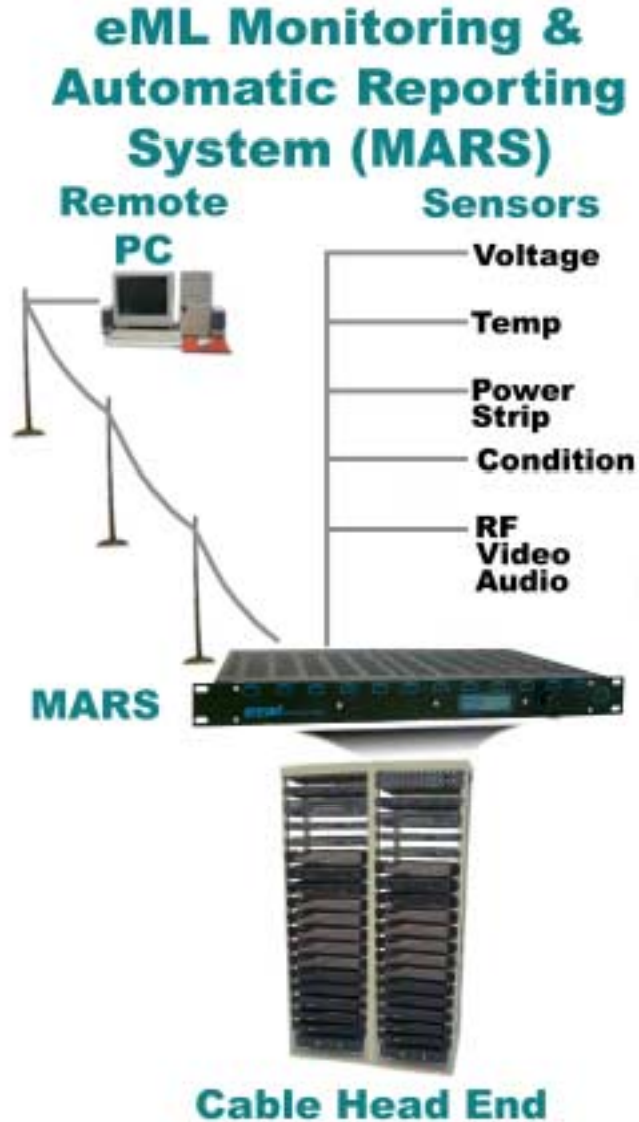


evs/ MARS (Monitor and Control System)

Installation and Operations Manual



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1. PC Software Installation

1.1 System Requirements

- MARS was developed to operate with Windows 98, 2000, ME, XP.
- Pentium-based CPU, minimum. High speed CPU is recommended for faster performance.
- 32 MB minimum, 64 MB or higher recommended for higher performance.
- 2-button mouse.
- Monitor specifications:
Minimum: 15" Monitor @ 1024 x 768, 256 color, normal font size setting.
Recommended: 17" monitor @ 1024 x 768, 256 color, normal font size setting.
Note: If large fonts are set, the complete MARS screen may not be displayed on smaller monitors.
- Network Interface Card, PCI or ISA
(for communication with MARS via TCP/IP protocol)
- *Modem (a hardware modem -- ISA bus modem is recommended for more reliable performance).
- *Analog phone lines (PBX not recommended).

*Note: Modem and phone lines are required only if communication via modem/phone lines is desired.

1.2 Software installation

- Insert MARS CD into CD-DRIVE.
- Close all other window applications currently running on your system.
- Select "**Run**" from the "**Start**" menu and browse the CD for "**setup.exe**".
- Select "**OK**" and follow the instructions within the set-up procedure. Default installation directories are recommended.

NOTE: MARS may contain files that are older than those currently installed on your computer. It is recommended that the newer files be kept.

2. MARS Hardware installation

2.1 Caution information

- When handling the MARS hardware it is recommended that a static strap be worn to prevent damage to components affected by static discharge.

2.2 MARS main module installation

The following installation procedure pre-supposes that the operator has installed an evs/MLC chassis with either an MPS or MPSM-9 power supply.

- **Figure 1** depicts the insertion of the MARS module into an empty bay in an evs1 MLC chassis. The control panel and knob are shown in **Figure 2**. (NOTE: The software version of the control panel must be 3.30 or greater--turning the knob on the MLC chassis displays the version number).
- The MARS main module is shipped with operational software but is not configured or activated by the MARS PC. In this state MARS cannot monitor any functions or communicate with a MARS PC. The PC, however, can connect to and configure the MARS module.

- The MARS module has an LED status indicator (Green/Red) located at the rear of the MARS module beside the RJ11 Phone input (See **Figure 3**). RED indicates that MARS is connected and transferring data to the PC (via TCP/IP or dialup). GREEN indicates that MARS is monitoring functions. There are two LED's on the 10 BaseT input – the GREEN LED indicates a successful connection to the network, the ORANGE LED indicates activity.

NOTE: MARS cannot be accessed from the front panel while the indicator is RED (because communication is in progress with a PC)



Figure 1: MARS module Insertion



Figure 2: MLC Chassis, Control panel and Knob



Figure 3: MARS module rear panel

2.3 MARS external sensor(s)/devices installation

- External devices, such as temperature, voltage and condition sensors, may be rack-mounted on an RP8 rack panel (See **Figure 4**). Alternately they may be mounted on a wall or ceiling using a single module L-bracket as shown in **Figure 5**.
- Up to 8 external temperature sensor modules and 8 voltage sensor modules may be monitored by one MARS module.
- MARS may monitor only 1 external condition sensor. The condition sensor can sense up to 9 logic states.



Figure 4: MARS sensors mounted on RP8 rack panel



Figure 5: L-bracket mount for wall or ceiling

- Up to 8 external addressable power strips (See **Figure 6**) can be controlled by one MARS module. These devices can be mounted directly on a wall, ceiling, etc. or rack-mounted on a 2 RU panel.



Figure 6: MARS APS-8 (Addressable Power Strip)

2.4 Serial (I2C) connection

- Analog TV RF, video and audio and QAM RF functions are sensed internal to the MARS module, with a sample of the combined RF signal being supplied to the MARS via an F-Connector. Sensing of temperatures, voltages and conditions (logic states) is done external to the MARS module and communicated to the MARS monitoring circuitry via a serial I2C¹ bus. Control of Addressable Power Strips and Addressable Switches is accomplished via the same serial I2C bus. (See white cable connections in **Figure 4**). All external devices are connected serially using standard flat, 4-conductor telephone cable and crimped handset plug. The plugs must be assembled such that the wire colors are ordered alike when the plugs are observed in the same view. (See Appendix B for I2C cable assembly instructions.) Connect one of the devices to the MARS module handset jack located on the rear panel. Each external sensing or control device has one or more LED indicators which will illuminate (Green or Red) upon insertion of the handset plug indicating successful connection and the presence of +5 volts I2C bus power.

¹ I2C: Inter-Integrated Circuit (a 2-wire bus specification developed by Philips Semiconductor)

2.5 RF input connection

- Using a standard RG-59/RG-6 cable, connect the combined CATV/QAM RF output to the F-connector located on the rear panel of the MARS module (see **Figure 3**). See **3.2 RF levels** for setting the RF level to the MARS input at the proper level.

2.6 Modem connection

- Connect a standard telephone cable from a wall jack to the RJ11 input of the MARS module (located below the 'Phone' label, see **Figure 3**).

2.7 Ethernet connection

- Connect a Category 5 cable from the 10BaseT input on the MARS module to an available access point (such as a hub, switch or router/gateway) on a Local Area Network (LAN) or Wide Area Network (WAN). Note that a GREEN LED on the 10BaseT input indicates a successful connection to a network. The ORANGE LED on the 10BaseT input indicates activity.

3. MARS Hardware setup

3.1 Setup of sensor and control modules

- The sensor module's address can be set through an access hole located on one side of the module's chassis (See **Figure 7**, below).
- The device address of the temperature and voltage sensor modules must be set for MARS to properly read and configure each module. Devices of the same function set to the same address will produce an I2C bus conflict, thus affecting other MARS operations. Insert a small, flat screwdriver into the slot of the octal selector switch and set devices of the same function to different addresses.



Figure 7: Sensor module showing address selector

- The condition sensor uses the same type of switch to configure the 9th (auxiliary) input (There is only one fixed address for this device). The following options are available:

SW0: Aux input trips on ACTIVE HIGH signal; buzzer is DISABLED
SW1: Aux input trips on ACTIVE LOW signal; buzzer is DISABLED
SW2: Aux input trips on ACTIVE HIGH signal; buzzer is ENABLED
SW3: Aux input trips on ACTIVE LOW signal; buzzer is ENABLED
SW4: Aux input trips on ACTIVE HIGH; buzzer is DISABLED; Faults are LATCHED
SW5: Aux input trips on ACTIVE LOW signal; buzzer is DISABLED; Faults are LATCHED
SW6: Aux input trips on ACTIVE HIGH signal; buzzer is ENABLED; Faults are LATCHED
SW7: Aux input trips on ACTIVE LOW signal; buzzer is ENABLED; Faults are LATCHED

3.2 RF levels

- The RF input should ideally be equal (flat within +/- 3dB) for all analog TV channels. The nominal level can be from +10 dBmV to +25 dBmV per carrier with an ideal range of about +15 dBmV +/- 3dB. QAM RF levels are typically about 7 to 10 dB lower than analog TV RF levels and the MARS is designed to handle QAM signals at these levels relative to the analog channels.

NOTE: Large RF level deviations from nominal will produce inconsistent alarm conditions. Ensure that the RF levels of all channels are within +/- 3dB of nominal at the MARS RF Input.

3.3 Configuring MARS

The operator may choose to configure MARS functions from either the eML MLC control panel or from a remote PC equipped with the MARS Master software.

3.3.1 Configuring MARS Functions from the control panel

The MARS control panel enables you to automatically detect the presence of operating functions (with the exception of QAM) at the MARS site. Once this configuration is detected, it can be sent to the PC, thereby avoiding the manual entry of this configuration at the PC (although manual entry at the PC is still an option). See **4.8.3 Enabling Auto-configuration from MARS to PC** for instructions on how to update the PC with the MARS configuration following an auto-detect from the front control panel.

Note: The auto-detection from the front control panel configures operating functions only. Further configuration settings are required at the MARS site and on the MARS PC's in order for the system to become fully operational.

Note: operation of any module in the MLC (Modular Line Chassis) is accomplished by: 1. **Rotating** the MLC control knob to highlight a selection or adjust a parameter, then 2. **Pushing** the MLC control knob to "select" or "store" it.

To configure the MARS functions using auto-detect:

- Select the bay in which MARS is inserted (the bay number is marked on the front of the chassis).
- Select "Channels/Det CATV" for MARS to detect all valid CATV channels. A message will appear on the control panel LCD informing the operator that channels are being detected (push the control knob at any time to stop auto-

detection). After completing the process, MARS displays the status of detected channels (hi-lighted) over several screens. Turn the knob to view subsequent screens. Push the control knob to exit the "View screen". Select "Go Back" to return to the previous menu. The channel status can be viewed at any time by selecting "Channels/CATV".

- Select "Channels/QAM" to view configured QAM channels. QAM channels can be viewed via the MLC control panel, but cannot be automatically detected via the MLC control panel. They must be configured from the MARS PC.

NOTE: A channel will not be configured as part of the auto-detect configuration if any one of RF, video or audio is absent. The channel can, however, be entered (configured) from a PC operating the Master Software.

- Select "Temp/Detect" to detect all valid temperature modules. A momentary lapse will take place prior to displaying the temperature status results. Rotating the control knob selects the next detected temperature module (hi-lighted). The current temperature and temperature trip value for each detected temperature module can be read at the bottom of the screen. Push the control knob to exit the "View screen". Select "Go Back" to return to the previous menu. The temperature status can be viewed at any time by selecting "Temp/View".
- Select "Voltage/Detect" to detect all valid voltage modules. A momentary lapse will take place prior to displaying the voltage status results. Rotating the control knob selects the next detected voltage module (hi-lighted). The current status of each module is displayed at the bottom of the screen. "On" indicates that the main or auxiliary function is detected and operating. "Off" indicates that the main or auxiliary function is detected, but the voltage is removed from that sensor. "---" indicates that the main or auxiliary function is not detected. Push the control knob to exit the "View screen". Select "Go Back" to return to the previous menu. The voltage status can be viewed at any time by selecting "Voltage/View".

NOTE: AC/DC voltage must be available at the Voltage Sensor for MARS to detect the modules (See Appendix C, Specifications, for voltage range).

- Select "Cond'n/Detect" for MARS to detect valid inputs to the condition sensor. A momentary lapse will take place prior to displaying the condition status results. Rotating the knob selects the next input and displays the alarm status (hi-lighted). The status of the selected input is "True" if the input is valid and "False" if invalid. The auxiliary input is viewed as a separate entity at the bottom of the screen. It will display "---" if not detected. Push the control knob to exit the "View screen". Select "Go Back" to return to the previous menu. The condition sensor status can be viewed at any time by selecting "Cond'n/View".

NOTE: A valid logic-level input must be present for MARS to detect the condition module inputs.

3.3.2 Configuring MARS from the PC

- To configure MARS from the PC, select "SYSTEM" from the MLC control panel and ensure that MARS is "ENABLED". Proceed to item **3.4 Configuring MARS TCP/IP Communication Parameters**.

3.4 Configuring MARS TCP/IP Communication Parameters

The MARS needs to be assigned an IP Address and port number before it can communicate. The MARS is shipped with a default IP address of 192.168.1.253 and a default port number of 21. The IP address and port number can be set or changed via the front control panel on the MARS itself, or, optionally, from the PC once the MARS PC software is installed (See **4.8 Advanced Features and Settings**).

To set the IP address and port number from the front control panel, rotate the MLC control knob to view the menu, then select the bay that the MARS module is installed in. Select "System" then "TCP/IP". The IP address and port number will be displayed. To change the IP address, press the knob to highlight the first digit in the IP address, rotate the knob to change the value, then press the knob to set the value. (Note: all numbers less than three digits need to be padded with zero's to make three digits. For example, the number 65 must be entered as 065 and the number 5 must be entered as 005). When the knob is pressed, the next digit in the IP address will be highlighted. Repeat the process with the remaining digits in the IP address. When the knob is pressed to set the last digit, the display will show the message "SAVING..." at the top. Wait until this message disappears. When the message disappears, the setting has taken effect.

4. PC Software setup

PC software must be configured in order to communicate with a MARS site. Follow the subsequent procedures for PC software setup.

4.1 Setting Options

- A minimal options configuration is required before the PC can communicate with MARS. Start the MARS application on the PC. The MARS Diagnostic Utility (MDU) screen will appear (See **Figure 8**, below). Select "Options..." from the Tools menu on the MDU screen. The Options Form will appear (See **Figure 9**, below)
- Under the "General" tab browse the default database path required to open the database.
- If modem communication is to be used,
 - Under the "Modem Settings" tab click the radio button under "Port" that associates with your computer's modem port setting.

- Since all other features under the "General" and "Modem Settings" tab are optional, select "Save" to store the current options configuration. Keep the options form open and proceed to **4.2 Entering Password Information**, below.

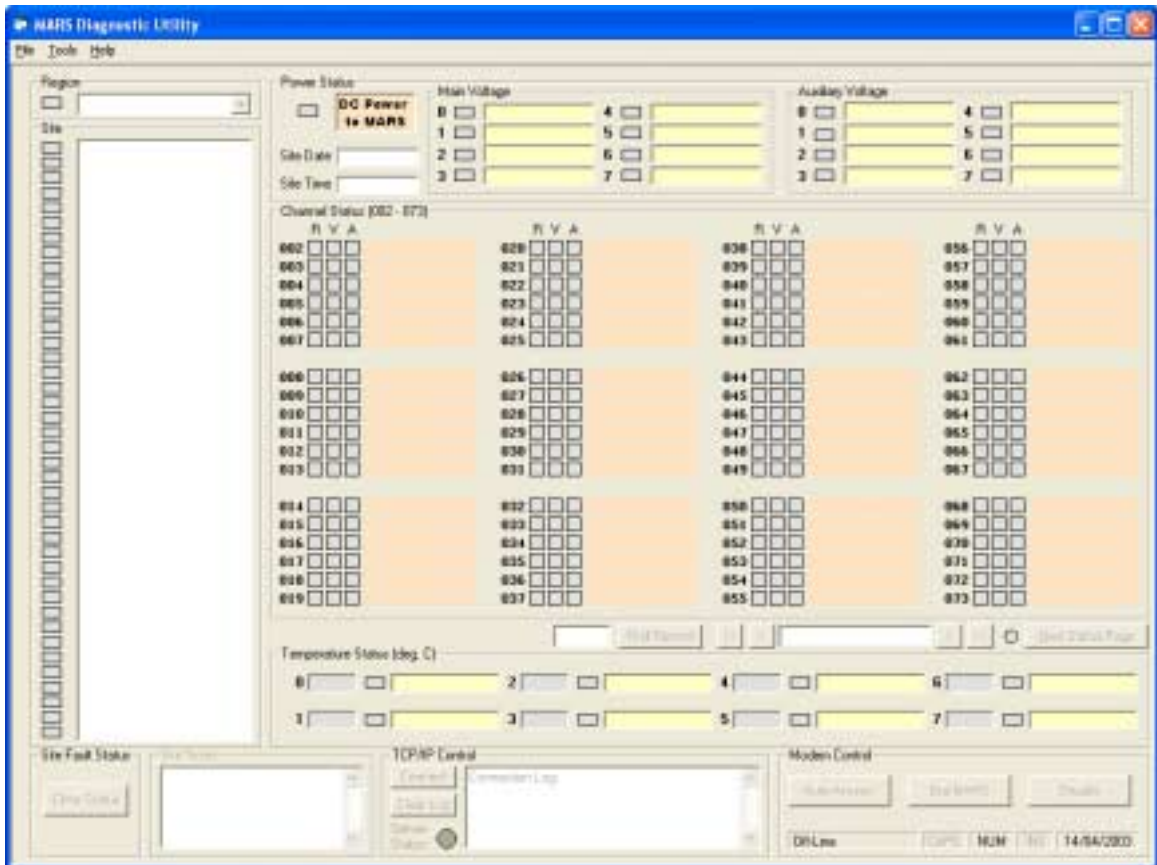


Figure 8: MARS Diagnostic Utility (MDU) main screen



Figure 9: Options Form, General Tab

4.2 Entering Password information

- Passwords are required to access various features of the MARS. The ‘user’ and ‘administrator’ passwords control access to the MARS application on the PC while the TCP/IP username and password control access the remote MARS site(s). More specifically, the ‘user’ password allows access to the MARS database on the PC and, in combination with the TCP/IP username and password, allows the monitoring of the MARS site and ‘cycling’ of power strips on site. The ‘administrator’ password allows full access to the configuration of the MARS application on the PC and, in combination with the TCP/IP username and password, allows the monitoring and full configuration of the MARS site.
- Before MARS operations can begin, new passwords must be entered.

Note: Alpha characters ARE NOT case sensitive for the user and administration password. However, they ARE case sensitive for the TCP/IP username and password.

- To enter a new password, there must be either a current, valid password or the password must be cleared. If valid password currently exists, then skip the instructions on clearing the passwords that follow.
- To clear the password(s), ensure the database is closed (If the database is not closed, then close the database by selecting “Close Data Base” from the File menu), then select “Tools/Password Administration” from the MDU screen. After the Password Administration window appears (See **Figure 10**, below), enter the product ID and click “Submit” to enable the check boxes for clearing password(s). Check the boxes according to what you wish to clear, and then select “OK”. The password(s) will be cleared after selecting “Yes” to the subsequent dialogues. Note: clearing the TCP/IP Username/Password clears the username and password at the PC only – it does not clear the username and password at the MARS.

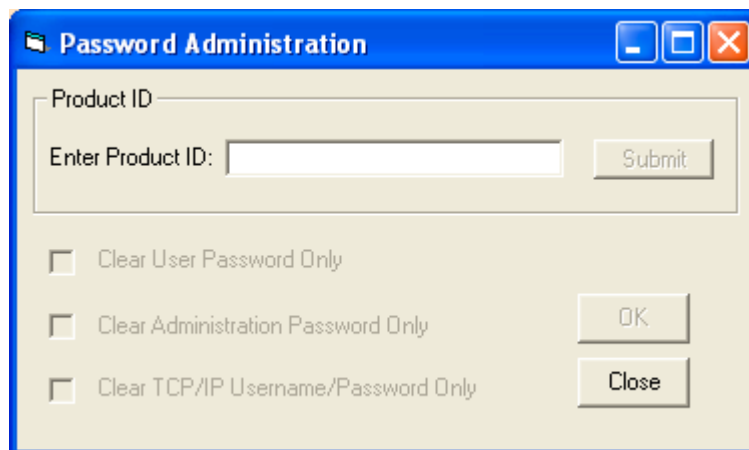


Figure 10: Password Administration Form

- To enter passwords for the MARS application:
On the Options form, select “MARS Security” (See **Figure 11**, below).



Figure 11: Options Form, MARS Security Tab

If passwords have been cleared in the previous step above:

For each password or username, leave “Old Password” blank and enter in the “New Password” and “Confirm Password” with a minimum of four and a maximum of 10 alphanumeric characters. Click “Save” and then click “Yes” to save the new password.

If passwords have not been cleared and existing passwords are known:

For each password or username, enter in the “Old Password”, “New Password” and “Confirm Password” with a minimum of four and a maximum of 10 alphanumeric characters. Click “Save” and then click “Yes” to save the new password.

- After entering the password(s), select “Close” to close the Options form.

4.3 Opening the Database

- After the user password is configured and the default database path is set in the "Options" form, the operator can open the database.
- From the main MDU screen, select "Open Database" or select a recent file from the “File” drop down menu.
- Enter the USER or ADMINISTRATOR password and press "ENTER" or select "OK".
- If “Open Database” was selected, browse to the location of the database, select the file, then select “Open”.
- The name of the opened file will be appended to the "MARS Diagnostic Utility" title bar located on the top of the MDU screen. If the database contains status information, the screen will display status information, otherwise the screen will be blank.

4.4 Creating a Site

- Prior to configuring a MARS Site, there must be at least one Region created. Select "DataBase Manager/Region Manager" from the Tools menu. Enter the ADMINISTRATOR password and press ENTER or select "OK". When the Region

Manager window appears(See **Figure 12**, below), enter a region name and click "Add". Select "Close" to exit the Region Manager.

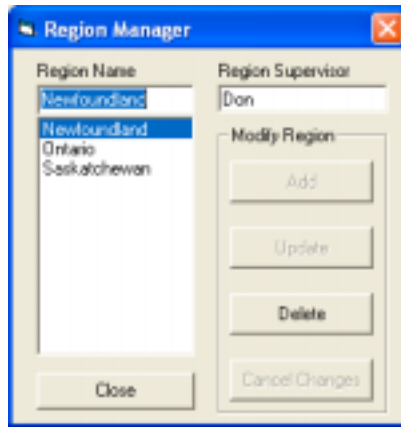


Figure 12: Region Manager Form

- Select "DataBase Manager/Site Manager" from the Tools menu. Enter the ADMINISTRATOR password and press ENTER or select "OK". When the Site Manager window appears (See **Figure 13**, below), enter a Site name and select an associated region from the Region List.

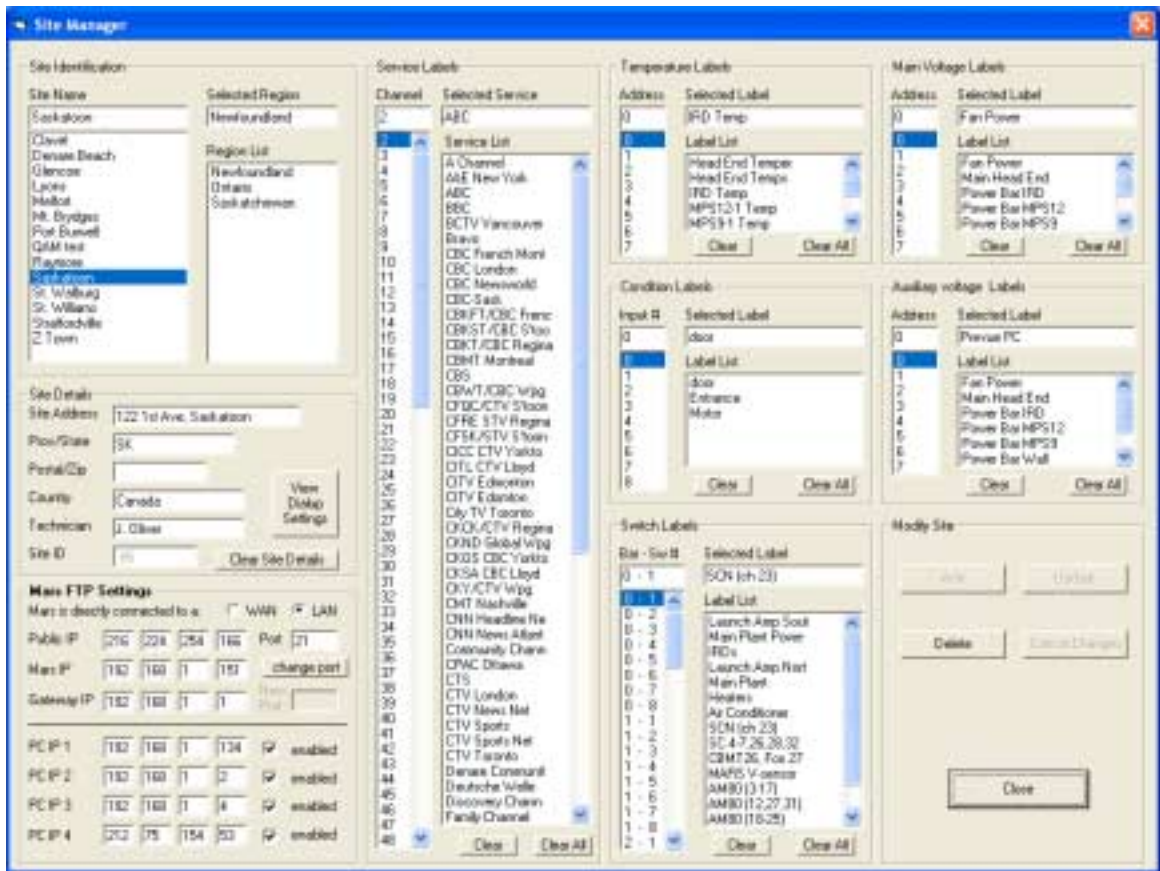


Figure 13: Site Manager Form

- If modem communication is to be used:
 - Click on the “View Dialup Settings” button to display the dialup configuration information (See **Figure 14**, below.). Enter a Site Phone number for the MARS site.

Phone number have no formatting--whatever is entered will be dialed. A maximum of 30 numeric digits can be entered including commas; each comma results in a 2-second delay (for example, can be useful for dialing 9). This Site Phone number is all that is required to contact the MARS site. However, if the MARS site is to automatically report faults to one or more PC's (up to four PC's can be reported to), enter in the phone number(s) and check the "enabled" checkbox for each PC. Note: A PC that is not listed in the spaces provided can still contact the MARS. The spaces are provided so that the MARS will automatically contact the listed PC's in the event of a fault.

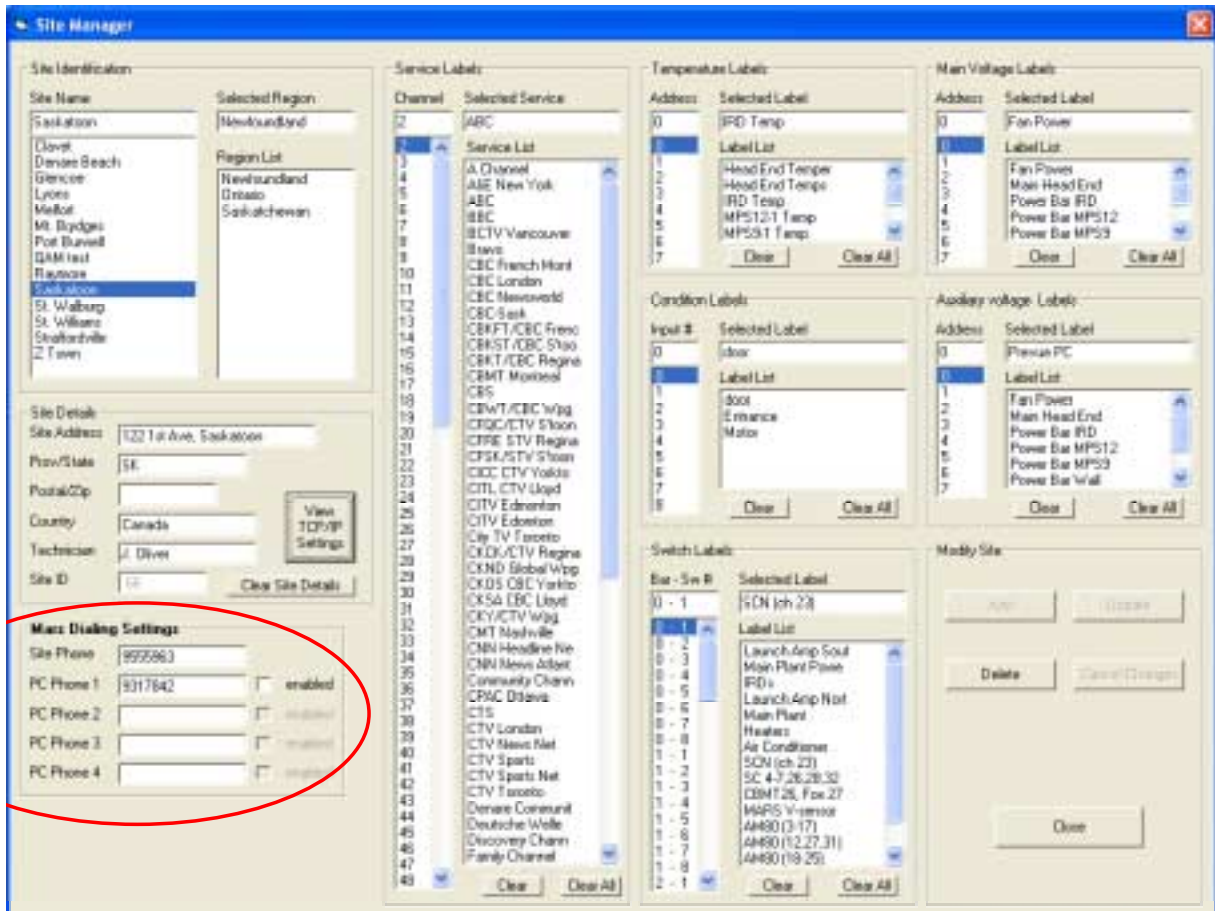


Figure 14: Site Manager Form

- If TCP/IP communication is to be used:
 - If the TCP/IP settings are not visible, click on the "View TCP/IP Settings" Button located on the Site Manager Form. Click on the "LAN" or "WAN" radio button depending on whether the MARS is installed on a LAN or a WAN.
 - Enter the Public IP address beside the "Public IP" label. This is the IP address that is required to reach the MARS. Enter the MARS IP address beside the "MARS IP" label. This is the IP address on the MARS module itself. This may be the same as the Public IP that was specified beside the "Public IP" label.
 - Enter the Gateway IP. This is the IP address of the gateway or router that the MARS needs to communicate with in order to reach any Public IP address. The

MARS module itself is shipped with a default gateway of 192.168.1.1. If the gateway entered at the PC is different than this default gateway, the gateway at the MARS site will be updated on the next communication with the MARS site.

- Enter the Port number that the MARS module is set to. Unless this has been changed at the MARS since initial installation, the port number that should be entered will be 21. To change the port see **4.8.1 Changing MARS Port from PC** which can be found under the section **4.8 Advanced Settings**.
- If the MARS is to report faults to any PC's, enter the IP addresses for up to 4 PC's in the space provided. Click on the check box beside each PC IP address in order to enable communication to that PC. Note: All of the PC's listed must be set to the same port. Further configuration is required for each PC once the Site Manager form is closed.
- Select "Add" then "Close" to exit the site manager.
- The Region Name and the Site within that region now appear on the main screen.

4.4.1 Automatic Communication from MARS to PC on Fault/Restoration:

In order for the MARS to automatically report faults to a PC listed on the Site Manager Form, the listed PC must be configured to accept communication from the MARS site. Select "Internet Configuration" from the Tools menu on the main MDU screen to view the default settings (See **Figure 15**, below).

The screenshot shows a window titled "Internet Configuration - TCP/IP Server and Email". It contains several configuration sections:

- Server Status:** "Server Running" (dropdown), "Number of Current Connections: 0" (spin box), and an empty "Currently Connected:" list box.
- TCP/IP Server Configuration:** "FTP Server IP" (192.168.1.167), "Server Port" (21), and "Maximum Connections" (10). Buttons: "Save TCP/IP Config", "Cancel Changes".
- Email Configuration:** "Email Communication" (checked, "(select to enable)"), "SMTP Server", "SMTP Port", "Sender email", and four "Recipient" fields (1-4). Buttons: "Save email Config", "Cancel Changes".
- Log:** "TCP/IP Server Log (2/1/05/2000 2:50:25 PM) Server started".
- Bottom:** "Hide" and "Clear Log" buttons.

Figure 15: Internet Configuration Form

By default, the PC accepts communication from the MARS site on Port 21. If you wish to change any of the default settings, refer to **4.8 Advanced Features and Settings**.

The Internet configuration form also includes an email configuration section that will allow you to automatically notify up to four recipients by email in the case of a fault from the Mars. After entering email settings, ensure that the Email Communication checkbox is selected so that email is enabled. Select “Save email config’ to save settings. Select the “Hide” Button, to return to the main MDU screen.

4.5 Configuring the Site

- Once a Region and Site have been created open the configuration window to enter the basic information required to configure a MARS Site.
- Select "Tools/MARS Configuration" from the tool bar. Enter the ADMINISTRATOR password and press ENTER or select "OK". The MARS configuration window appears (See **Figure 16**, below).

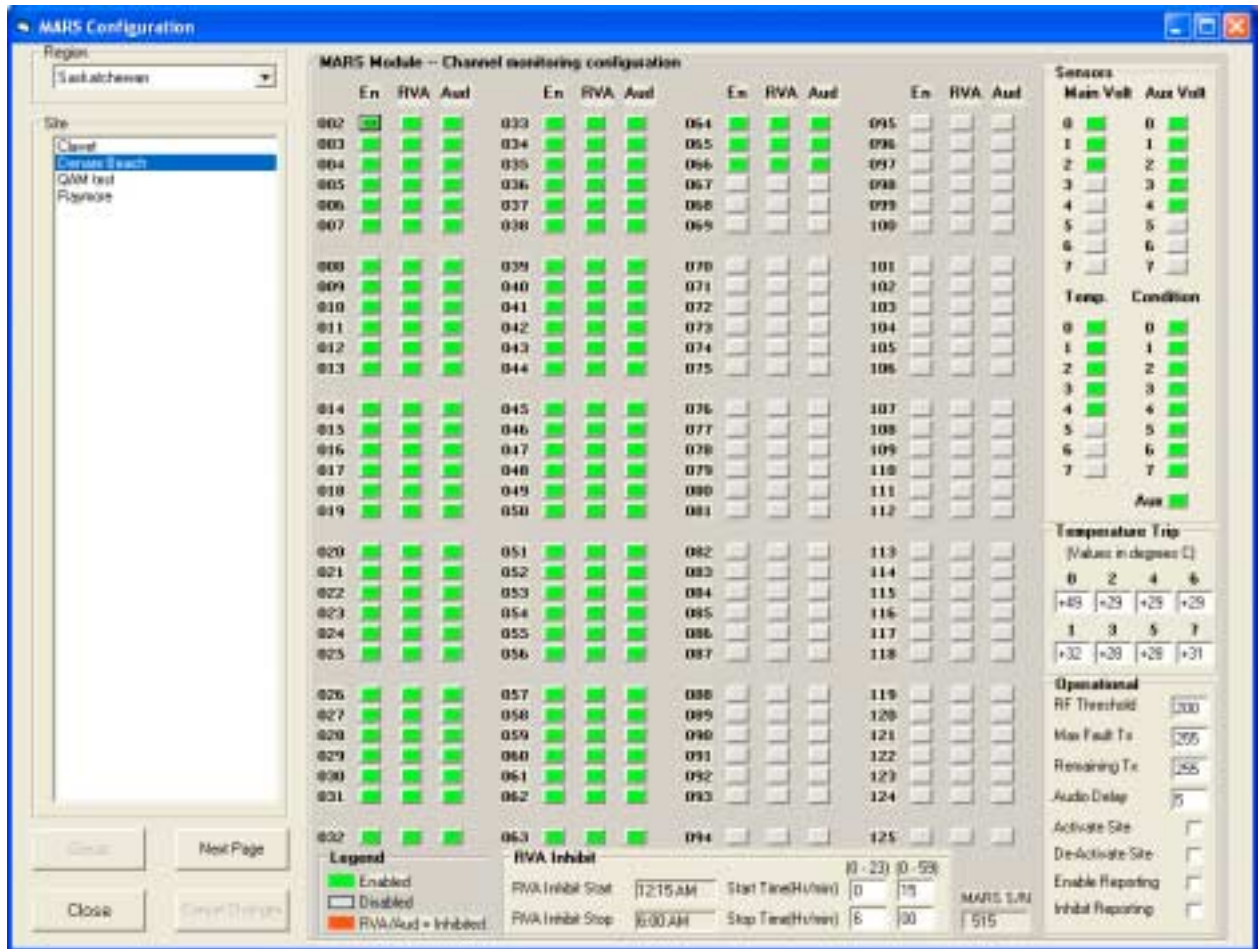


Figure 16: MARS Configuration, Channel Monitoring Configuration Screen

- Select the Region and Site you wish to configure. If the MARS site was previously configured as discussed section **3.3.1 Configuring MARS from the control panel** (allowing MARS to auto-detect the presence of functions) then skip steps 1, 2, and 11, below. If the MARS site was not previously configured, perform all of the steps below:
 1. In the "MARS module--Channel monitoring configuration" frame, select the CATV channels that MARS should monitor by clicking on the "En" box beside each channel. The function of the next two boxes (RVA and Aud) is not required for minimal setup.
 2. In the "Sensors" frame, select the voltage and temperature modules and condition inputs that MARS should monitor by clicking the boxes beside each number. The numbers beside the boxes represent the selected address of each voltage and temperature module (discussed earlier in **3.1 Setup of sensor modules**). Each number beside each box of the condition sensor represents a single input.
 3. Enter the temperature trip points a few degrees higher than the anticipated normal operating temperature of each temperature module.
 4. Enter "200" in the "RF Threshold" text box. (200 is a "level" that would equate to an RF input of about +15 dBmV). A fault will be detected when then RF-level drops approximately 10 dB. See **Appendix A** for a calibration graph of values.
 5. Enter a number in the range of 2 to 255, inclusive into the "Max Fault Tx" text box. When MARS has reached the Maximum number of faults or restorations indicated in the text box, the PC will instruct the MARS to inhibit further calls for the remainder of the day. MARS will reset this status at midnight. This is useful if you want to limit the number of fault and restoration reports in a day.
 6. Enter number between 1 and 6, inclusive for the "Audio Delay". With lower numbers MARS will be more sensitive to intermittent audio lapses. If the MARS site does not detect the presence of audio within the number of seconds specified, it will report a fault.
 7. Click "Next Page" to advance to the QAM configuration screen (See **Figure 17, below**).

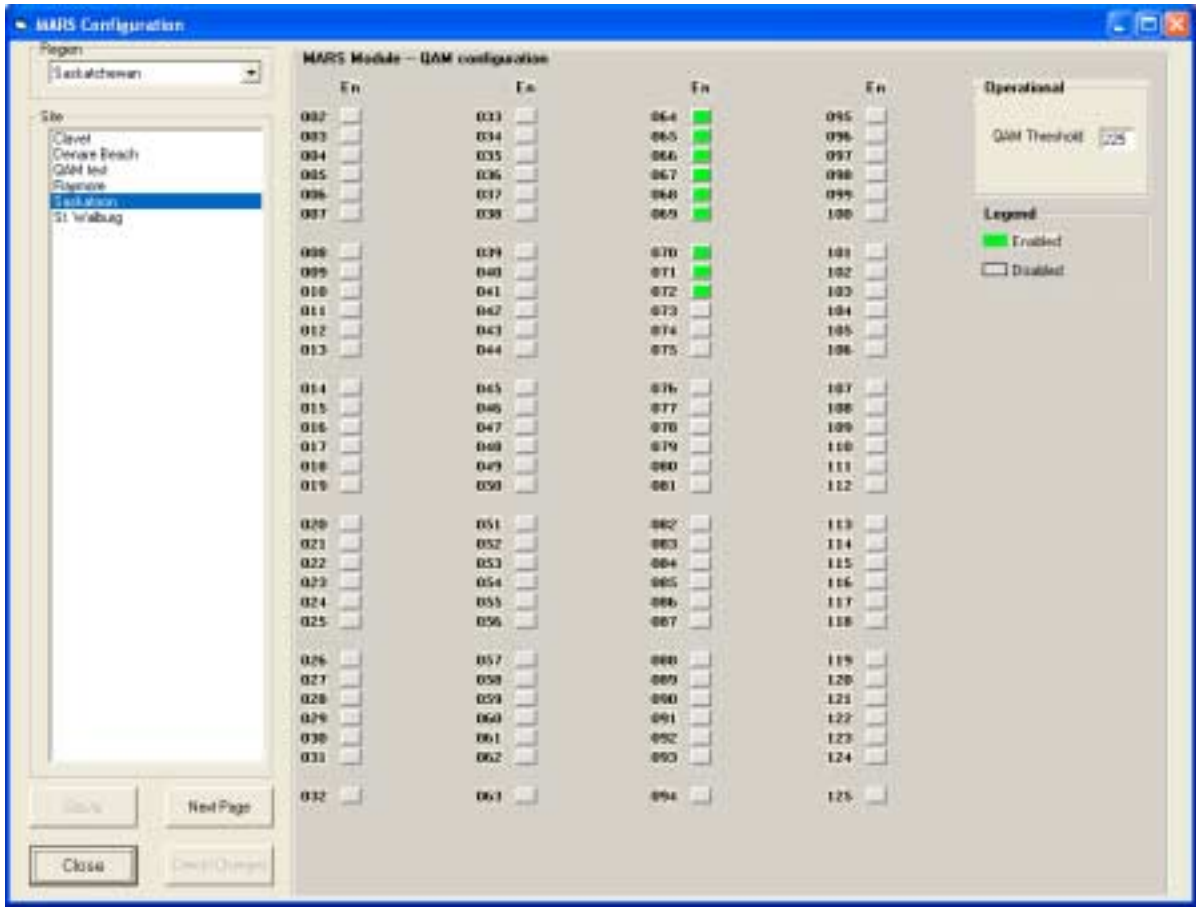


Figure 17: MARS Configuration, QAM Configuration Screen

8. Select the QAM channels that MARS should monitor by clicking on the "En" box beside each channel. Note that if a CATV channel is already configured for this channel, QAM cannot be configured. Alternately if QAM is previously configured then CATV cannot be configured for this channel.
9. Enter "225" in the "QAM Threshold" text box (225 is a "level" that would equate to an QAM RF input of about +8 dBmV). A QAM fault will be detected when the RF-level drops approximately 10 dB. See Appendix A for a calibration graph of values.
10. Click "Next Page" to advance to the Power Strip configuration screen (See **Figure 18**, below).

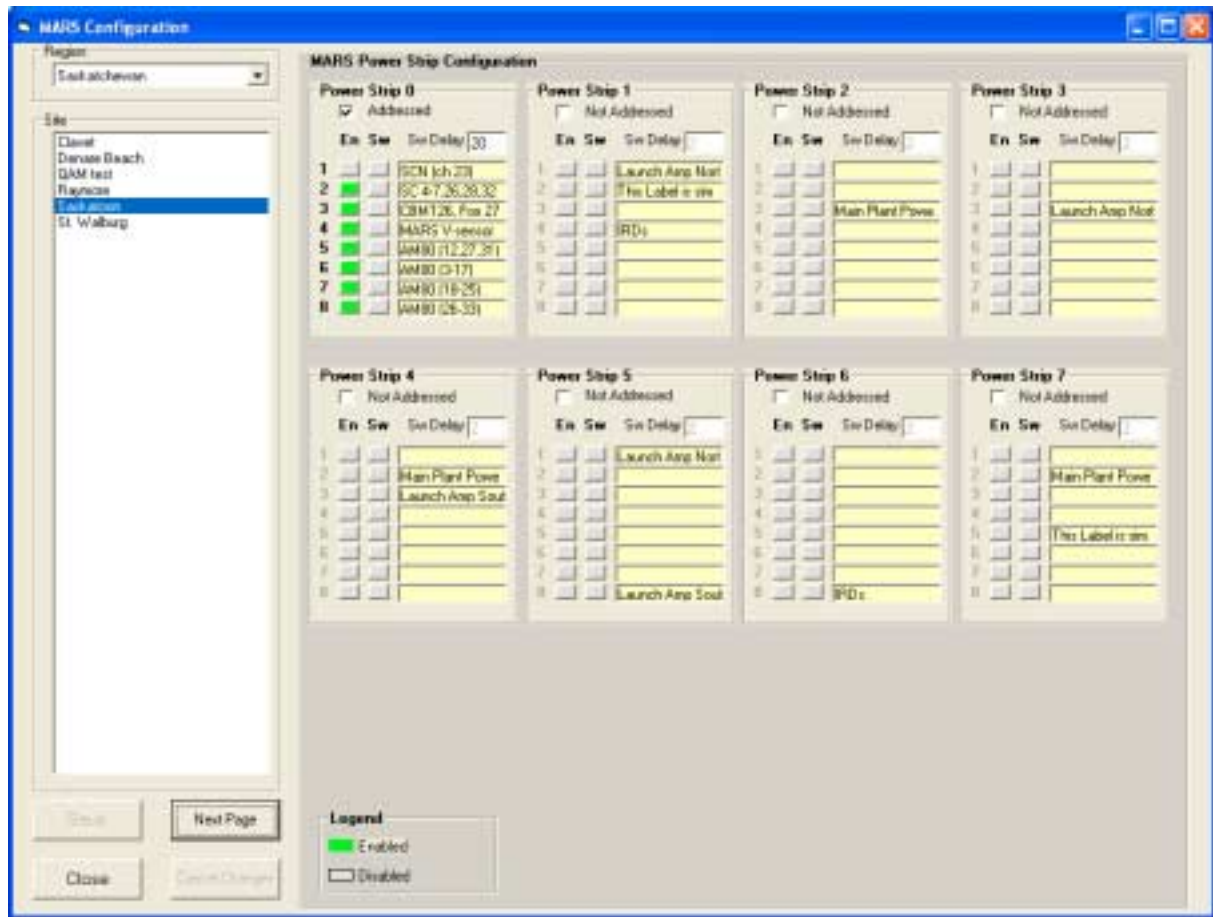


Figure 18: MARS Configuration, Power Strip Configuration Screen

11. This screen allows the configuration of up to 8 Power Strips. Each Power Strip can be configured to individually switch 120VAC power to each of its 8 receptacles. Enable a receptacle by clicking the "En" button associated with that receptacle (the button will turn GREEN). Additionally, each receptacle can be 'cycled' (turned off, then on) for a predetermined time. To cycle a receptacle, click the "Sw" button associated with the receptacle and enter a value between 1 and 255 seconds in the "Sw Delay" text box. On the next communication with the MARS site, the Power Strip will remove power from the receptacle for the specified time. (NOTE: After this command is sent to the MARS site or there is any communication attempt whether successful or not, all commands to 'cycle' Power Strips are cleared. This provides assurance that a Power Strip will not be cycled unintentionally at a later time.
12. The "Activate Site" and "De-Activate Site" will be discussed in the next section.
13. Select "Save" to store the selected information in the database.

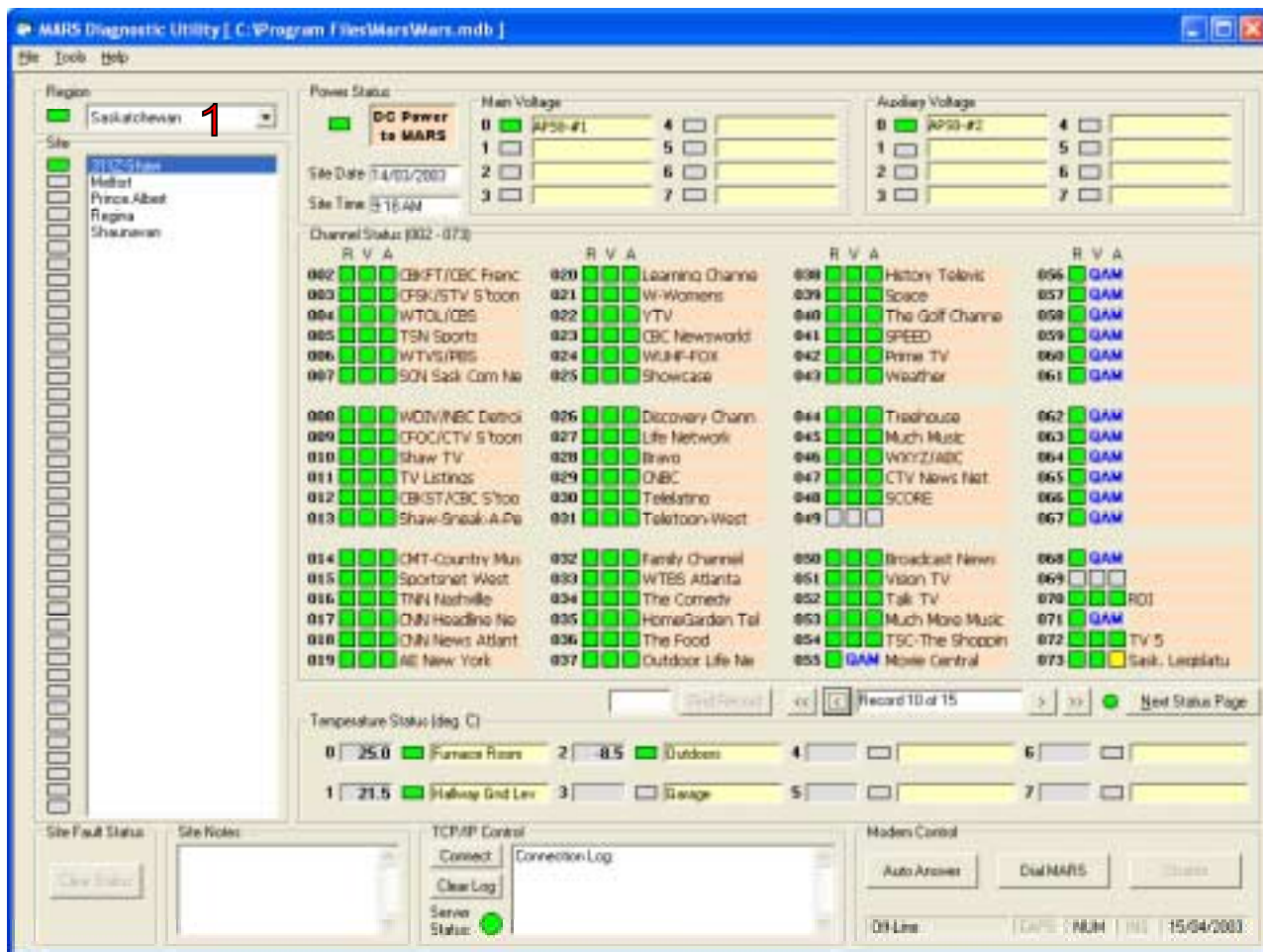


Figure 19: MARS Diagnostic Utility (MDU) main screen

4.6 Basic navigation of the MARS Diagnostic Utility (MDU)

To familiarize the operator with the MARS diagnostic screen navigation, a brief description of the controls follows:

- The Region can be selected by clicking on the combo box at the upper left corner of the MDU (See Item 1 on **Figure 19**, above). Selecting the region will cause the Site list box to be filled with associated sites.
- A Site is selected by clicking a site name in the Site list box. Selecting a Site causes the remainder of the screen to be filled with site status information.
- When a site is selected the “Connect” button is enabled in the TCP/IP section of the MDU screen. Selecting the “Connect” button will retrieve data from the selected MARS site (Assuming the site had previously been configured with necessary parameters).
- When a site is selected the "Answer" and "Dial MARS" buttons are enabled. Selecting the "Answer" button allows the PC to receive data from the MARS Sites via a dial-up connection. Selecting "Dial MARS" invokes a dial-up connection to

the selected MARS Site (Assuming the site had previously been configured with necessary parameters).

- The main screen is divided up into several sections. The MARS Power Status, located near the upper left area of the screen, displays the DC power status to the MARS module as well as the date and time of the current MARS status. Voltage status (main and auxiliary) is displayed at the top of the screen, while temperature is displayed near the bottom of the screen.

NOTE: By moving the cursor over the temperature display boxes, a ToolTip will appear displaying the current temperature trip point

- The center section displays the RVA (RF, Video, and Audio) status of all analog TV and QAM channels for which monitoring has been enabled. QAM channels are indicated by a “QAM” label beside the channel number.
- To display the results of the remainder of the channels, select the "Next Status Page" button located near the bottom right side of the Channel Status section (See **Figure 20**, below).
- In addition to RVA, the second status-page displays the “Alarm Sensors” and battery status. To return to the first status-page select the “Next Status Page” again.
- To the left of the “Next Status Page" button is a display of the current status record and the total number of status records for the selected site. Clicking the arrows on either side of the display retrieves previous or subsequent status data.

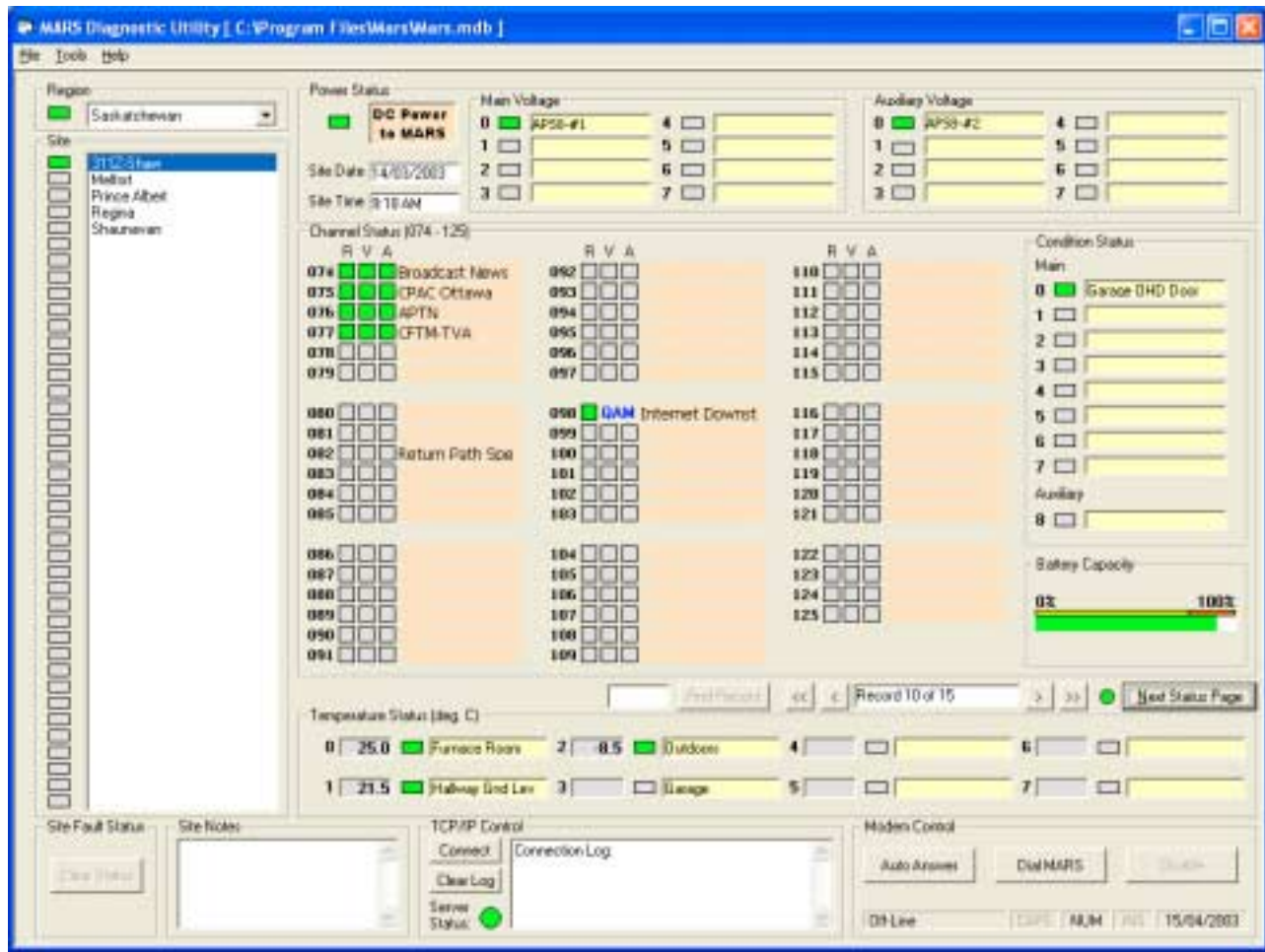


Figure 20: MARS Diagnostic Utility (MDU) main screen ('Second' status page)

4.7 Activating the MARS Site

- When a MARS site is created at the PC it is automatically assigned a "Site Code" that is permanently stored in the database on the PC. The site code cannot be altered. The Site can be deleted, though, and a new site under the same name can be created with a different site code. The same site code can never be duplicated.
- Select the MARS site for activation.
- Open the configuration window by selecting "MARS Configuration" from the Tools menu of the MDU screen. Ensure that the site to be activated is highlighted then select the "Activate Site" check box, then select "Close" to exit the configuration window. Note that "Activate Site" will appear in RED in the "Site Fault Status" frame on the MDU screen. The label will disappear after the MARS site has been activated.
- If modem communication is to be used:
 - Select "Dial MARS" in the "ModemControl" frame. The status line under the control box will reflect the MARS communication status. After connecting, the status line will display "Connected".

- The user can watch the status window for the message "Activating Site" to ensure that the MARS site is being activated. After communication is complete, the status window displays "Waiting for connection".
- If TCP/IP communication is to be used:
 - The MARS site is set up with a default username and password for TCP/IP communication. For site security, it is recommended that the username and password be changed, immediately. If this has not been done already in section **4.1 Setting Options**, see this section for instructions on providing a new TCP/IP username and password before proceeding.
 - Select the "Connect" button in the "TCP/IP Control" frame. The Connection log window will reflect the MARS communication status. The user can watch the log for the message "Activating Site" to ensure that the MARS site is being activated. After communication is complete, the log indicates that the connection to MARS has been closed.

Note: The message "Activating Site" in the log or status window confirms that the MARS site has been activated. If it does not appear, the steps must be repeated (the "Activate Site" check box automatically clears after each communication to prevent accidental re-configuration of the MARS).

- Activating the site does not update the database with the next status record. Following activation, the MARS site must be contacted to receive a status record. Retrieving a status record indicates that the MARS is configured correctly. To retrieve a status record, ensure the MARS site is highlighted in the site list box and then select the "Connect" button. On successful connection, a status record will be received and the number of status records should increase by one.
- The MARS site now retains a basic configuration. Testing automatic communication from the MARS site may be performed by (for instance) removing voltage from the power sensor module. When the data is received by the PC, the display rectangle next to the selected site will be RED indicating a fault--an asterisk ("*") will also appear beside the associated Region Name in the Region Combo box. The display rectangle to the left of the region name will also be RED indicating that there is a fault in the selected region.
- MARS is now ready for full operation.

4.8 Advanced Features and Settings

MARS has a number of features that allow it to be customized for various installation configurations. Note that some configuration changes to the MARS site can only be performed from a PC with the MARS Master software installed.

Note: For all requests to update the MARS site configuration from the PC, it is advisable to confirm that the request was sent to the MARS site. During communication with the MARS site, the PC log window will display the message "Data sent to MARS." if the update was successfully sent to the MARS. If this message does not appear, the update was not received at the MARS site and communication will have to be re-tried from the PC.

4.8.1. Changing MARS Port from PC

Select “Tools” then “Site Manager” from the MDU screen. Provide the ADMINISTRATOR password when prompted. On the Site Manager form, select the “change port” button and enter the new port. On the next communication with the MARS site, the port will be changed at the MARS site. Following this, the new port must be manually entered into the Port text box for future communications with the MARS site.

4.8.2 Changing MARS TCP/IP Username and Password from PC

To change the TCP/IP username and password of the MARS site from the PC, the TCP/IP username and password must first be changed or cleared at the PC (See **4.1 Setting Options** and **4.2 Entering Password information** to review this process). Then on the next communication with the MARS site, the new username and password will be reset. Following this reset, the new username and password will automatically be used for communications with the MARS site. Note: this process must be repeated for each MARS site that the PC is to communicate with.

4.8.3 Enabling Auto-configuration from MARS to PC

If an auto-detect was performed at the MARS site via the front control panel, it is possible to send this configuration information to the PC. This avoids the manual entry of the site’s configuration at the PC. In order to accomplish this, follow these steps:

Immediately following an auto-detect performed at the MARS site, at the PC select “Options...” from the Tools menu on the MDU screen. Under the "General" tab select "Enable auto-configuration from MARS to PC". Select “Save” then “Close”. Select the MARS site on the Main Screen, then connect to the site by selecting the “Connect” button or the “Dial MARS” button. The MARS site configuration will be received and stored at the PC. After receiving the update, select “Options...” from the Tools menu on the MDU screen. Under the "General" tab de-select "Enable auto-configuration from MARS to PC". Select “Save” then “Close”.

NOTE: This auto-configuration can only take place following a manual auto-detect at the MARS site. Once the PC has received the detected configuration from the MARS site, the MARS site cannot update the PC with its configuration until another auto-detect is done at the MARS site. This is to ensure that the PC’s configuration from this time on will update the MARS site configuration so that it is identical to the PC’s configuration.

4.8.4 Changing the PC Port Number

To change the port that the PC uses to accept communication from the MARS site, ensure that the database is opened then select “Tools” then “TCP/IP” Server. Beside the server port, enter the new port number to be used (Note: the number must be between 21 and 65535, inclusive). To save the new port number, select “File” then “Save Server Configuration”. Respond to the prompts to save the configuration and then close and restart the MARS PC application. Once the application is restarted, the changes will take effect at the PC. Now it is necessary to communicate with the MARS site to ensure that it gets updated with the new port required to reach the PC. Reminder: all PC’s that the MARS site contacts in the event of a fault must be using the same port.

4.8.5 Re-enabling a Disabled MARS Site

A disabled MARS site is inhibited from automatically communicating faults to PC(s). When the MARS site is in this state, it is still possible for a PC to communicate with the site to monitor and configure the site.

The MARS site may be in a disabled state for two reasons: 1. It has been disabled on-site by a technician (for example, while the technician is working on the monitored equipment) or 2. The site has reached the maximum daily transmissions specified at the PC in the Site Manager Form.

If the MARS site has been disabled it can be re-enabled by clicking on the “Re-enable site” checkbox in the Site Manager Form and then connecting to the MARS site to send this request.

4.8.6 De-Activating the MARS site

When a MARS site is de-activated, it is fully disabled. The MARS site will not automatically report faults or update status information on a PC that connects to it. To de-activate a site, open the configuration window by selecting “MARS Configuration” from the Tools menu on the MDU screen. Ensuring that the site to be de-activated is highlighted, select the "De-Activate Site" check box, then select "Close" to exit the configuration window. "De-Activate Site" will appear in RED in the "Site Fault Status" frame on the MDU screen. The label will disappear after the MARS site has been de-activated. On subsequent communications with the MARS site, the site will inform the PC that it is de-activated. The PC will display a BLACK rectangle beside the disabled site in the site list box on the MDU form.

Circumstances under which it may be desirable to de-activate a site:

1. There are frequent faults being reported due to unusual circumstances.
2. You wish to remove access to monitoring and control of the MARS site.
3. You wish to have the site inactive for a long term.

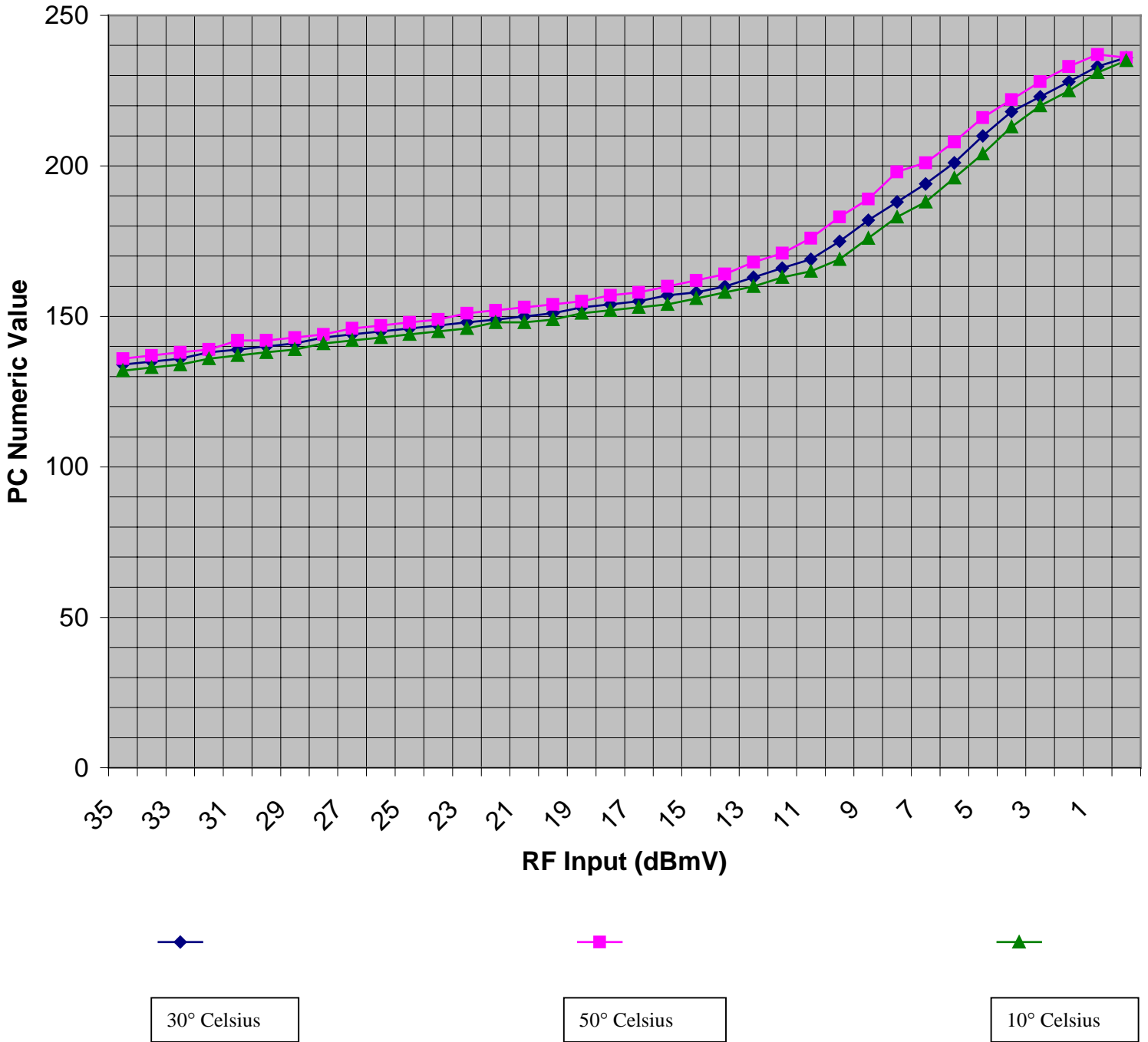
Compare this to a disabled MARS site. A disabled MARS site will automatically re-enable after Midnight. A de-activated MARS site will not automatically re-activate at any time in the future. A disabled MARS site can still provide status information to a PC that connects to it, A de-activated MARS site cannot provide status information to a PC that connects to it.

4.8.7 Re-Activating a MARS site

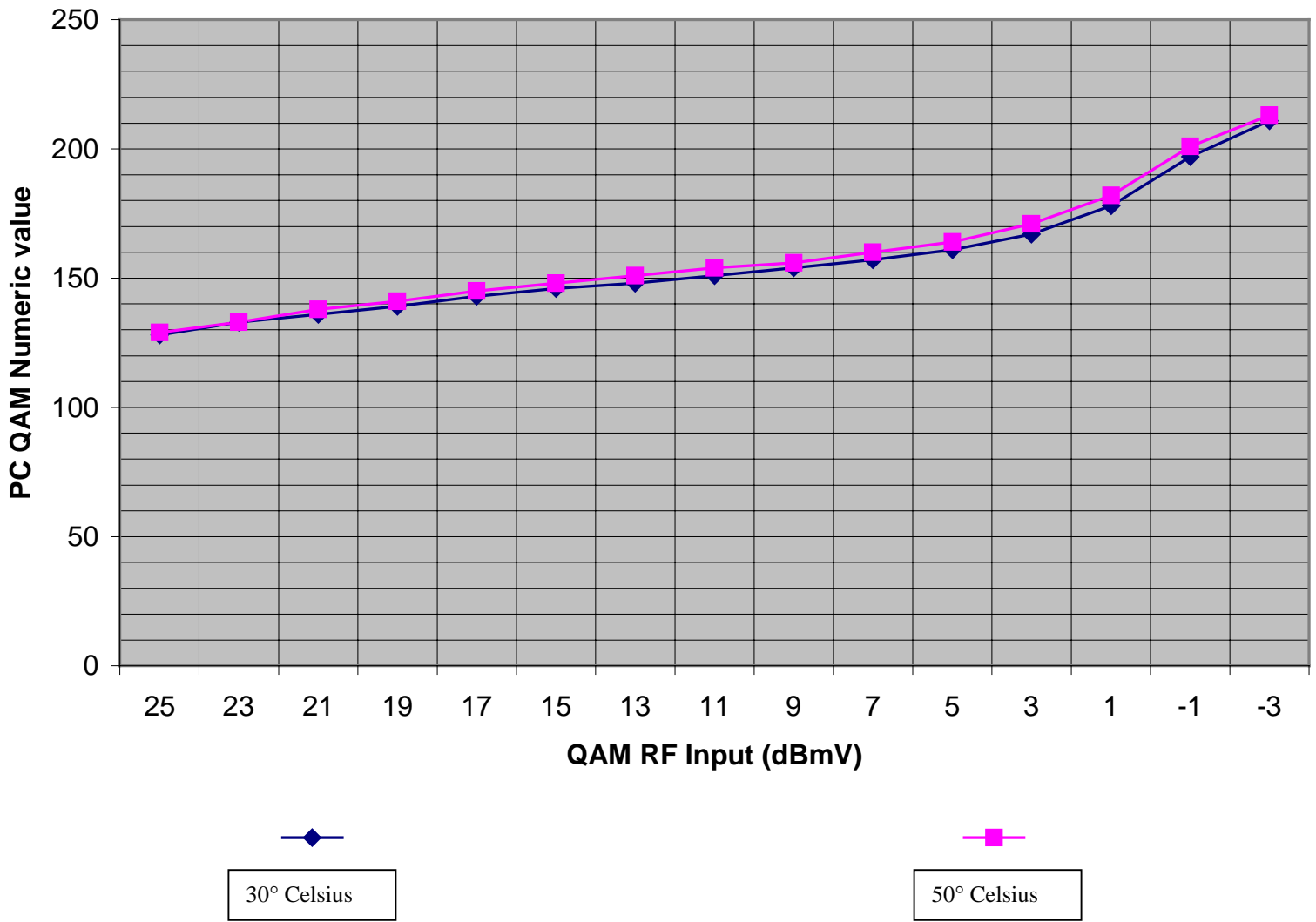
The steps to re-activate a MARS site are the same as those steps to activate the MARS site on initial installation (See Item **4.7 Activating the MARS Site**). Once those steps are taken, it is necessary to connect to the MARS site in order for the PC to display whether the site is re-activated. If the site was re-activated the rectangular display to the left of the site in the site list should be RED or GREEN (RED in the case of a status fault at site, GREEN in the case of no fault at site). If the site is not re-activated, the rectangular display beside the site will remain BLACK.

Appendix A – Calibration Graphs

Graph of MARS RF threshold values for CATV



Graph of MARS RF threshold values for QAM



Appendix B - I2C cable assembly instructions

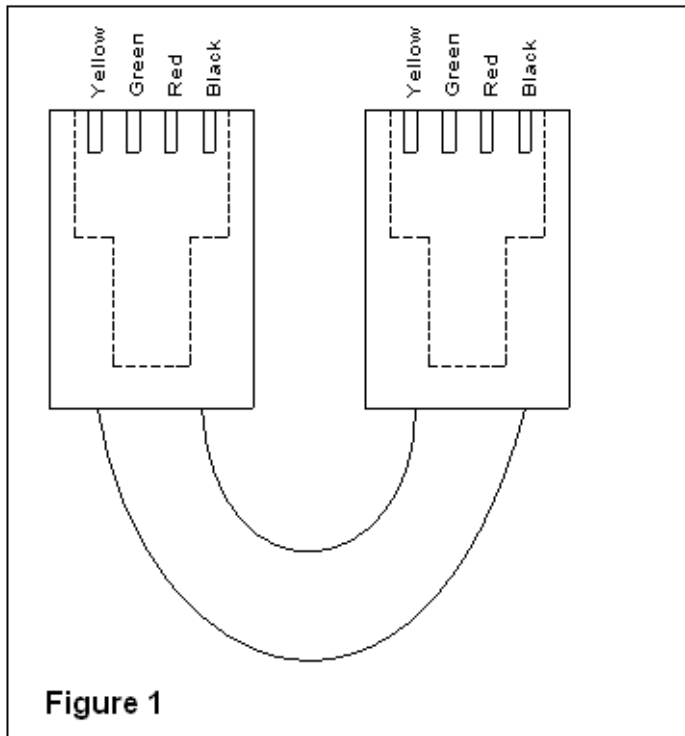
Cable Assembly for I2C Bus

Parts List:

- a) Handset Plugs
- b) Telephone cord(standard 4-wire)

Assembly:

1. Using conventional tool, connect handset plugs to telephone cord ensuring that the wires are ordered the same on each handset plug.
(See figure 1, below)



Note:

Dotted lines indicate hidden lines.
The hand set locking tab is viewed on the under side.

Appendix C MARS Specifications

Main Module Monitoring

CATV parameters RF, Video and Audio on Channels 2 to 125

Battery Backup

Type 6-volt (nominal) NiCAD pack
Charging Continous
Duration 30 to 90 minutes

Optional Sensing Devices

Temperature Maximum of 8 devices (-55 to 100 degrees Celsius)
Power Maximum of 8 devices (6 to 130 VAC/VDC)
Condition Maximum of 1 device (9 inputs total, 1 auxilliary output)

Remote Control Devices

Power Strip Maximum of 8 devices (8 outlets each)
Switch Maximum of 8 devices (8 terminals each)

Operating Temperature

Main Module 0 to 40 degrees C (32 to 104 degrees F)
Sensing Devices 0 to 50 degrees C (except for temperature module)

DC Power Input +9.2 VDC, 800ma

Mounting

Main Module Table top or rack mount
Sensing Devices Panel mount or wall bracket mount

Communication

Remote Ethernet/Analog Telephone Modem
Sensing Devices I2C Bus**

Dimensions

Mars Chassis 1.75"(h) x 17"(w) x 5"(d) (4.45 x 43.1 x 12.7 cm)

Connections

RF input I2C Bus** DC Input Jack
RJ45 Ethernet RJ11 Telephone Handset Jack
USB Port

** I2C: Inter-Integrated Circuit (a 2-wire bus specification developed by Philips Semiconductor)

Note: Specifications Subject to change