IRiM

Infrared Interface Module

Instruction manual
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1 Introduction

1.1 System Overview

The connected instrument transmits and receives data on an IrDA interface. The Infrared Interface Module (IRIM) allows the user to connect the Instrument to a specific USB printer, serial printer or to a PC using a USB connector. The IRIM is a middleware for translating the IrDA protocol to USB/Serial protocol as per user selection. A PC should be used for receiving the data from IRIM through USB. If a photometer is connected, it transmits test results through the IrDA according to the test method. The IRIM will receive the data through IrDA. IRIM will receive and transmit the data to any one of the following channels as per user’s selection.

- USB Printer
- USB COM Class
- Serial RS232

1.2 Manual Overview

This manual serves as a reference for IRIM users and also for device firmware upgradation. User must have prior knowledge of using windows based applications.

1.3 Keypad Overview

ON/OFF – Switches the unit on and off.
SELECT – Used to switch between the following interface modes (scroll function)
  - USB printer interface
  - Serial printer interface
  - PC interface
RESET – Reset the IRIM board.
  - Used during firmware Upgrade in combination with the ON/OFF button as explained in 4. Device Firmware Upgrade.
1.4 LED Indicators

LED Indications:
- POWER indicator will be illuminated if software is running.
- PC interface indicator will be illuminated if the PC interface mode selected and cable connected with PC.
- USB printer interface indicator will be illuminated if the USB printer interface mode is selected and the cable is connected to printer.
- Serial printer interface indicator will be illuminated if the RS232 printer interface mode is selected. It will not check presence of serial printer.

1.5 Power supply to IRIM

The IRIM gets optional power from two sources:
1. It will first get power from USB device if available
2. If USB device is not available, it will get power from 4xAA batteries.

Only one power source will be active based on the availability. If the software is running the Power LED will be illuminated.

2 IR-connection

IR - connect to the shortest distance possible
3 Start of Application
Infrared data from the instrument will be received by IRIM at 9600 Baud rate.

3.1 USB Printer interface mode
When the unit is switched "ON" it will be in the last selected interface mode.
Initially if USB printer is not connected the interface status LED will be illuminated.
If data arrives while the device is not ready, it will be lost.

3.1.1 Connection to USB printer
Connect the USB printer cable to USB host port next to RS232 DB9 connector. If the printer
is successfully connected and ready to print the LED in front of the USB printer port will
illuminate.

3.1.2 Data transmission
Keep the IRIM and the transmitting instrument (e.g. Photometer) in single line of sight (face
to face). Activate print command in the transmitting instrument. The data will be sent to the
IRIM board and it will be printed on USB printer.
Note: The IRIM software does not support and will not indicate any printer related errors
(Paper jam, paper tray empty, etc).

3.2 Serial interface mode
Press the SELECT key to scroll. The current SELECT functionality will exit and switch over to
serial printer mode.
The LED in front of DB9 connector will illuminate to indicate the serial interface mode.

3.2.1 Connection to serial printer
Connect the serial printer to the DB9 IRIM connector using a straight cable.

Serial straight cable Pin information
Pin 2 is connected to Pin2 of other DB9 connector
Pin 3 is connected to Pin3 of other DB9 connector
GND is common (Pin 5 to Pin 5)

If you want to see the result in HyperTerminal use Cross cable between PC and IRIM board:

![Figure 4 Cross cable](attachment:image.png)
3.2.2 Data transmission

The following settings should be entered in the HyperTerminal:

Start >> Programs >> Accessories >> Communications >> Hyper Terminal

![Figure 5 Setting on HyperTerminal when PC used for receiving](image)

After configuration keep the IRIM and the transmitting instrument in single line of sight (face to face). Activate print command in the transmitting instrument. The data will be sent to the IRIM and will be printed by the serial printer.

Note: If the printer is not connected the data will be lost. Reset the serial printer settings if firmware is changed.

3.3 PC interface mode

Press the SELECT key to scroll. The current functionality will exit and switch over to PC interface mode.

3.3.1 Connection details

Connect the USB cable between the PC and the IRIM device port.
3.3.2 Data transmission

Before the IRIM can be used for the first time the correct driver must be installed. Install the driver delivered with the IRIM.

![Device detection wizard](image)

Figure 6  Device detection wizard

![Driver location](image)

Figure 7  Driver location

A Virtual Com Port under PORT section on device manager will appear.
Launch the HyperTerminal application and select the right Com port as indicated in the device manager and set the following configuration.

![HyperTerminal Configuration](image)

**Figure 9  CDC class settings**

Note: The HyperTerminal resource should be closed before enumeration occurs.

After configuration keep the IRIM and the transmitting instrument in single line of sight (face to face) as close as possible. Activate print command in the transmitting instrument. The data can be seen on the HyperTerminal.

All three interfaces can be connected at power up. The interface can be selected by pressing the SELECT key of the IRIM. On Power up the default mode is the USB printer interface mode.
4 Device Firmware Upgrade (DFU)

4.1 Programming with USB boot loader:

This IRIM board has a pre-programmed USB boot loader located in the "On-chip boot section" of the AT90USB. This is the easiest and fastest way to reprogram the device directly over the USB interface. The “Flip” PC side application, is available from the Atmel website, offers a flexible user friendly interface to reprogram the application over the USB bus.

The “Flip” software is the tool used to upgrade the firmware (available freely in the Atmel website).


The following steps should be completed to allow the device starting DFU mode, and load the hex file:

1. Install Flip software (Flip version 3.0 or above is required)
2. Connect the IRIM board to the PC using the USB cable (Standard A to Mini B)
3. Push the ON/OFF (Hardware Boot loader) key and hold
4. Push the RESET key and hold
5. Release the RESET key
6. Release the ON/OFF key
7. If your hardware conditions explained above are correct, a new device detection wizard will be displayed on the PC. Please follow the instructions as shown below (the INF file is located in the USB sub directory from Flip installation:

   “Install path:\ATMEL\FLIP\FLIPx.x\usb”).
Select the INF file location as
C:\ProgramFiles\ATMEL\FLIP 2.XX\Usb
Check the Device Manager

[Right Click My Computer >> Manage >> System tools >> Device Manager]

You should see the same icon (jungo icon) as shown in the figure below. If not start again from the step 2.

![Device Manager](Figure 12 Device Manager)

Once your device is in DFU mode, launch the FLIP software and follow the instructions explained below:

**Start >> programs >> flip 3.2.2 >>flip3.2.2**

1. Select AT90USB device

![Device Selection](Figure 13 Device Selection)
2. Select the USB as communication mode

![USB communication mode](image1)

Figure 14  USB communication mode

3. Open the communication

![Open the communication](image2)

Figure 15  Open the communication
4. Choose the HEX file to load (the HEX file .a90 / .Hex)

![Image of Load Hex file - Choose file](image16)

**Figure 16 Load Hex file - Choose file**

5. Load the HEX file (Check Erase, Blank Check, Program and Verify, then Push Run button)

![Image of Loading Hex file](image17)

**Figure 17 Loading Hex file**
6. Start the application.

![Start Application]

Figure 18 Start Application

Note: The AT90USB boot loader will detach and jump into the user application when “Start Application” button is pressed.
Note: POWER LED is controlled by software. If software is not downloaded the LED will not be illuminated.
During the boot loader programming mode all LED’s will be in off.

### Table 1 Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>Personal computer/ workstation</td>
</tr>
<tr>
<td>LV</td>
<td>LABVIEW</td>
</tr>
<tr>
<td>USB</td>
<td>Universal serial Bus</td>
</tr>
<tr>
<td>RS232 cable</td>
<td>Serial communication cable</td>
</tr>
<tr>
<td>CDC/ACM</td>
<td>Communication Device Class/ Abstract control model</td>
</tr>
<tr>
<td>IR</td>
<td>Infrared</td>
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<tr>
<td>IRIM</td>
<td>Infrared Interface Module</td>
</tr>
<tr>
<td>DFU</td>
<td>Device Firmware Upgrade</td>
</tr>
<tr>
<td>ISP</td>
<td>In System Programming</td>
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