SOLECTEK SYSTEM	Document Number: SYSFS
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Koito MRS User Guide v1.5

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1. Introduction

For the Phase II release, the Configuration of the MRS boardset can be changed in three ways: HTTP GUI, Telnet and Configuration File.

1. The GUI is functional, though per Solectek schedule, is not completely functional.
2. Telnet may be used to work with the commands listed in this document.
3. The Configuration File may be offloaded, modified and re-stored on the MRS.

2. Unit Power

The MRS boardset is intended to be powered via the 2pin, +48V connector on Minotaur. The Solectek Base Station is to be powered via PoE, supplied by the included Power Supply/Injector and connected into the RJ45 Minotaur connector

3. Unit Access

Both HTTP and Telnet access is password protected. Default access is as follows:

Login: Root
Password: Solectek

4. Unit Defaults

	MRS Boardset	Solectek Base Station
Network Mode	Bridge	Bridge
Ethernet IP Address	172.21.0.100/255.255.0.0	172.21.0.10/255.255.0.0
RF IP Address	192.168.1.x/255.255.255.0	192.168.1.x/255.255.255.0
RF Mode	Client	Access Point
SSID	Koito_2	Koito_2
Encryption	Open	Open
RF Bandwidth	20 MHz	20 MHz

5. Telnet

Any Telnet client can be used to access the MRS and Base Station devices. Access is per login/password above. Once logged in, configuration can be adjusted by two methods: (a) direct commands, or by (b) modifying the configuration file.

5.1. Direct Commands

set_config

The set_config can be used to change (or add) a configuration variable. On in the Telnet shell, the command may be invoked as:

set_config VARIABLE VALUE
eg.
set_config ENET0_IPADDR 10.20.20.7 (Set the ENET0_IPADDR).
set_config DEV_MODE ap (set the device operation mode to AP).

IMPORTANT: All set_config commands should be followed by a ***save_config*** command which stores the changes to permanent Flash memory. A reboot is also required for most command to take effect.

show_config

You may use the show_config command to display the value of a configuration variable.
eg.
show_config ROUTER_TYPE

5.2. Configuration File

Within the MRS software system, there are two files that hold configuration information. Both are accessible by Telnet:

- **/etc/shadow** - has user name and passwords for console and telnet (and ssh) login. (This file does not hold the password for the GUI login)
- **/etc/solectek/CONFIG_VARS** - This file holds all the configuration information for Networking (such as IP addresses, netmasks etc.), WIFI configuration, Product Operation mode etc.

Remember that any method you use to modify these files, require the command save_config when you are done with the changes.

The file CONFIG_VARS contains information on the product configuration. This file has a very simple format:

VARIABLE1=VALUE1
VARIABLE2=VALUE2

Changing the VALUE of a VARIABLE will change them in the current CONFIG_VARS file, but not in the flash.

The file can be changed by: uploading a version of the file to a PC, edit it, and download it back to the device. Save it, and then reboot. There are two methods to accomplish this:

- ftp - ftpput is used to send a file from the MRS device to a remote system. ftpget is used to get a file from a system. The commands look as follows:

  ftpput -u username -p password local-file remote-file
  ftpget -u username -p password local-file remote-file

- http - Can be used only to download a file. The command is:

wget http://ip-address/path-to-file

6. Configuration Parameters

Note: Parameters are case sensitive

Note: Parameter format below is correct for CONFIG_VARS file usage. When used with set_config, the '=' is replaced by a space.

- ENET0_IPADDR=aa.bb.cc.dd - IP address of the Ethernet Interface - Used as the Bridge address when the system is operating in Bridge mode.
- ENET0_NETMASK=aa.bb.cc.dd - Netmask for the interface
- ENET0_BROADCASAT=aa.bb.cc.dd - The broadcast address of the interface
- ENET0_MAC=aa:bb:cc:dd:ee:ff - The mac address (This may go-away based on manufacturing). Currently, when the system boots up, this MAC address is set on the Ethernet Interface.
- WIFI_IPADDR=aa.bb.cc.dd - The WIFI IP address - Can be ignored if the system is a Bridge
- WIFI_NETMASK=aa.bb.cc.dd - Netmask for the interface
- WIFI_BROADCAST=aa.bb.cc.dd - Broadcast address of the interface
- DEFAULT_GATEWAY=aa.bb.cc.dd - The default router gateway
- ESSID - ESSID of the wireless interface - If the device is an AP, then it will advertise the ESSID, while if it is a client, then it will connect to this ESSID
- DEV_MODE=ap|client - The device mode, can either be "ap" or "client"
- ROUTER_TYPE=bridge|router - The routing method can be "bridge" or "router". If bridging is used, then it will use the information of the Ethernet interface and apply it to the bridge interface.
- WIFI_CWMMODE=0|1|2 - 0 = static 20Mhz channel, 1 = dynamic 20/40 Mhz, 2 = 40 Mhz Channel. System must be set to 0.
- WIFI_ENC=open|shared|ieee8021x - open is WEP (static key), shared WPA2 with either a passphrase or passkey (128 bits).
- WIFI_WEP_KEY=key - 10 digit or 26 digit hex key (for 40+24 or 104+24) WEP
- WIFI_PASSPHRASE=pass-phrase - 8 to 32 characters - This is used when WIFI_ENC=shared. If present, this will be used instead of WIFI_PSK (below)

- WIFI_PSK=32 hex digits PSK - Used in shared mode
- RADIUS_SERVER=a.b.c.d - IP address of radius server. Used when WIFI_ENC=ieee8021x.
- RADIUS_SECRET=secret - Secret shared with the radius server
- ADMIN_NAME=admin - For HTTP login request for the GUI
- ADMIN_PASS=password - For the HTTP login
- HTT_AUTH_REQ=on - on or off - When on, secure web-pages require login (with ADMIN_NAME)
- SERIAL_NUM=xxx - This is the serial number of the unit. It should not be changed.
- PRODUCT_NAME=MRS - Product name assigned by Solectek
- OEM_NAME=xxx - Solectek can use this when configuring for an OEM
- SYSTEM_NAME=string - Name to identify the device
- VERSION_files=string - Will be put in when upgrade is done
- VERSION_kernel=string - Will be put in by upgrade process
- ROUTE_NET_0=aa.bb.cc.dd - Static route to be added
- ROUTE_NET_1=aa.bb.cc.dd - Static route to be added
- ROUTE_NET_n=aa.bb.cc.dd - Static route to be added (Max 8 - ROUTE_NET_7)
- ROUTE_GW_n=aa.bb.cc.dd - Gateway for ROUTE_NET_n (0 <='n' <=7)
- ROUTE_NETMASK_n=aa.bb.cc.dd - Netmask for ROUTE_NET_n (0 <='n' <=7)

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7. Upgrading Software, Phase3 SW release

The method described below is a temporary method to upgrade software prior to the user-friendly approach to be delivered in the Phase3 release.

WARNING: updating the MRS and AP software using the following procedure will reset the configuration file. All configuration information will be reset to default, **including the Ethernet MAC address. It is vital that the Ethernet MAC address configured properly, after the upgrade is complete.**

- Prepare Windows XP Service Pak2, server with IP address = 172.21.0.200
- Download TFTP dwin version 0.4.2... from:

http://www.download3k.com/Install-TFTP-Server-TFTPDWIN.html

- Install the TFTPDWIN Server in the directory "C:\program files"
- Copy both the Vmlinux.img and Root.img files into "C:\program files\Tftpdwin\" directory
- Connect ethernet cable between Minotaur and Server.
- Connect serial cable between Minotaur and Server.
- Launch Hyperterm or Teraterm console application and configure the following settings:
    - baud rate = 115200
    - 8 data bits
    - no parity
    - 1 stop bit
    - HW flow control = No
    - SW flow control=No
    - Serial Device = /dev/ttyS0

    Be sure exit and reset "minicom" after changing the settings and allow some time for the serial console to reinitialize.

- Boot Minotaur
- Logon and verify Serial console read and write access. (You should see text scrolling and after booting, you should be able to type into the console)
- At the console prompt, type: *show_config ENET0_MAC* and record the unit's MAC address
- Power cycle Minotaur and immediately press “Ctrl-C” on Console screen. This will stop the boot process and provide access into the Redboot Boot Loader.
- Enter the following commands:

```
ip_address -h 172.21.0.200 -l 172.21.0.100/16

fis delete solconfig
fis delete ramdisk
fis delete zImage

load -b 0x1600000 vmlinux

fis create -b 0x1600000 -l 0x240000 -f 0x50080000 -e 0x800000 -r 0x1600000 zImage

load -r -b 0x800000 root.img

fis create -b 0x800000 -r 0x800000 -l 0x300000 -e 0x800000 -f 0x502c0000 ramdisk
```

fis create -b 0x800000 -l 0x20000 -f 0x505c0000 solconfig

- Power cycle the Minotaur board and verify successful reboot
- Via Serial Console, or Telnet access, set desired system configuration parameters, *including the Ethernet MAC address recorded earlier.*

8. FCC Radio Frequency Interference Statement

FCC ID: KA358MRS1

This device is certified to comply with Part 15 of Federal Communications Commission (FCC) Rules. Operation is subject to the following two conditions:

1. It may not cause harmful interference.
2. It must accept any interference that may cause undesired operation.

Changes or modifications not expressly approved by Solectek could void the user's authority to operate the equipment.

U.S. Government Restricted Rights Legend

The Product is provided with Restricted Rights. Use, duplication, reproduction or disclosure by the Government is subject to restrictions in subdivision (c)(1)(ii) of the Rights in Technical Data and Computer Product clause at 252.227-7013 and in subparagraphs (a) through (d) of the Commercial Product-Restricted Rights Clause at 52.227-19. Contractor/Manufacturer is Solectek, 6370 Nancy Ridge Drive, Suite 109, San Diego, California.

Radio Transmission Notice

This product is a low power (less than 1 Watt), OFDM radio system pre-set to transmit and receive signals in the 5.725 – 5.850 GHz frequency band. This product has been certified by the U.S. Federal Communications Commission for use in the United States of America in that band. Other markings on the unit label shall indicate regulatory compliance in other international areas.

Any prospective user of this product outside the United States of America should, prior to such use, contact the government department or other agency responsible for assigning radio frequencies in the country in which use is proposed to determine whether such department or agency has any objection to operation of the product given current regulatory label markings on said product, and whether there are any other local devices generating signals in that band which might be expected to interfere with the operation of this product.

Solectek shall not be responsible for any operation of this product which is in violation of local law, creates interference harmful to other local devices, or results in a malfunction of this product caused by outside interference.

This device must be professionally installed and used in strict accordance with the manufacturer's instructions. However, there is no guarantee that interference to radio communications will not occur in a particular commercial installation. In case the device does cause harmful interference with an authorized radio service, the user/ operator shall promptly stop operating the device until harmful interference has been limited. Solectek Corporation is not responsible for any radio or television interference caused by unauthorized modification of this device or the substitution or attachment of connecting cables and equipment other than specified by Solectek Corporation. The correction of interference caused by such unauthorized modification, substitution, or attachment will be the responsibility of the user.

Warning:

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter

This equipment has been tested and found comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Revision History

REV	DATE	ECO #	AUTHOR	DESCRIPTION
1.0	14-Sep-07		D. Gell	original

1.1	03-Oct-07		D. Gell	Added SW upgrade section
1.2	08-Nov-07		D. Gell	SW upgrade section modified
1.3	15-Nov-07		P. Palreddy	SW upgrade section modified to use Windows XP and TFTPDWIN server application
1.4	15-Nov-07		D. Gell	Added FCC information
1.5	01-Dec-7		D. Gell	Added reminder that a Redboot based upgrade defaults the configuration file, including resetting the Ethernet MAC address
1.6	19-Dec-07		D. Gell	Added FCC information