 and other local devices. These autonomous agents are able to push tag up to the Intelleflex ZEST® cloud-based Data Services.

Powering the FMR-6000 is done through a Power over Ethernet (PoE) connector. Powering the unit and setting up the LAN connection can be done one of two ways: connect the unit directly to a network switch or router that supports PoE, or by injecting power into an already existing LAN cable through a PoE injector power supply. (This is provided by Intelleflex with the FMR-6000).

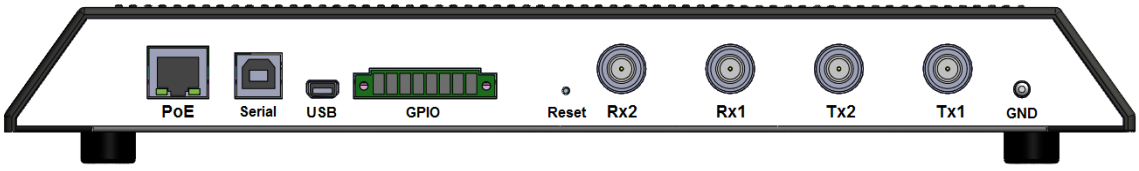


Figure 2.1-1 FMR-6000 Back Connector Panel

When using the FMR-6000, be sure to always have antennas connected to at least one pair of antenna ports – This is imperative to ensure proper behavior of the unit.

2.2 Hardware Specifications

SPECIFICATIONS

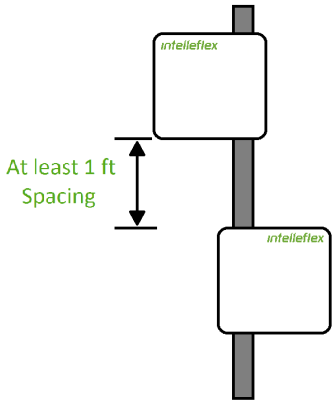
Physical Characteristics	
Dimensions	12.27 x 6.85 x 1.36 inches (311.62 x 174 x 34.5 mm)
Weight	2.9 lbs. (1.32 kg)
Connectivity	
External Interfaces	Ethernet RJ45, USB type mini AB, serial over USB type B, GPIO
RF Connector Type	Reverse Polarity TNC
Antenna Ports	2 transmit, 2 reverse (2 bi-static pairs)
Power Supply	IEEE 802.3af PoE 48V (single)
Protocol	
Standards	EPC C1G2 passive, ISO 18000-6C revision 1 Manchester BAP
C1G2 PIE forward link Tari	25 - 6.25 µsec
C3 Manchester forward link rates	8 - 128 Kbps
Miller backscatter link frequencies, M ratio	BLF: 80 - 320 KHz, M: 2 – 128
Reverse link data rates (BLF/M)	2.5 – 160 Kbps
Performance	
Tag maximum read rate	200 tag inventories/sec (C1G2)
Tag maximum range	C1G2 up to 10 m; C3 up to 100 m
Transmitter RF Output Power	0 to +30 dBm, 1 dB steps, +/- 1 dB accuracy
Receiver Sensitivity	-125 dBm at 2.5 Kbps
Frequency Range	EU 865-867 MHz, FCC 902-928 MHz; Regulatory dependent
Number of Channels	4 – 50; Regulatory dependent
Environmental	
Temperature	
Operating	0° to +55°C
Storage	-20° to +70°C
Humidity Standard	IEC 60068-30/78, 5-95% non-condensing
Vibration Standard	IEC 60068-2-6
Compliance/Certifications	
EMC	
Agency Listings	
RoHS	
Hardware And F/W Management	
Firmware Upgrade	Host based firmware upgrade capabilities
Host Interface Protocols	Serial port, HDLC formatting
Software Support	
Windows DLL	
XML	Multi-platform interface
Temperature sensor tag API	

.NET support	Compatible with Microsoft® .NET Compact Framework

2.3 Detailed System Specifications

2.3.1 Antennas

There are four Reverse Polarity (RP) threaded Neill-Concelman (TNC), RP-TNC, connectors on the FMR-6000. These connectors are separated into pairs, two are dedicated for transmit and two are dedicated for receive. At a minimum one pair of antennas needs to be connected: a "pair" consisting of one transmit antenna and one receive antenna.



Mounting hardware is provided with the antennas to easily attach antennas either to a pole or wall. A mounting instruction sheet is provided with the mounting hardware. Mount one antenna pair such that antennas are at least six feet above the ground. To maximize read range, space the Transmit (Tx) and Receive (Rx) antennas at least a foot apart. You can also mount the antennas side-by-side (horizontally) so long as a minimum separation of one foot is maintained. Be sure to verify the antennas are connected to the correct ports; the antenna's function is labeled on the back of the antenna.

Figure 2.3-1 Tx and Rx antenna spacing

Connect the Tx antenna to the Tx port on the reader, and Rx antenna to the Rx port on the reader. Use the supplied RF cables with reverse TNC connecters.

Two pairs of antenna pairs may be connected to the reader at any given time. When several Rx and Tx antennas are connected, the reader can be set up to transmit on any Tx port and receive on any Rx port.

2.3.2 Serial Connection

```
************************************
Prod: FMR-6000
Name: Intelleflex Reader
S/N: IA210430011
Ver: 3.0.2.0.707
Rel Date: 2010-10-27 12:24:37 -0700
IP: 10.1.6.139
netmask: 255.255.255.0
gateway: 10.1.6.1
broadcast: 10.1.6.255
mac: 64:7B:D4:08:10:AD
using DHCP: no
************************************
************************************
** Intelleflex Reader @ 10.1.6.139 **
**    3.0.2.0.707 - IA210430011     **
************************************
**
** 1 - Set static IP                **
** 2 - Set to DHCP networking       **
** 3 - Restore factory defaults     **
** 4 - Display network settings     **
** 5 - Reboot reader                **
**
************************************
```

There is a direct serial connection port on the FMR-6000 that allows for a PC to establish a connection with the reader through a standard USB cable. This creates a Virtual Communication Port (VCP) that allows PCs without serial ports to connect directly to the reader without buying a Serial to USB adapter. Drivers to support this feature can be found at the FTDI website, or by following the link provided:
USB Drivers

Once the driver is installed and the USB cable is connected to both the reader and the PC, opening up a serial connection can be done easily on both Windows or OS X for Mac based systems. To connect over serial on a specific system please see Appendix A for details. Use a Baud Rate of 115200, data 8 bit, Parity none, and Stop of 1 bit with no flow control. Once a serial connection is established to the reader connect the Ethernet cable using the

power injector (see next section for details). Allow the unit to boot. When the unit has booted all the way, you will see the print out on the screen as in Figure 2.3-2.

Figure 2.3-2 Serial Port Boot Output

2.3.3 Power over Ethernet (PoE) and Connecting to a Network

The Intelleflex FMR-6000 is powered via an RJ45 connector and two standard CAT 5 Ethernet cables. One cable plugs into the reader and into the power injector power supply provided by Intelleflex. This injector looks like a standard power supply but has two RJ45 ports on one side and a power cord socket on the other. Plug the reader's CAT 5 Ethernet cable into the "LAN + DC" RJ45 socket on the injector. Then using the other LAN cable, connect the "LAN" RJ45 socket into a standard DCHP router. Plug the power cord into a wall socket and insert it into the power injector. The "STANDBY" light should illuminate and the reader should begin booting.

Any 802.3af PoE compliant power sourcing equipment (PSE) such as a switch or hub that is capable of sourcing 15.5 watts will also work with the FMR-6000. If your infrastructure already has a PoE switch, ensure that it is 802.3af compliant before using it as a source of power instead of the supplied power injector.

2.3.4 Status and Activity LEDs

There are five active LEDs on the front right corner of the FMR-6000. They are used to see the status or activity level of the reader. When a reader is first plugged in, the *Power* LED will illuminate and stay illuminated until power is removed from the PoE.

The next two lights to turn on will be *Boot* and *Network*. ***Boot*** will light up when the host application is ready to accept connections. *Network* will light up when the DHCP client has started and is ready to accept a network connection from a DHCP server, or when the reader has assigned itself a static IP address.

Figure 2.3-3 (Cutaway) LED Activity and Status Lights

Transmit is a dynamic light that will flicker whenever the FMR-6000 is transmitting RF signals out of either of the antenna ports. This light does not necessarily indicate it is finding tags, only that RF is successfully being broadcasted from the reader. The light will flicker (or pulse) at a rate that is dependent on the length and duty cycle of the transmission. If the reader is assigned to read the full content of user memory, the light will be illuminated until the transmission has ended.

Fault is an error triggered LED that will stay illuminated if there is a system error. If the *Fault* light is illuminated on your FMR-6000 please contact Intelleflex Technical Support (information found at the beginning and end of this document) to get the reader serviced at your earliest convenience. *Note: The Fault light will be illuminated for a few seconds during boot and will then go out when the boot sequence has successfully completed.*

2.3.5 General Purpose I/O

There are four digital General Purpose Input and Output (GPIO) ports on the FMR-6000 that are accessed through the provided 8 pin screw head connector. There are two opto-isolated inputs, two open drain outputs, Ground pin, and +5v pin.

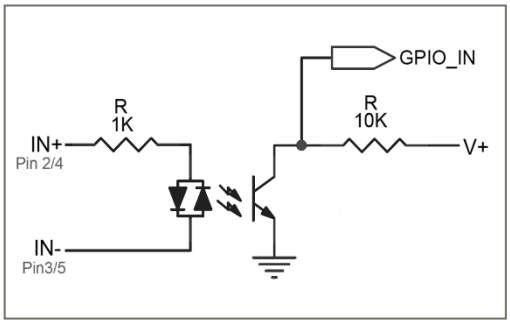


Figure 2.3-4 Optically Isolated Input Schematic

The inputs are differential optically isolated inputs. A differential input provided on the positive and negative side of each input will drive either a positive (logic 1) or negative (logic 0) voltage through the isolator. There is a 1k resistor in series with the positive input pin on each input. See the schematic in Figure 2.3.5.1.

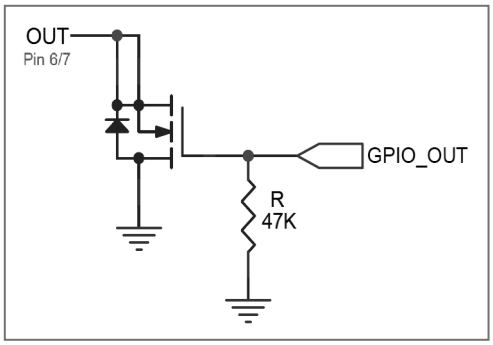


Figure 2.3-5 Open-Drain Digital Output

The outputs are open-drain, driven by a MOSFET, and will either drive the pin to a ground, closing the MOSFET, by providing a digital 1 logic level or become a high impedance output, opening the MOSFET, by providing a digital 0 logic level.

On the readers back panel, located just left of middle, is the green GPIO socket that the provided screw terminal fits into. The screw header fits securely into the socket and is tightened down with the two attached screws.

Looking at the reader, the pins are numbered left to right from eight (8) to one (1). See Figure 2.3-6 for details and Table 2.3-1 for the pin out.

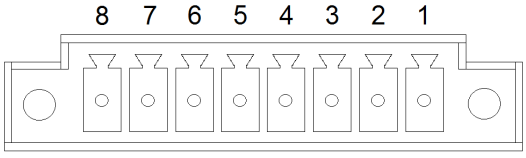


Figure 2.3-6 8 Pin GPIO Header (Looking at the Reader)

Table 2.3-1 Pin Description and Power Characteristics

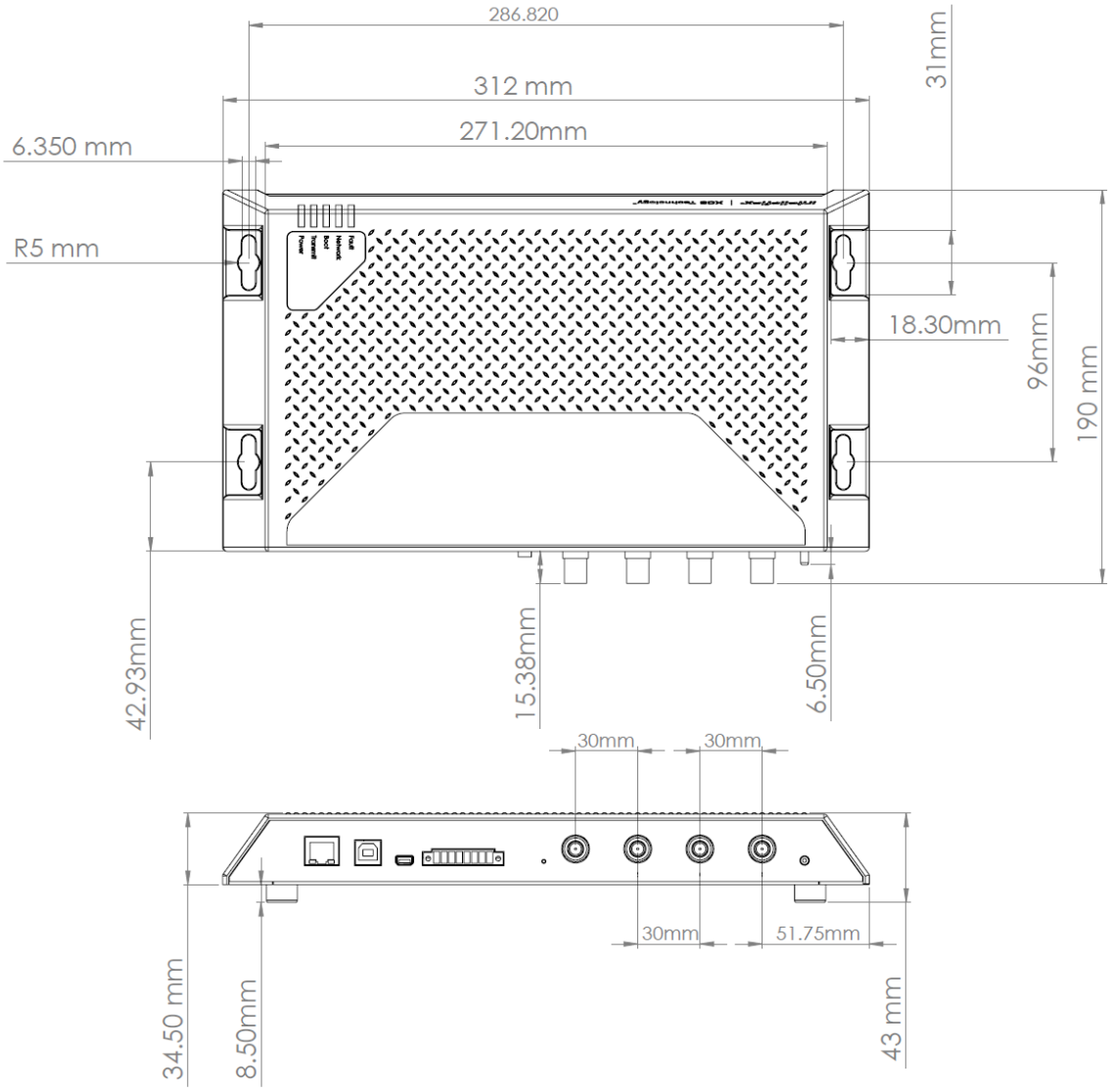
Pin	Description	Characteristics
1	Vdd	5v @ 50mA
2	IN 1+	Max Current

3	IN 1-	10mA
4	IN 2+	Max Current
5	IN 2-	10mA
6	OUT 1	62v@100mA Max
7	OUT 2	62v@100mA Max
8	GND	Ground

2.3.6 Reader Mounting

The case of the FMR-6000 has been designed with included mounting holes located on either side of the case. When mounting the reader, keep in mind the antenna cables and where they are going to route. If mounting the unit outside or in an industrial area, consider using a NEMA enclosure to protect the unit.

For wall mounting, recommended hardware is M5 Hex Cap Screw with 10mm washer , or A2 Stainless M5 Flange Hex Bolts (DIN 6921).



3. Reader Web Based Interface

The test interface to the FMR-6000 is a web browser enabled GUI through which the user may interact with the reader. This interface is based on a web server that resides on the reader. Through this interface, the user can set the reader's name, upgrade the reader with new firmware, choose a static IP address or enable DHCP, and check status and version numbers. The user can then inventory C3 or C1G2 tag IDs and interact with tag memory.

3.1 Establishing a Connection

The FMR-6000 reader supports only Mozilla Firefox 14.0.x or later. Internet Explorer is not currently supported.

For More information about obtaining the IP address of the reader please see Section 2.3.2. Once the reader's IP address is known, type in the IP address of the reader (e.g., http://10.1.7.90) into the browser address bar, the reader interface will appear and the status screen will be displayed by default.

3.2 Checking Versions and Status

Upon successfully connecting to the reader, the browser defaults to the status page. From this page the Firmware Version of the reader can be determined ("Software Version"), as well as the Serial Number and MAC Address.

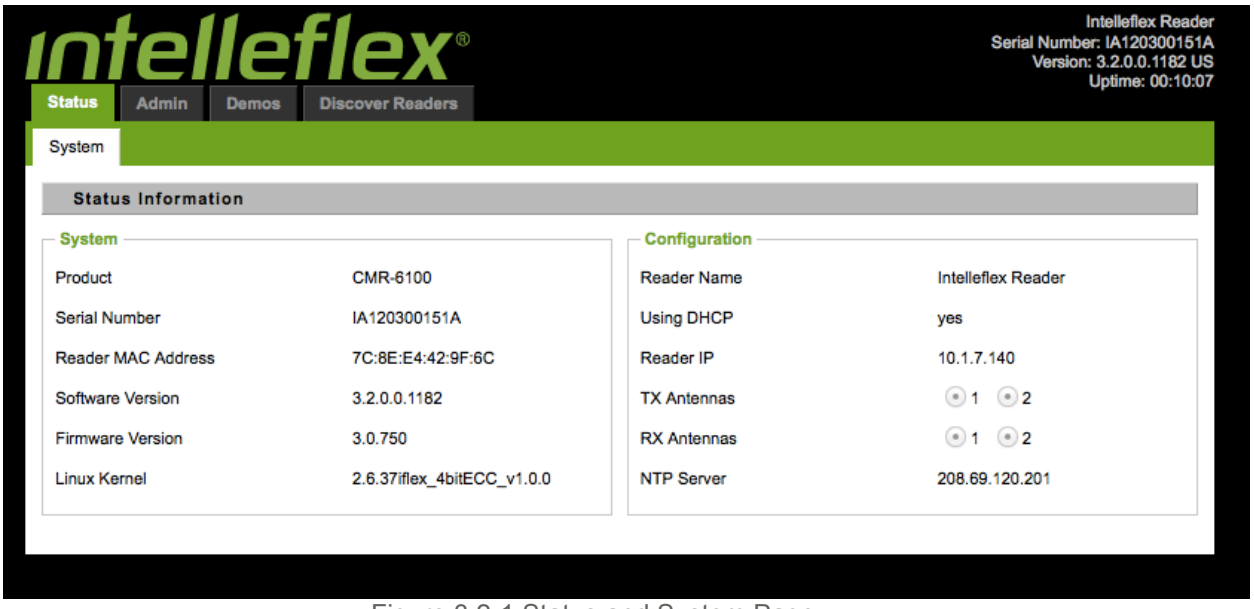


Figure 3.2-1 Status and System Page

3.3 Network Settings, WAN Setup, Web Services Configuration

Clicking on the Admin tab will bring up the Admin page. The reader's name can be changed by entering it in the Reader Name field and clicking on the Save Settings button, if the Save Settings button is not pressed the changes on the screen will not be committed.

The IP address of the reader can be derived from DHCP or set statically on the Admin page. If set statically get the information, including DNS server address, from your System Administrator before making changes. Incorrect DNS settings can cause problems with network connectivity. Also your web browser will be "lost" once the IP address is statically set and you must browse to the new IP address.

The Web Service Configuration section in this tab is where the information is entered to allow the FMR-6000 to push data to the Intelleflex ZEST® Data Services server. In order for the FMR-6000 to push data from tags to the server and make it visible to an end user, the reader and all the associated tags must be registered with the Data Services. See the ZEST Data Services Users Guide for detailed information.

Figure 3.3-1 Admin Management Page

3.4 Upgrading Reader Firmware

Upgrading the Firmware on the FMR-6000 is done through the “Firmware Upgrade” tab under “Admin”. Obtain the latest version of the FW through the Intelleflex website or contact the Intelleflex Support department if you believe that your firmware version is out of date or if you are experiencing any problems using the web based interface.

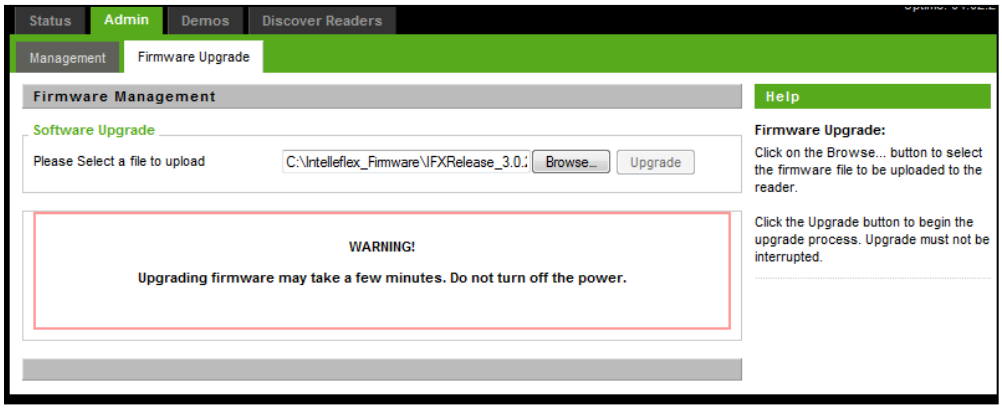


Figure 3.4-1 Reader Firmware Upgrade Page

3.5 Basic Inventory Demo

The Demo’s tag Inventory page is the main page used to interface with tags. From this page the user has the ability to inventory tags with different RF and reader parameters, read and write to tag user memory, and verify functionality of the system.

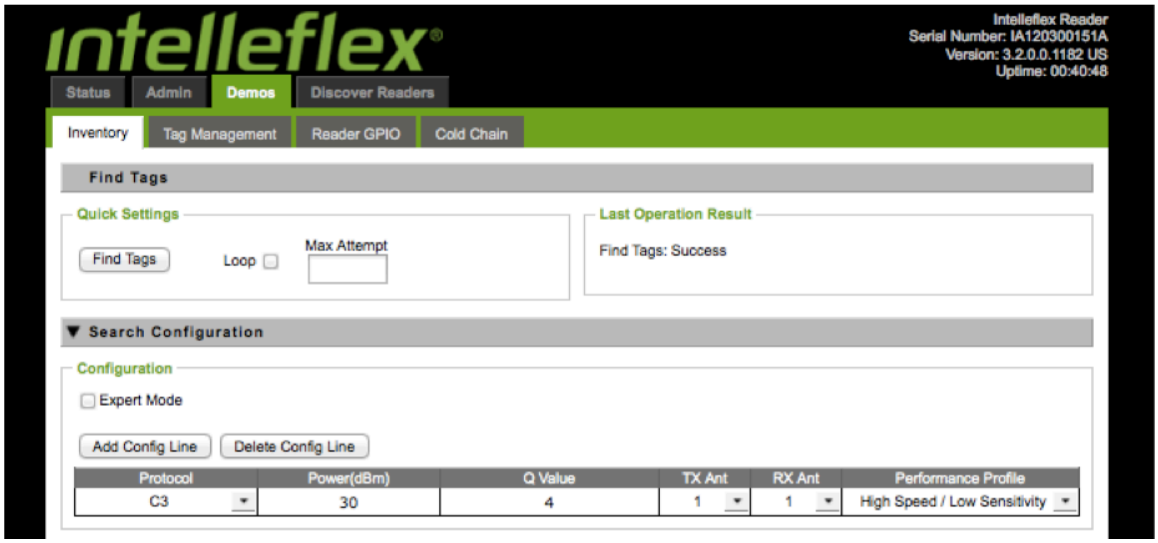


Figure 3.5-1 Inventory and Search Configuration Page

Reader parameters are controlled via “config” lines. A single config line or multiple config lines may be used. A config line is a command sent to the reader telling it what parameters and settings to use during an inventory action. Within each config line, the following reader parameters can be set:

- Protocol – C3 or C1G2
- Power level in dBm, between 0 and +30 dBm
- Q value, between 0 and 13
- Tx and Rx antenna
- Performance Profile

Protocol: Select C3 or C1G2 operation from the Protocol dropdown menu. Two config lines can be used to have the reader read a mixed tag population simultaneously.

Power: Set between 0 and full power of +30 dBm. Use full power to read C3 tags at long range.

Q value: This value defines the number of time slots that are included in a Query. Total time slots = 2^Q. On average having more slots than tags in the field is better than having too few. On a general rule of thumb using twice as many slots as tags works well, with the exception of very large populations of tags.

Tx ant: Select transmit antenna
Rx ant: Select receive antenna

Performance Profile: Changing this value will change the performance of the system; by selecting "High Speed/Low Sensitivity" the system will perform inventories as fast as possible at the expense of read distance. "Medium Speed & Sensitivity" is a middle balance between speed and read distance. "Low Speed / High Sensitivity" is going to perform very slowly relative to the other two, but will maximize read distance and performance in challenging RF environments.

Loop: Check this box for the reader to repeatedly execute the defined set of config lines. Leave it unchecked to execute each defined config line once and only once, before stopping reads.

Search Results

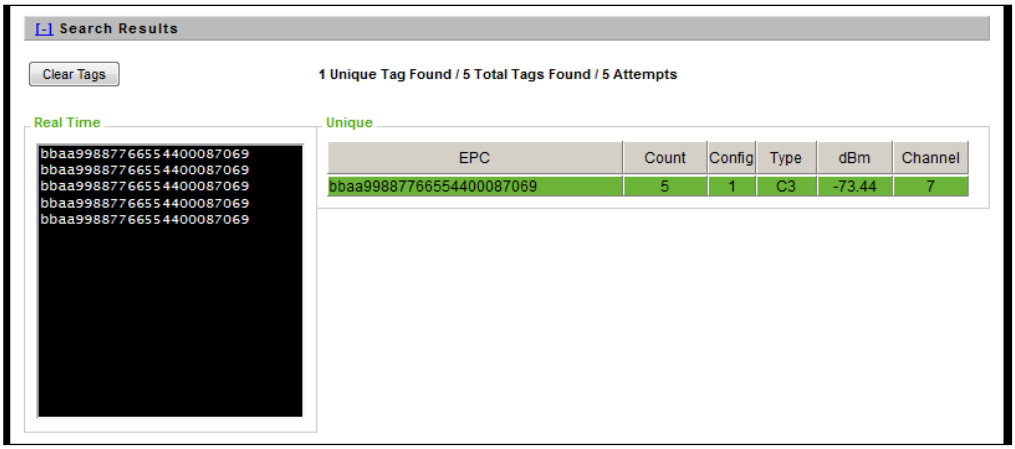


Figure 3.5-2 Search Results with a tag Found

The black window on the left shows the tag ID of each tag, as it is read. Text from this window may be copied into a document, if needed. The window holds the last 100 tag IDs read.

The summary window on the right displays the unique tag IDs of identified tags, number of times that tag was read, the config line that most recently found the tag, the tag type (C3 or C1G2), and the dBm value of the Received Signal Strength Indicator (RSSI). Each field may be sorted by clicking on the corresponding gray header (i.e. to sort by protocol, click "Type").

A summary of reads is also displayed above the unique tag reads window. At the top right corner of the Find Tags window, the Last Operation Result section displays the status of the most current command, giving the user some real time feedback on reader operation.

3.6 Basic Memory Reader and Write Demo

The web based demonstration page includes a simple tag memory management page that allows you to read and write hexadecimal data in and out of the tag memory. Access to the memory is given by “Block” address and an offset. In all Intelleflex XC3 tags there is 60 kilobits of user memory that is broken up into 60 1kbit “Blocks”. To access the “Manage Tag Memory” section on the Demo page, find a tag and double click on the tag in the search results viewing area. The window in Figure 3.6-1 will show after double clicking on the tag.

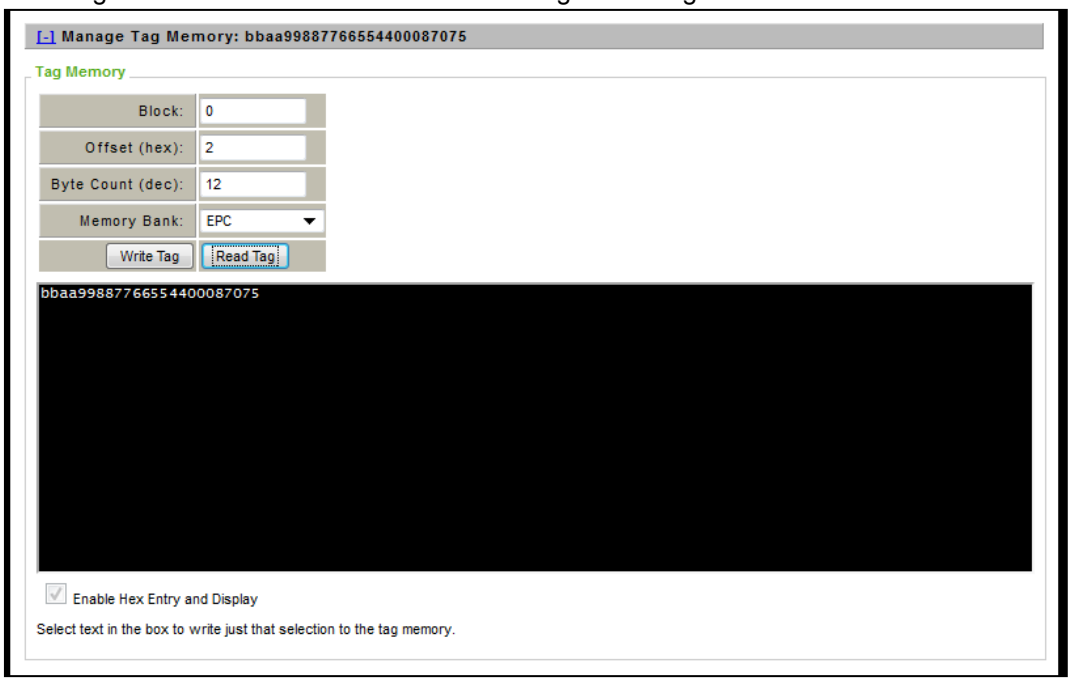


Figure 3.6-1 Tag EPC Read from Tag Memory Management Page

By Selecting the EPC Memory Bank and an Offset of 2 with a length of 12 bytes, the FMR-6000 will read the EPC data that is stored in the tag. All of user memory can also be read and written to in the same way that the EPC memory was accessed here.

3.7 GPIO Testing and Verification Page

The GPIO Testing page enables the FMR-6000 to either set or detect the logic levels of the general-purpose inputs or outputs. See Section 2.3.5 for more information about the General Purpose I/O.

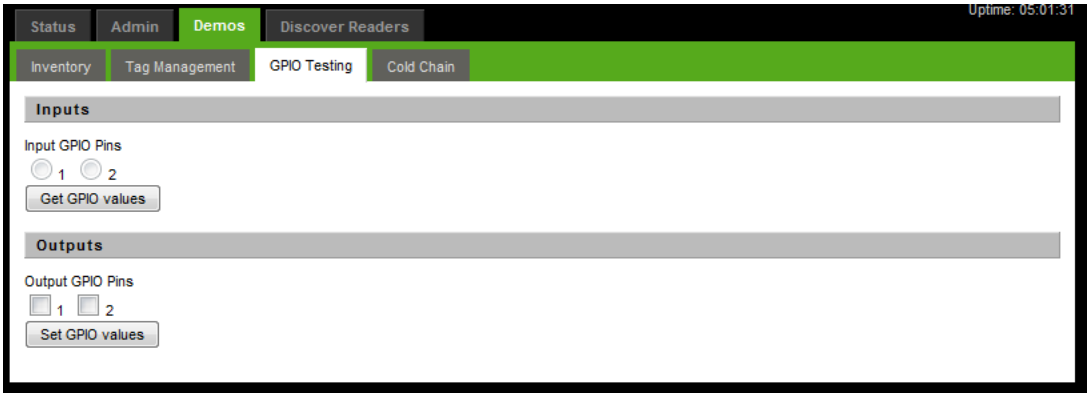


Figure 3.7-1 GPIO Test and Verification Webpage

4. Troubleshooting tips

4.1 Reader is unresponsive over serial port or web UI

- Verify that the power adapter LED is on, the reader Power LED is on, and the reader Fault LED is off.
- If using the serial USB, ensure your terminal settings are correct. See section 2.3.2 and Appendix A.
- If using the reader Web interface, verify your network connectivity. Check reader IP address from the serial USB port to make sure it has a valid IP address. Try to 'ping' the reader from your PC.

4.2 Reader is not reading tags

- Verify that at least one pair of antennas (one Tx and one Rx) are connected and attached to the appropriate ports on the reader.
- From the Demo/test page, verify that that the config line specifies the correct Tx and Rx pair.
- Ensure that the correct config line parameters have been set; to test the reader set the following parameters: protocol (C3 or C1G2), power (set full power at +30 dBm), Q value (set between 4 and 6), select the right Tx and Rx antennas.
- Make sure that the appropriate type of tags are being used for the application. For example, use a mount-on-metal tag for a metal mount application.
- Make sure that you are using the appropriate Performance Profile for your application, if it is not reading the tag in a difficult RF environment, try selecting a slower, yet more RF robust, sensitive profile.

4.3 Reader response is slow or sluggish

- Multiple configuration lines will slow the reader down, Use one configuration line if you want the fastest response.
- Check Q value. For larger tag populations, higher Q should be used. In general, avoid Q values greater than 9. Check to see how many tags are in the readers range. Large numbers of tags take longer to find / inventory.
- Make sure that you are using the appropriate Performance Profile for your application. If it is reading too slowly for your needs, try selecting a less sensitive profile.

4.4 Reader is not able to push data to ZEST over Ethernet

- Make sure the reader and tags are registered on the ZEST Data Services server with correct serial numbers. Refer to the ZEST Data Services User Guide for more information.

- Check the LAN connection for connectivity to the outside world with a PC and try to “ping” dsbeta.intelleflex.com for confirmation of name resolution.

- Check the Network Setup section of the Admin-> Management reader web page for correct DNS settings.

5. Technical Support

For technical assistance, reader service, or repair, please contact Technical Support by filing a support case through our web submittal form

http://www.intelleflex.com/Support.sfdcform.asp

Appendix A Establishing a Serial Connection

A-1 For Windows:

What you will need:

1) Download the appropriate USB drivers located on the Intelleflex website (http://intelleflex.com/Support.Downloads.asp).
2) Use a A-Male to B-Male USB Cable

Once the drivers are installed plug the USB cable into the reader and computer. The drivers should auto install. Open up "Device Manager" in windows.

For XP:

1) Click on **Start** and then **Control Panel**.
2) Click on the **Performance and Maintenance** link. **Note:** If you're viewing the *Classic View* of Control Panel, you won't see this link. Simple double-click on the **System** icon and proceed to Step 4.
3) In the *Performance and Maintenance* window, click on the **System** icon near the bottom of the window.
4) In the *System Properties* window, click on the **Hardware** tab.
5) With the *Hardware* tab selected, click on the **Device Manager** Button.

For Windows 7:

1) Click on **Start** and then type **Device Manager** in the search bar at the bottom.

Once device manager window is open click on **Ports (COM & LPT)** and look for the **USB Serial Port** device as shown in the green box to the right.

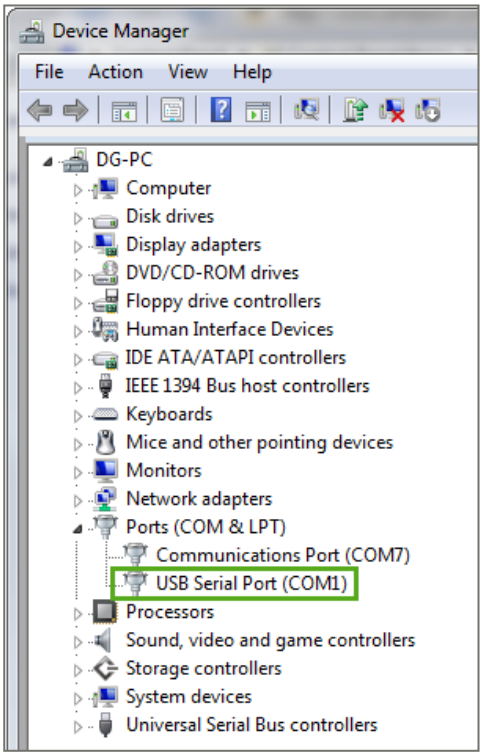


Figure 0-1 Device Manager USB Serial Port COM Port

Open up Tera-Term or HyperTerminal.
For XP:

1) Click on **Start** and then **All Program**
2) Go to **Accessories** -> **Communications -> HyperTerminal**

Windows 7 does not have HyperTerminal Installed, so you can install Tera-Term or any other serial port manager software. Tera-Term can be installed from the Internet.

Once your Serial Device Manager software is open use the following settings to configure the software to talk to the FMR-6000. You have now connected to the FMR-6000 over serial, you can now get system information, set network configurations, or set the reader back to defaults.

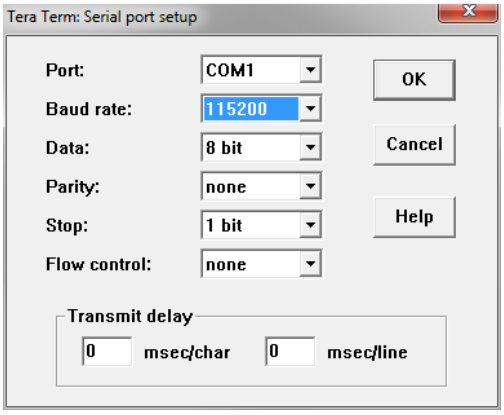


Figure 0-2 Serial Port Baud Rate and other settings

A-2 For OS X (Linux):

Systems for Mac and Linux are very similar, but may not work on every Linux build. The outline below describes using a program called **screen**. If this program is not installed on your system search on the Internet for your specific Linux system and use the appropriate packet manager , “apt-get” for example, and obtain the **screen** program.

Open up a Terminal Window. On OS X this can be found under “Applications” -> “Utilities” -> Terminal. Or hit “Command-Space” and type in “Terminal”.

Once you have a terminal window open, type the following Linux commands. Note that they might be slightly different based upon which version of Linux that is running.

```
user-iMac ~ $ ls /dev/tty.*
/dev/tty.Bluetooth-Modem          /dev/tty.MacPro-Bluetooth-PDA-Sy  /dev/tty.usbserial-A5004bmH
/dev/tty.Bluetooth-PDA-Sync       /dev/tty.SteveReedsiPhone-Wirele
user-iMac ~ $ screen /dev/tty.usbserial-A5004bmH 115200
```

Figure 0-1 Terminal Commands

The first command in black italic font will show all the “tty.” Devices attached to the machine. Look for the device that is label “usbserial-A500…”, it is in green font in Figure 5.2-1. Once the name of the serial device has been identified, look for the second line in black font “screen /dev/tty.usbserial-A500….” with a baud rate setting of 115200.

The FMR-6000 has now been connected over serial providing system information, enabling network configurations, or restoring system defaults.

Appendix B - Cold Chain Web Application

B-1 Introduction

This appendix describes the usage of the cold chain web application on the Intelleflex FMR-6000 reader. It is highly recommended to read the respective User Manual before reading this document. This document assumes some knowledge of the TMT-8500 tag operation. Note: TMT-8500 references any TMT-8500 series tag.

B-2. Tag Functionality

Typical Life Cycle

The typical life cycle of a TMT-8500 tag is best described as a state change environment. The user can change the tags state into four different states:

- Initialized
- Running
- Stopped
- Non Initialized

An additional state called Running with alarms state is not controllable by the user. The tag will put itself into this state if the temperature is outside the configured temperature thresholds. The state changes can be seen in the figure below.

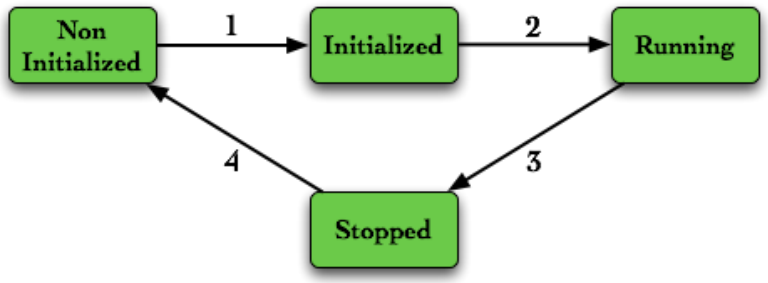


Figure B-2.1 - Application State Diagram

Accessing the TMT tag via the Reader Web Page

Please refer to Section 3 of the FMR–6000 User Manual for information on how to obtain the reader IP Address, checking the reader s/w versions and accessing the web page through a web browser.

Using the TMT-8500

1. On the reader web page, navigate to the Cold Chain Tab as shown in Figure B-2.1.
2. Click on the *FindTag* tab under the cold chain page
3. Select the C3 Protocol and configure other parameters as required. (refer to section 3.5 of the FMR-6000 User Manual)
4. Click on *Find Tags* button. Once your tag appears in the Search Results Window, stop the *FindTags* function and double click on the tag's EPC.

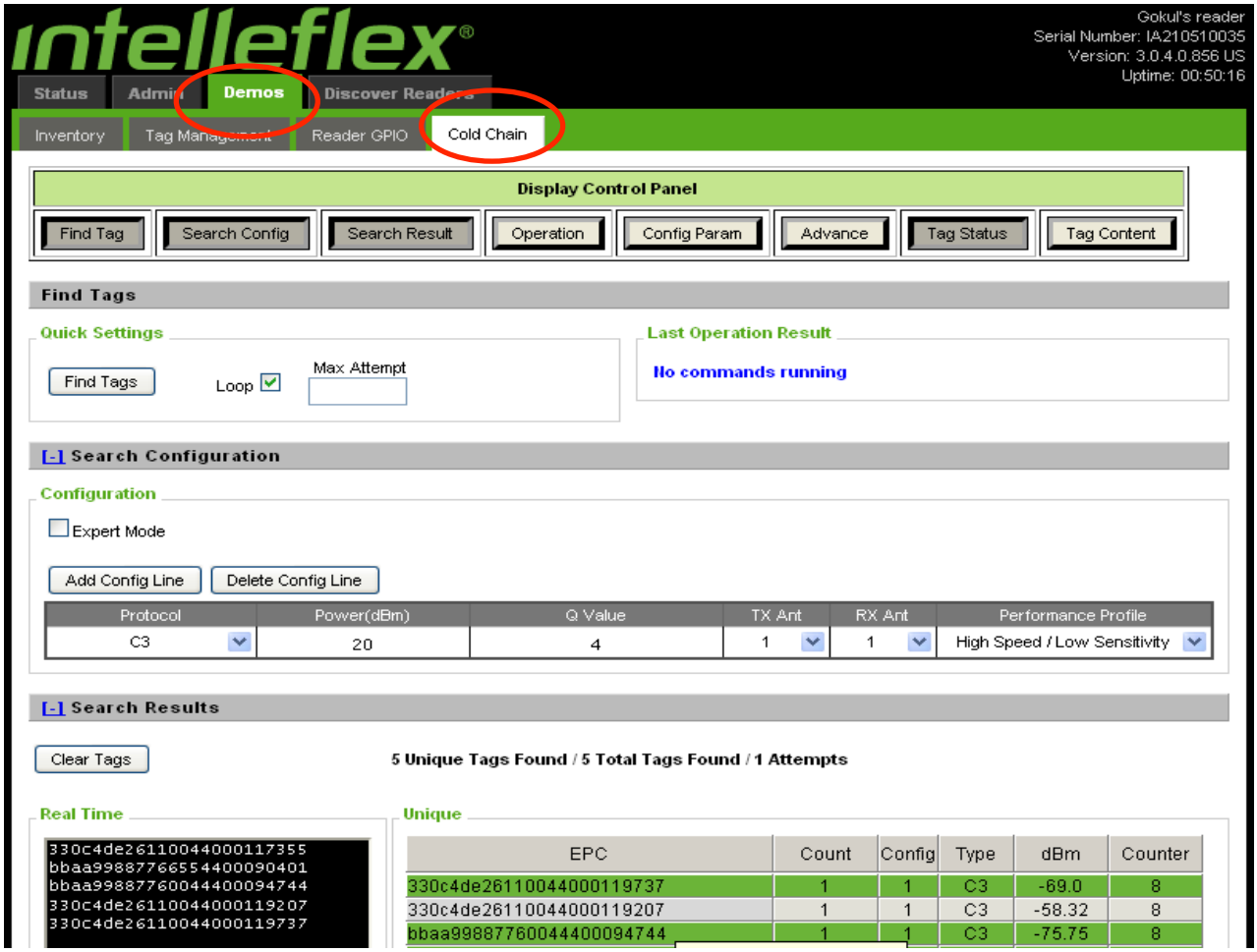


Figure B-2.1 Reader Cold Chain Page

5. If a pop - up window appears saying that the tag is not initialized, click the OK button.

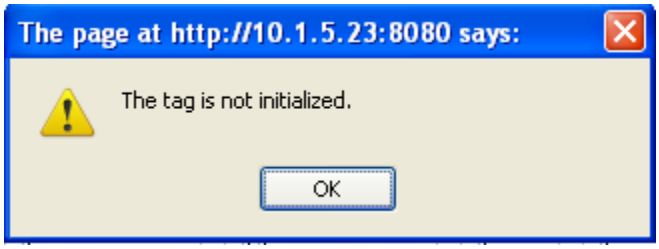


Figure B-2.2 Tag not Initialized

6. Select the *Operation* and *Config Param* tabs shown in Figure B-2.1

7. Scroll down to *BAT Controller Menu.* Here the user can get the current time and current status of the tag. The tag can also be Initialized, Started, Stopped and Reset from this state.

a. To get the current time: Click on *Get Time* button
b. To get current tag status: Click on *Get State* button (0 means Non-Initialized)

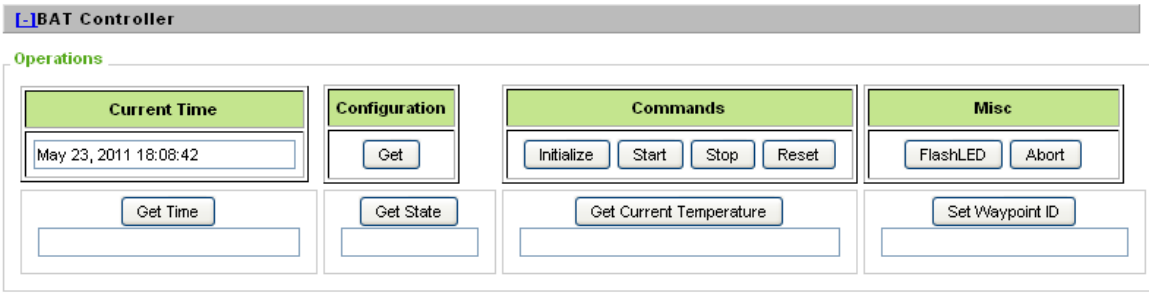


Figure B-2.3 BAT Controller

8. Tag Configuration Parameters

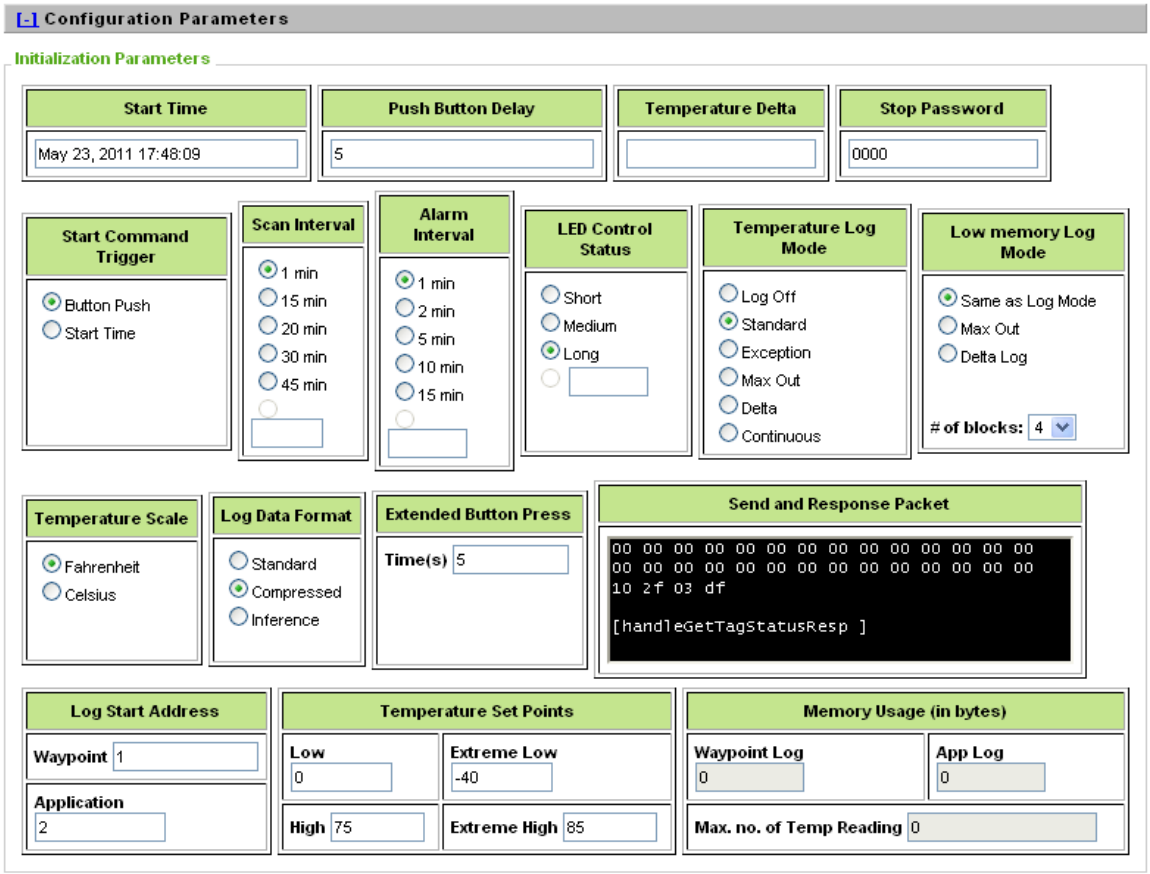


Figure B-2.4 Configuration Parameters

For Basic Temperature Tag Operation select the following parameters:

- Start Command Trigger: User can configure how to start a tag:
  - Button press (default): Press button on tag for more than 7 seconds after initializing the tag
  - Start Time : Enter the time at which you want to start the tag in the start time Box.

  Select the Scan Interval at which you want the tag to log temperature. Select the Alarm interval at which you want the tag to log temperature once the temperature exceeds the specified range.
- Temperature can be logged in different modes in order to cater to different application needs. For normal operation select *Standard Mode* for Temperature Log Mode and *Same as log Mode* for Low Memory Log Mode
- Select a temperature Scale as per you convenience (Fahrenheit or Celsius).
- Log data format determines the way in which the tag stores the temperature data in memory. Select *Standard* for normal operation.
- Extended Button Press determines the amount of time user has to keep the button on the tag pressed in order to start the tag. Set this value to 5 seconds.
- Enter “1” for Waypoint and “2” for Application in the *Log start Address Menu.* These specify the location in memory where the temperature data and waypoint data get stored.
- Set the temperature parameters as per your requirements. Alarms are set in the tag when the temperature detected by the tag exceeds these thresholds.
- Enter 0 for Waypoint Log, App log and Max number of temp reading boxes in the Memory Usage Menu.

9. Click on Initialize button shown in Figure B-2.3 after setting the configure parameters: If a window pops up asking to Continue or stop Script : *Select Continue*
10. Get the current state of the tag. It should be 1, indicating that the tag is initialized and read to start logging temperatures.
11. Click on the *Start* button. This starts the temperature logging function on the tag.
12. To get the temperature readings that the tag has recorded, click on *Tag Content* button shown in figure B-2.1. Scroll down on the page where you can see the menu below

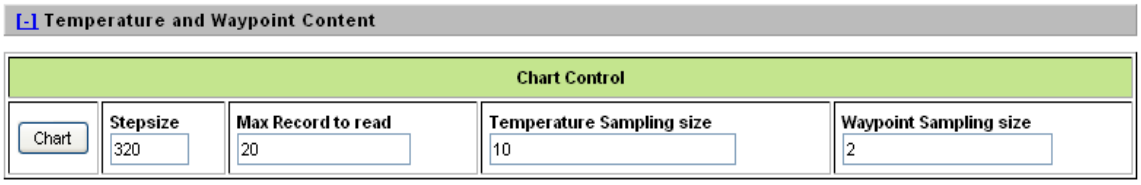


Figure B-2.5 Tag Content

13. Select step size of 320, max records to read as 0, temperature Sampling size = 1 and Waypoint Sampling Size=1. Click on the Chart Button. This will read the entire memory and show all the temperature and waypoint samples logged so far. (Figure B-2.6)

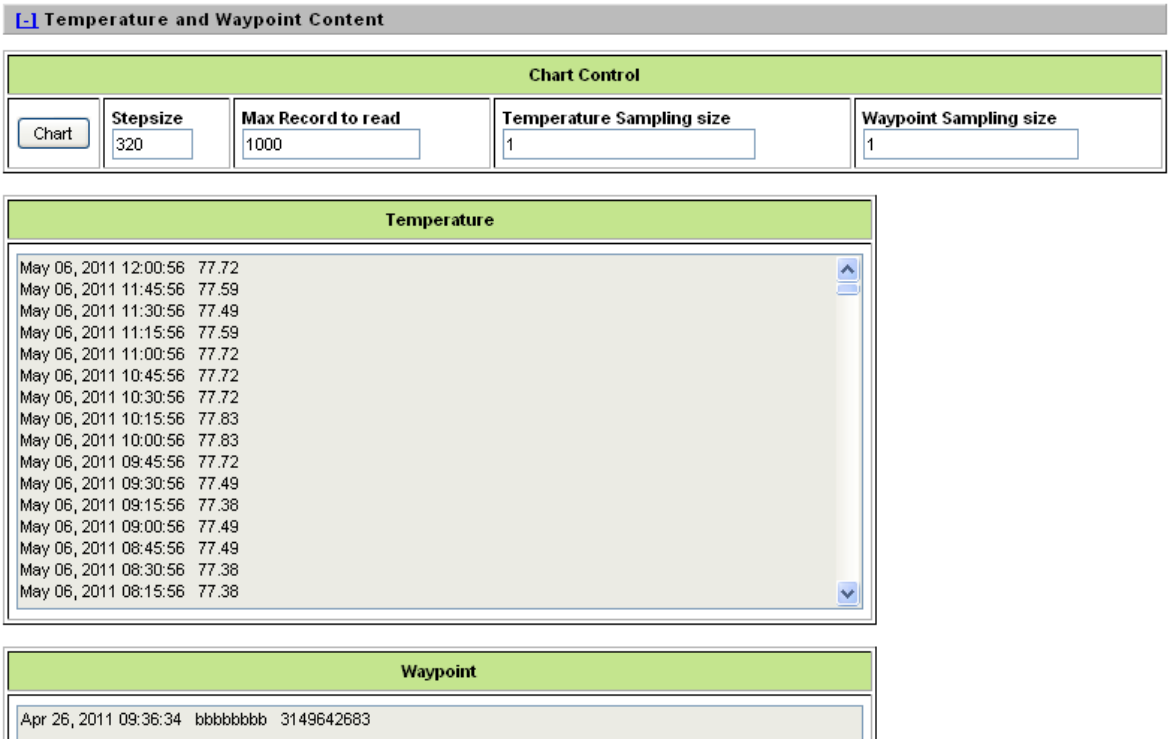


Figure B-2.6 Tag and Waypoint Content

14. It will also show a graph of all temperature readings with time. (Figure B-2.7)

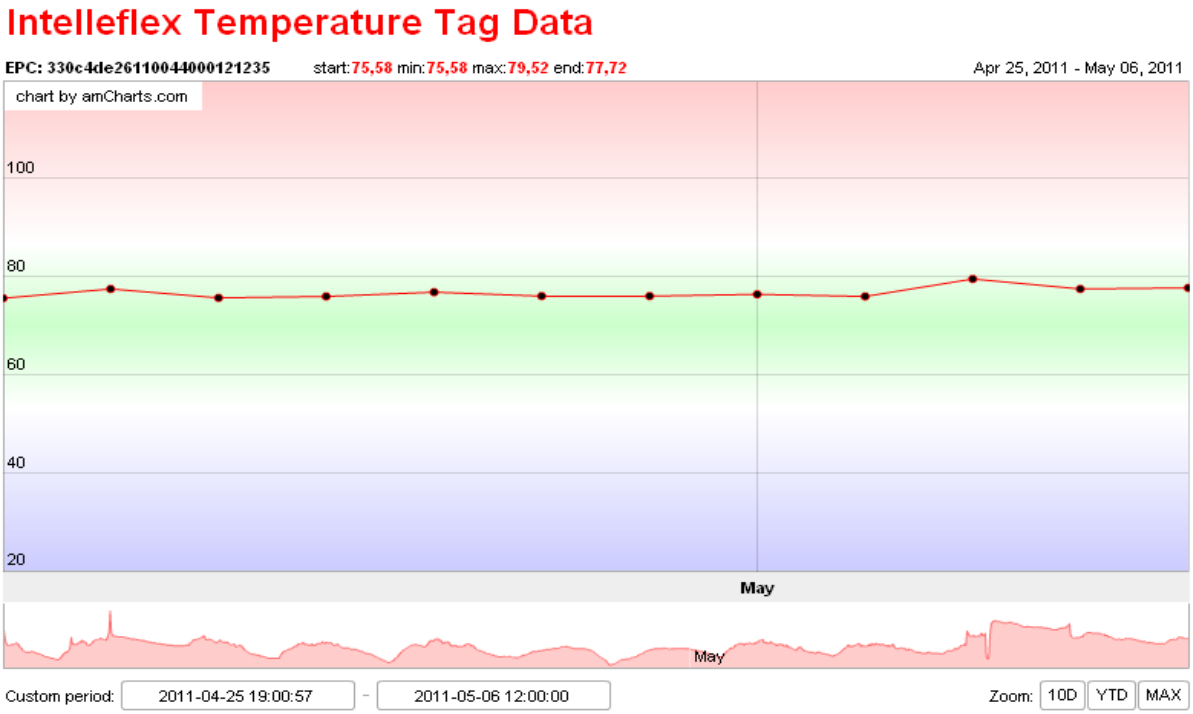


Figure B-2.7 Temperature Chart

15. Get tag state (Figure B-2.3). The tag status could be Logging with no alarms (2) or logging with alarms (3).
16. Select Stop button in Figure B-2.3 to stop the Tag. The tag status changes to 4 when you press the button.
17. To reset the tag and clear all temperature data, click the Reset button shown in figure B-2.3.

Appendix C – Declaration of Conformance

Declaration of Conformity to the R&TTE Directive

Intelleflex Corporation
2465 Augustine Drive, Suite 102
Santa Clara, CA 95054

Declare under our sole responsibility that the product

Product Name:	Intelleflex
Model Number:	FMR-6000-EU
Product Type:	UHF RFID Reader

Conforms to the following Product Specifications

to which this declaration relates is in conformity with the essential requirements and other relevant requirements of the R&TTE Directive (1999/5/EC).
The product is in conformity with the following standards and/or other normative documents:

HEALTH & SAFETY (Art. 3(1)(a)): EN 60950-1: 2006 + A11
EN503085: 2002
EMC (Art. 3(1)(b)): EN 301 489-3 v1.4.1 (2002-08)
EN 301 489-1 v1.8.1 (2008-04)
SPECTRUM (Art. 3(2)): EN302 208-2 v1.3.1 (2010-02)

Limitation of validity (if any): N/A
Supplementary information:
Notified body involved: N/A.....
Technical file held by: N/A

Place and date of issue (of this DoC): Santa Clara CA U.S.A.

Signed by or for the manufacturer: .....
(Signature of authorised person)

Name (in print): .....Russell Shikami.....
Title: .....Vice President, Operations.....