INDUSTRIAL CONTROL COMMUNICATIONS, INC.

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MIF-47 Quick Start Guide

MIF-47 Product Webpage

http://www.iccdesigns.com/custom-solutions/74-mif-47.html

The product webpage contains links to the latest firmware, product guides, and software.

Check this webpage before upgrading any devices to make sure you have the latest firmware.

Windows Software

MIF Finder

The MIF Finder application allows you to manage the MIF-47 device, including setting the IP address and updating the software.

Download
http://iccdesigns.com/downloads/miffinder/exe/MIF Finder Installer.zip

Remote Access

- SmarTTY
  - http://smartty.sysprogs.com/
  - Allows SSH and SCP access
- PuTTY
  - http://www.putty.org/
- SecureCRT
  - https://www.vandyke.com/products/securecrt/

Manage MIF-47 IP Address

Get the Initial IP Address

1. Connect the development board to your network
2. Apply power to the device.
3. Open the MIF Finder application.

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4. In the “Ethernet” tab, find the device named “MIF-47”.
5. The IP address is listed along with the ICC software version

Set Temporary IP Address

1. Open the MIF Finder application
2. In the “Ethernet” tab, select the device named “MIF-47”
3. Change the IP fields on the left to the new IP address
4. Click “Update IP Settings”
5. Confirm the update by clicking “Update Network Settings”

Set IP Address

1. Open the MIF Finder application
2. Connect USB cable to MIF-47
3. In the “USB” tab, select the device named “MIF-47”
4. Click “Network Settings”
5. Select the interface you want to update
6. Choose DHCP or Static IP from IP Settings dropdown
   a) For static IP: set the IP address, subnet, and gateway if necessary
7. Click “Update”
8. Click “Reboot Device” if prompted to reboot

Connect to MIF-47

Development User

Username: **oem**
password: **icc**

Change the user password by running the **passwd** command on the device. The password is preserved when updating the firmware.

The password will be reset to the default value after performing a system restore.

Console Access

The MIF-47 provides SSH to allow access to the board. The MIF-47 can be accessed over an Ethernet connection or over USB. The MIF-47 supports Ethernet over USB and is configured to be at address 192.168.7.2.

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1. Connect the MIF-47 to your Ethernet network
   a) Alternatively, you can connect the USB cable to the MIF-47 instead
2. Use the methods described above in the MIF Finder application to get the current IP address of the MIF-47
   a) If using the USB method, the address is 192.168.7.2
3. Use an SSH program to connect to the MIF-47 board
   a) Log in as the development user "oem" described above
   b) In Ubuntu (or other Linux) the command is: *ssh oem@192.168.7.2*

Transfer Files

- FTP
  - Access the /mnt/user directory on the MIF-47
  - Log in as the "oem" user with the password you have set
- scp (secure copy)
- USB mass storage
  - Access the /mnt/user directory on the MIF-47
  - File **cannot** be accessed by both the device and the host computer. It is recommended to use **scp** or **sftp** to transfer files that are under development.

Firmware Updates

1. Download the latest firmware from the MIF-47 product webpage
2. Open the MIF Finder Application
3. Find and select your device
4. Click "Upgrade Firmware" on the left
5. Navigate to the software image you downloaded
6. Click Open
7. If prompted to log in to the FTP enter the "oem" user name and password.
8. The device will reset and start the upgrader mode.
9. After several minutes the MIF-47 will complete the software upgrade and reboot. Once the MIF-47 appears in the MIF Finder again, verify the upgrade was successful by checking the "Application Firmware" version.

System Restore

The system can be restored to the last good firmware update by performing a system update. All files in the root file system will be removed and replaced with the restored system files; files in the /mnt/user/ partition (mass storage drive) will be retained.

1. Connect the MIF-47 to an Ethernet network or attach a USB cable to a PC

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2. Open the MIF Finder application
3. Select the MIF-47 device from the list
4. Click the “System Restore” button
5. After several minutes the restore will complete and the MIF-47 will reboot into the refreshed firmware.

MIF-47 Development

Build Toolchain

The build toolchain is provided by the MIF-47 Software Development Kit (SDK). The MIF-47 SDK can be downloaded from the MIF-47 product webpage.

GPIO

Shared ICC Library

- Define a “BOARD_MIF47” macro to get the GPIO pin macros defined in the “iccgpio/iccgpio.h” header file.

SPI

SPI Devices

- /dev/spidev1.0
- /dev/spidev2.0

Documentation

- https://www.kernel.org/doc/Documentation/spi/spi-summary
- https://www.kernel.org/doc/Documentation/spi/spidev

LEDs

There are four LEDs that can be controlled from user space: Module Status red and green; Network Status red and green. The LEDs can be configured to blink based on event triggers (eMMC activity, heartbeat, kernel error, etc) or can be manually toggled by the user. The default states of the LEDs can be overridden by the user by writing to the necessary files in the led class directory (/sys/class/leds/); setting the brightness value of an LED will disable the configured trigger.

Default states:

- Module Status – Green
  - Indicates power on; LED turns off when the kernel has finished shutting down
  - Trigger: none
  - Device path: /sys/class/leds/ModuleStatus:green/

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- Module Status – Red
  - Indicates an error detected in Linux kernel
  - Trigger: kernel panic
  - Device path: /sys/class/leds/ModuleStatus:red/
- Network Status – Green
  - Unused
  - Trigger: none
  - Device path: /sys/class/leds/NetworkStatus:green/
- Network Status – Red
  - Unused
  - Trigger: none
  - Device path: /sys/class/leds/NetworkStatus:red/

Blink LED

Whether an LED is on is determined by the “brightness” file in the LED device’s directory. A value of “0” in the “brightness” file indicates that the LED is off; a non-zero value (ex “1”) indicates that the LED is on.

Here is an example application that turns the NetworkStatus Green LED on and off.

```
#include <stdio.h>
#include <unistd.h>
#include <fcntl.h>

int main()
{
	int	fdBrightness = 0;

	// Control the NetworkStatus - Green LED
	char	*sLedBrightness = "/sys/class/leds/NetworkStatus:green/brightness";


	fdBrightness = open(sLedBrightness, O_WRONLY);

	if (fdBrightness > 0)
	{
		// Turn on the NetworkStatus Green LED
		if (write(fdBrightness, "1", 1) <= 0)
		{
			fprintf(stderr, "Failed to turn on the Network Status Green LED\n");
		}

		// Wait for a second for the LED
		sleep(1);

		// Turn off the NetworkStatus Green LED
		if (write(fdBrightness, "0", 1) <= 0)
```

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```
            {
                  fprintf(stderr, "Failed to turn off the Network Status Green LED\n");
            }

            close(fdBrightness);
      }

      return 0;
}
```

Web Server

The included web server with the MIF-47 is **lighttpd**. The default webpage is */mnt/user/www/default.htm*.

Create a custom web page

- Create an “index.html” file in the */mnt/user/www* folder.
  - The custom web page can also be named “index.htm”
- The next time a user accesses the web page they will see the new, customized page