

D.A.D.

**Data
Acquisition
Display**

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Manual Part # 180-0559B



AMERICAN MINE RESEARCH, INC
P.O. BOX 234, ROCKY GAP, VA 24366
PH. 276-928-1712 FAX 276-928-1814

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DAD - View Sensor

TYPE	ADD	ENAB	COMM	VALUE
▶ 4210-CO	001	YES	YES	0.52 PPM
4210-CO	002	YES	YES	0.52 PPM
4210-CO	003	YES	YES	0.52 PPM
4210-CO	004	YES	YES	0.52 PPM
4210-CO	005	YES	YES	0.52 PPM
4210-CO	006	YES	YES	0.52 PPM
4210-CO	007	YES	YES	0.52 PPM
4210-CO	008	YES	YES	0.52 PPM
4210-CO	009	YES	YES	0.52 PPM
4210-CO	010	YES	YES	0.52 PPM
4210-CO	011	YES	YES	0.52 PPM
4210-CO	012	YES	YES	0.52 PPM
4210-CO	013	YES	YES	0.52 PPM
4210-CO	014	YES	YES	0.52 PPM
4210-CO	015	YES	YES	0.52 PPM
4210-CO	016	YES	YES	0.52 PPM

PAGE 00 CURSOR

EXIT UP DN UP DN DETAIL

DATA ACQUISITION DISPLAY

Production Through Technology **AMR**
AMERICAN MINE RESEARCH, INC.
P.O. BOX 234, ROCKY GAP, VA 24366

Figure 1, Data Acquisition Display Front Panel

1. INTRODUCTION

1.0. General

The American Mine Research DAD(Data Acquisition Display) unit is an enhancement to the MC-4000 Mine Wide Monitoring System. The unit serves two functions:

1.0.1. Listen Function—It may be placed anywhere in the mine to provide underground personnel access to the same mine monitoring system information made available to the Master Station operator. The unit is connected to the mine monitoring system communications data line and “listens” to the information exchange between the monitoring system Master Station and the monitoring system sensors and/or remotes. This information is interpreted by the unit and displayed on an LCD touch screen display.

1.0.2. Poll Function—It may be used by monitoring system maintenance personnel as a troubleshooting device to isolate communication line problems to a particular part of the mine. The user isolates the problem area communication line and connects the DAD unit to the “inby” sensors and remotes. The DAD unit “polls” the inby devices to establish proper operation of that particular section of the monitoring system.

The DAD unit may be powered by 115 VAC or it may receive power directly from the mine monitoring system communication +28 VDC line.

The mine monitoring system configuration is downloaded from the Master Station computer to the DAD unit using a serial port.

1.1. Features

The features of the DAD unit are summarized below:

- 115 VAC or 28 VDC powered.
- Rechargeable 1.3 amp hour battery.
- Monitoring System configuration downloaded by serial port.
- LCD touch screen display.
- Used underground to troubleshoot Mine Monitoring System.
- Used underground to provide remote and sensor information to working section personnel.
- “Sleep” mode when not being used to conserve battery.
- Displays communication line voltages, AC voltage and DC voltage.
- Biasing and termination of communication line.

2. SPECIFICATIONS

- Enclosure: Fiber Glass NEMA 3,4,6,12,13
- Size: 11"W x 13"H x 5.5"D
- Weight 11 lbs.
- Power 115 VAC @ 100 Ma.
or 15 VDC to 28 VDC @ 50 Ma.
- Battery 12 Volt, 1.3 Amp Hour, Gel Type
- Battery Trickle Charge 50 Ma.from Comm Line DC Power
- Battery Fast Charge 200 Ma.from 115 VAC Power
- Battery Current 330 Ma. When LCD Display ON
- DC Powered Wake-up Time 4 Minutes
- Configuration Via RS-232 Serial Port
- Operator Interface 4.75" x 3.5" Touch Screen LCD
- Comm Line Interface Fused, transient protected two wire
RS-485
- Communication Baud Rate 38,400 Baud
- 115 VAC Fuse 1/2 Amp, Fast Blow
- Comm Line Fuse 1/4 Amp, Fast Blow

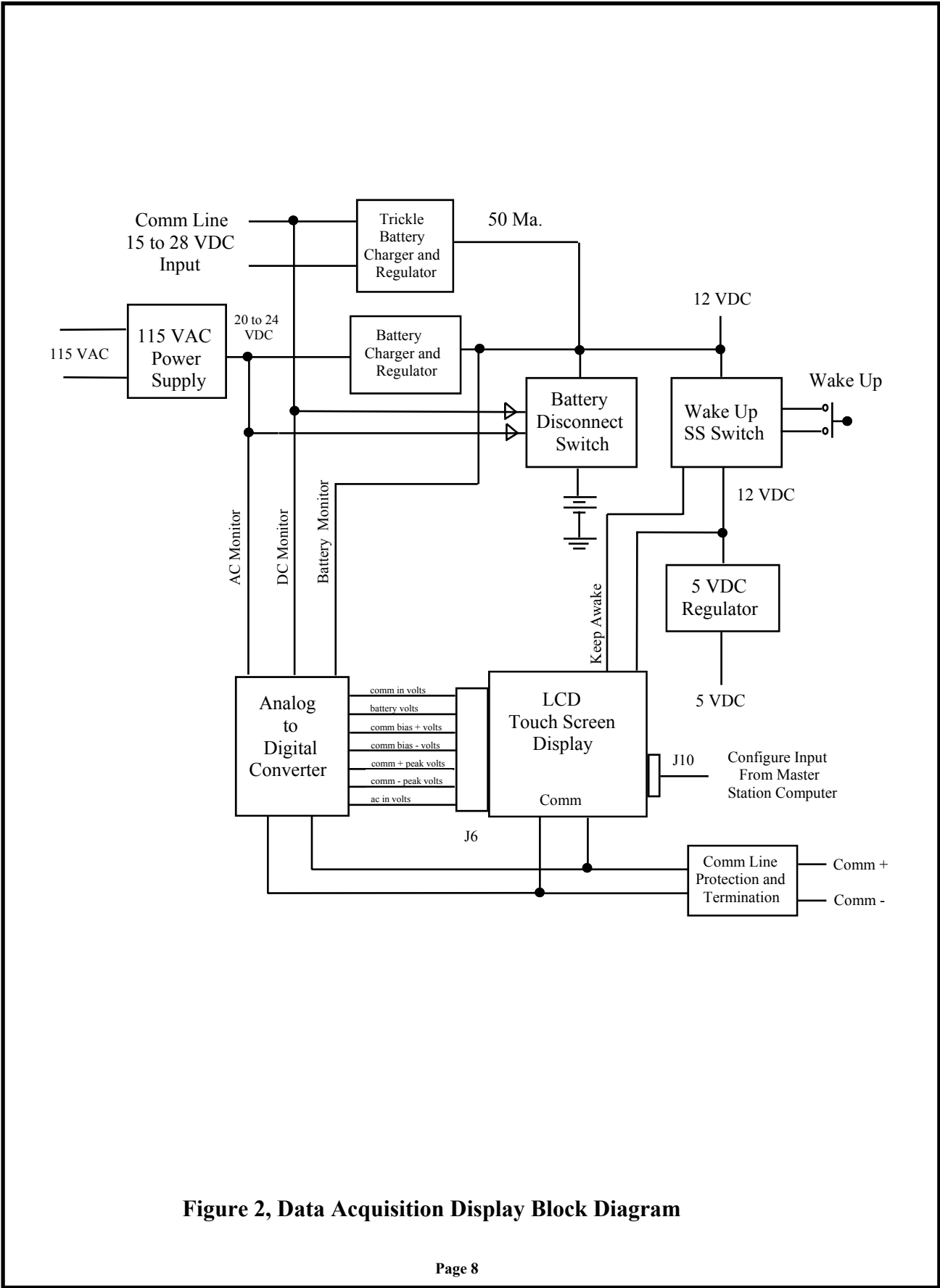


Figure 2, Data Acquisition Display Block Diagram

3. DESCRIPTION

Refer to Figure 1, Data Acquisition Display Block Diagram.

3.0. AC Power Supply and Battery Charger

The DAD unit may be powered from either 115 VAC or the 15 VDC to 28 VDC Communications Line DC voltage. When AC powered, the 115 VAC power supply provides 24 VDC to a batter charger and regulator. The battery charger has both a "fast charge" and "trickle charge" capability. When the charging current drops below 100 milliamperes, indicating the battery is nearly charged, the charger automatically switches to the "trickle charge" mode.

3.1. DC Power Supply Battery Charger

When the DAD unit is powered from the Comm Line DC power, the battery charging current is limited to 50 milliamperes. When Comm Line powered, the DAD unit monitors the LCD touch screen for operator activity. During this time, power to operate the LCD display and other circuitry is being provided primarily by the battery. If no LCD display buttons are pressed over an interval of 4 minutes, the DAD unit enters a "sleep" mode and turns OFF the LCD display and the battery is "trickle charged" again.

3.2. Battery Disconnect Switch

A solid-state Battery Disconnect Switch connects the battery to the DAD unit LCD display and other circuitry if 115 VAC or Comm Line DC voltage is applied to the unit.

3.3. Wake-Up Switch

A solid-state Wake-Up Switch connects 12 VDC to the LCD display and to the 5 VDC regulator when the Wake-Up switch (mounted on the enclosure) is pressed. A Keep-Awake pulse, generated by the DAD unit microprocessor, is applied to the Wake-Up switch as long as there is LCD display operator activity.

3. DESCRIPTION(cont.)

3.4. Analog to Digital Converter

An Analog to Digital Converter accepts voltage inputs from the AC power supply, DC Comm Line, Battery and Comm Data Line. The converter delivers the digital equivalent of the analog voltage inputs to the LCD Touch Screen display. These voltages may be view by the operator on the LCD display using the VU COMM LINE display menu.

3.5. LCD Touch Screen Display

The LCD Touch Screen Display receives Comm Line data through a RS-485 serial port. In the "Listen" mode application, this data contains the Master Station requests for information from sensors and remotes and it contains Master Station control commands to sensors and remotes. The data also contains the replies from sensors and remotes. The DAD unit monitors the data exchange between Master Station, sensor and remotes and displays this information on the LCD touch screen. Prior to using the DAD unit, the Mine Monitoring System Configuration is downloaded from the Master Station computer to the DAD unit via the RS-232 Serial Port at J10.

4. OPERATION

4.1. Configuration

Before the DAD unit may be used, the mine monitoring system configuration must be download to the DAD unit. This allows the DAD unit to properly associate each sensor or remote address with the Master Station configuration data. This is accomplished in the following manner:

- 1) Run the DAD CONFIG program provided by AMR on the Master Station computer.
- 2) Open the File tab and the click on the Create button.
- 3) Using a serial cable, connect the Master Station computer serial port to the DAD LCD Touch Screen Display J10 connector.
- 4) Apply either 115 VAC or Comm Line 28 VDC to the DAD unit
- 5) Press the Wake-Up switch on the side of the DAD unit and observe that the LCD display illuminates.
- 6) On the DAD Entry Menu Screen press the **MENU** button.
- 7) On the DAD Main Menu Screen press the **CONFIGURE** button.
- 8) When in the DAD Configuration Menu Screen press the **START CONFIG** button.
- 9) The menu “**Status**” area of the screen with change from **Wait** to **Continue**.
- 10) At the Master Station computer click on the Download button. The DAD unit Configuration Menu Screen “**Packet #**” area increment from 1 to 81. When the “**Packet #**” indicates 81, the “**Status**” area of the screen will change from **Continue** to **Complete**.
- 11) The DAD unit now has saved the mine monitoring system configuration data.
- 12) Disconnect the serial cable between the Master Station and the DAD unit. The unit is ready to be put in service as a communications “Listening Mode” device or as a troubleshooting “Polling Mode” device.

4.2 Listening Mode

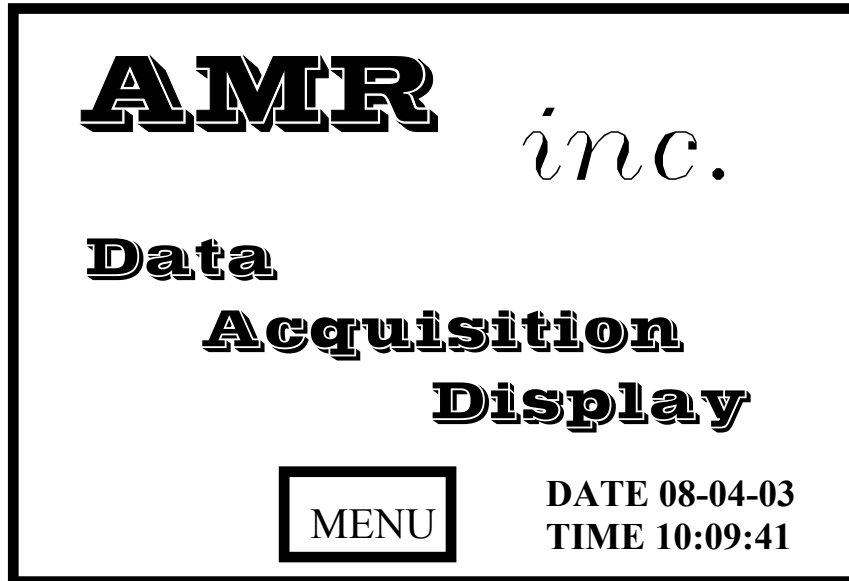
Connect power (115 VAC or Comm DC) and the communications data line to the DAD unit as described the **Installation Section** of this manual. Press the Wake-Up switch on the side of the enclosure until the LCD display illuminates.

In the “Listening Mode”, the DAD unit monitors the Master Station message sent to each sensor and remote and interprets the response from each sensor and remote. The DAD unit identifies the address and type (type of sensor and type of remote) and from the configuration data file, displays the response on the LCD Touch Screen display. The sensor and remote responses are accessed through a series of screens.

4. OPERATION(cont.)

4.2.1. DAD Entry Screen

The screen shown below appears on applying power to the DAD unit. It displays the “real time clock” settings and is the menu used to access the Main Menu. Press the MENU button and observe the Main Menu.



4. OPERATION(cont.)

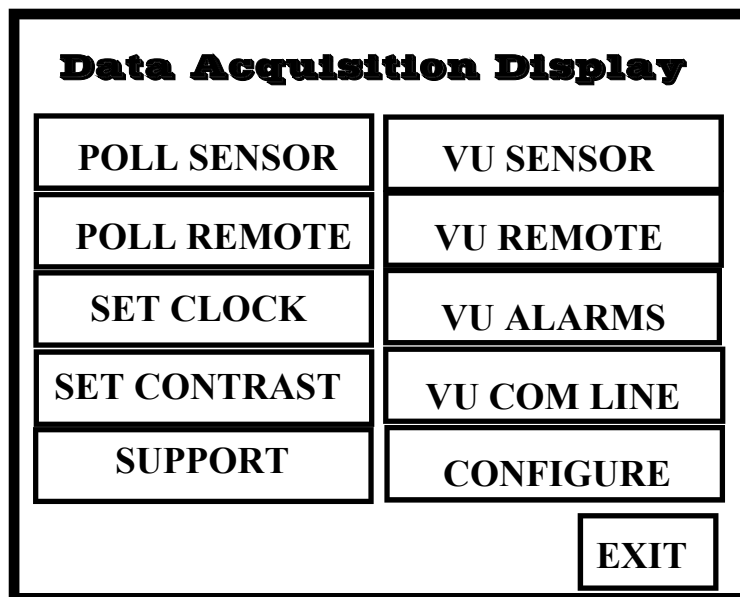
4.2.2. DAD Main Menu Screen

The Main Menu Screen is used to:

- 1) Access the "Listen Mode" menu screens to View Sensor and Remote data;
- 2) Access the "Poll Mode" menu screens to Poll Sensors and Remote;
- 3) Access the Set Clock menu screen to set the real time clock if necessary;
- 4) Access the Set Contrast menu screen to set LCD Display Contrast if necessary;
- 5) Access the Support screen to get the AMR support phone number;
- 6) Access the View Alarms screen to check sensors that have reached the Warn or Alarm level;
- 7) Access the View Comm Line screen to check voltage levels on the communications line;
- 8) Access the Configure screen to download Master Station configuration data.

To access any of the above screens, press the desired menu screen button until the display begins to rewrite.

To return to the Entry Menu screen, press the Exit button until the display begins to rewrite.



4. OPERATION(cont.)

4.2.3. DAD Support Screen

The Support Screen provides the user with AMR's technical support number.

To return to the Main Menu screen, press the Exit button until the display begins to rewrite.



4. OPERATION(cont.)

4.2.4. DAD Set Clock Screen

When the Set Clock screen is initially written the current date and time are displayed. The time is **not updated** so the displayed time should be compared to the real time. If the date and/or time is incorrect use the following steps to set the date and/or time.

- 1) To set the date, press the **Yr, Mon** or **Day +** or—button and observe that the displayed date changes appropriately. When the correct date is displayed, press the **Set** button.
- 2) To set the time, press the **Hr, Min** or **Sec +** or—button and observe that the displayed date changes appropriately. When the correct time is displayed, press the **Set** button.

To return to the Main Menu screen, press the Exit button until the display begins to rewrite.

+Yr	+Mon	+Day
-Yr	-Mon	-Day
2003 Aug. 04		
11 : 24 : 45		
+Hr	+Min	+Sec
-Hr	-Min	-Sec
Set		Exit

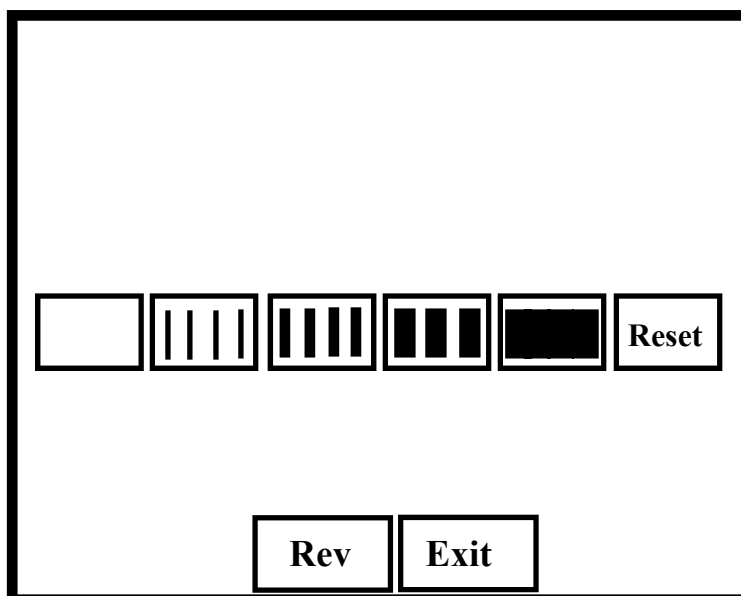
4. OPERATION(cont.)

4.2.5. DAD Set Contrast Screen

Use the Set Contrast Menu screen to optimize the LCD display contrast for the existing lighting conditions.

- 1) Pressing the darker buttons will cause the display to darken.
- 2) Pressing the lighter buttons will cause the display to lighten.
- 3) The Rev button will cause the display background to reverse between blue and white.
- 4) The Reset button will cause the display to return to the preset values.

To return to the Main Menu screen, press the Exit button until the display begins to rewrite.



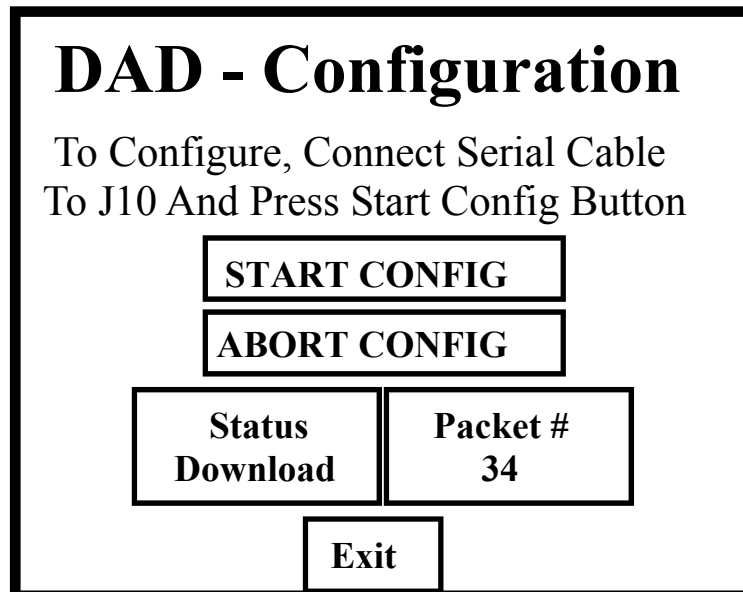
4. OPERATION(cont.)

4.2.6. DAD Configuration Screen

Before the DAD unit may be used, the mine monitoring system configuration must be download to the DAD unit. This allows the DAD unit to properly associate each sensor or remote address with the Master Station configuration data. This is accomplished in the following manner:

- 1) Run the DAD CONFIG program provided by AMR on the Master Station computer.
- 2) Open the File tab and the click on the Create button.
- 3) Depending on computer and/or type of cable (see Page 18). Connect the Master Station computer serial port to the DAD LCD Touch Screen Display J10 connector.
- 4) When in the DAD Configuration Menu Screen press the **START CONFIG** button.
- 5) The menu “**Status**” area of the screen with change from **Wait** to **Continue**.
- 6) At the Master Station computer click on the Download button. The DAD unit Configuration Menu Screen “**Packet #**” area will increment from 1 to 81. When the “**Packet #**” indicates 81, the “**Status**” area of the screen will change from **Continue** to **Complete**.
- 7) The DAD unit now has saved the mine monitoring system configuration data.
- 8) Disconnect the serial cable between the Master Station and the DAD unit. The unit is ready to be put in service as a communications “Listening Mode” device or as a troubleshooting “Polling Mode” device.

To return to the Main Menu screen, press the Exit button until the display begins to rewrite.



4. OPERATION(cont.)

4.2.6.a Choosing configuration cable and Setup.

* If the computer has a COM2 port, use a Serial to Serial cable (AMR Part # 195-0227). Return to page 17, step 3.

* If the computer has a only a COM1 port, use a Serial to Serial cable (AMR Part # 195-0227). Follow the steps on this page.

* If the computer does not have COM2 port but has a USB port, use USB to Serial cable (AMR Part # 195-0228). Use setup process on page 19.

Step 1. Open DADConfig.exe and click File>Create and then close DADConfig.exe

Step 2. Close WinMac and restore Com1 to the original Windows driver only if using XP, 2000, or Millennium, by clicking Start, and right click on My Computer and left click on properties. Click on the Hardware tab and then click on the Device Manager button. Click on the plus sign next to Ports (COM & LPT). Then right click Com1 and Left click Update Driver...>Advanced>Next>Don't Search>Communication Port>Next>Finish.

Step 3. Click Start>Run... – type regedit and click Ok. In Registry Editor click the “+” beside of: HKEY_USERS> .DEFAULT>Software>DadConfig>Settings
Then on the right side of the Registry Editor window double click on “CommPort” and change the “Value data” to the Com port 1 (COM1), click Ok and close Registry Editor.

Step 4. Turn on DAD-P unit, press Menu>Configure>Start Config

Step 5. Open DADConfig.exe again, click File>Create>Tools>Download. After the software download 81 packets, it will be complete and if no error, disconnect cables, close DADConfig.exe, and you are ready to use the DAD-P unit!

Step 6. If the Windows com port driver had to be changed, then the driver must be reinstalled for WinMac to work properly by going to Start, and right click on My Computer and left click on properties. Click on the Hardware tab and then click on the Device Manager. Click on the plus sign next to Ports (COM & LPT). Then right click Com1 and Left click Update Driver...>Advanced>Next>Don't Search>Communication Port(ACPI>Next>Finish.

To return to page 17, step 7.

4. OPERATION(cont.)

4.2.6.a Choosing configuration cable and Setup (cont.).

* If the computer has a COM2 port, use a Serial to Serial cable (**AMR Part # 195-0227**). Return to page 17, step 3.

* If the computer has only a COM1 port, use a Serial to Serial cable (**AMR Part # 195-0227**). Use setup process on page 18.

* If the computer does not have a COM2 port but has a USB port, use USB to Serial cable (**AMR Part # 195-0228**). Follow the steps on this page.

Step 1. Open DADConfig.exe and click File>Create and then close DADConfig.exe

Step 2. Install USB to Serial cable software:

Step 3. In order to check the installation and the COM port number for the USB to Serial cable, go to Start, and right click on My Computer and left click on properties. Click on the Hardware tab and then click on the Device Manager. Click on the plus sign next to Ports (COM & LPT). Under this heading you should see Serial on USB Port (COMxx) where xx is the port number. This would be the number that you would choose in the DAD Configuration software.

Step 4. Note the COMxx port number and Click Start>Run... – type regedit and click Ok. In Registry Editor click the “+” beside of: HKEY_USERS> .DEFAULT>Software>DadConfig>Settings
Then on the right side of the window double click on “CommPort” and change the “Value data” to the Com port number note from step 3, click Ok and close Registry Editor.

To return to page 17, step 3.

4. OPERATION(cont.)

4.2.7. DAD View Comm Line Screen

The DAD View Comm Line screen displays the following voltages to allow the user to evaluate the DAD unit power supply and the communications line conditions:

- 1) Comm Line DC Volts—Displays the DC voltage provided by the communications line. This voltage should be between 15 VDC and 28 VDC.
- 2) AC Input DC Volts—Displays the DC voltage provided by the power supply. It is an indication of proper AC input voltage and should be between 20 VDC and 24 VDC.
- 3) Battery Volts—Displays the voltage provided by the battery. It is an indication of the battery charge level and should be between 12 VDC and 13.5 VDC.
- 4) + Comm Line Bias—Displays the bias voltage on the + Comm Data Line. It should be between 2.0 and 2.6 VDC.
- 5) - Comm Line Bias—Displays the bias voltage on the - Comm Data Line. It should be between 1.7 and 2.3 VDC. The difference between the + Comm Data Line bias and the - Comm Data Line bias should be between 0.15 and 0.45 VDC.
- 6) + Comm Line Peak—Displays the Peak voltage level on the + Comm Data Line. It should be 1 to 3 volts greater than the + Comm Line Bias voltage.
- 7) - Comm Line Peak—Displays the Peak voltage level on the - Comm Data Line. It should be 1 to 3 volts greater than the - Comm Line Bias voltage.

To return to the Main Menu screen, press the Exit button until the display begins to rewrite.

DAD - View Comm Line		
COM LINE DC VOLTS	————	25.3
AC INPUT DC VOLTS	————	23.6
BATTERY VOLTS	————	13.3
+ COM LINE BIAS	————	2.4
- COM LINE BIAS	————	2.1
+ COM LINE PEAK	————	4.4
- COM LINE PEAK	————	4.1

Exit

4. OPERATION(cont.)

4.2.9. DAD View Sensor Screen

The DAD unit View Sensor menu screen allows the user to quickly view the performance of a block or page of 16 sensors beginning with address 1. The sensor location, address, Comm Enabled(YS/NO), Comm Status(OK/NO) and sensor value are displayed.

Use the Page Up/Down buttons to view the next or previous page of 16 sensors.

To view more information about a particular sensor, use the Cursor Up/Down buttons to move the cursor to the desired sensor address. Press the Detail button until the screen begins to rewrite.

See section 4.2.9.1 for a description of the MC-4110 Sensor Detail Screen.

See section 4.2.9.2 for a description of the MC-4210 Sensor Detail Screen.

DAD - View Sensor						
	LOCATION	AD	EN	CM	VALUE	
cursor →	SENSOR LOCATION	001	YS	OK	0.52	PPM
	SENSOR LOCATION	002	YS	OK	0.52	PPM
	SENSOR LOCATION	003	YS	OK	0.52	PPM
	SENSOR LOCATION	004	YS	OK	0.52	PPM
	SENSOR LOCATION	005	YS	OK	0.52	PPM
	SENSOR LOCATION	006	YS	OK	0.52	PPM
	SENSOR LOCATION	007	YS	OK	0.52	PPM
	SENSOR LOCATION	008	YS	OK	0.52	PPM
	SENSOR LOCATION	009	YS	OK	0.52	PPM
	SENSOR LOCATION	010	YS	OK	0.52	PPM
	SENSOR LOCATION	011	YS	OK	0.52	PPM
	SENSOR LOCATION	012	YS	OK	0.52	PPM
	SENSOR LOCATION	013	YS	OK	0.52	PPM
	SENSOR LOCATION	014	YS	OK	0.52	PPM
	SENSOR LOCATION	015	YS	OK	0.52	PPM
	SENSOR LOCATION	016	YS	OK	0.52	PPM

		PAGE 00		CURSOR		
EXIT	UP	DN	UP	DN	DETAIL	

4. OPERATION(cont.)

4.2.9.1. DAD View MC-4110 Sensor Detail Screen

The DAD unit View MC-4110 Sensor Detail screen provides extensive information about the sensor. This information is detailed as follows:

- 1) Location label—The sensor's location as defined in the Master Station configuration file.
- 2) Type—MC-4110 or MC-4210.
- 3) Address—001 through 255.
- 4) Poll/Reply—As the screen is first written, the number of times the sensor has been Polled counter is reset and then is incremented along with the number of sensor Replies. This informs the user of the sensor's communication reliability.
- 5) Digital Channels—The name and state of the digital channels, as labeled in the Master Station configuration file, are displayed.
- 6) Control Channels—The name and state of the control channels, as labeled in the Master Station configuration file, are displayed.
- 7) Analog Channels—The name and value of the analog channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Sensor Menu screen, press the Exit button until the display begins to rewrite.

DAD - Sensor Detail			
First North Belt Drive			
TYPE	ADD	POLL	REPLY
MC-4110-CO	001	00500	00500
DIGITAL CHAN			CONTROL CHAN
#	NAME	STAT	#
0	SENSOR TEST	OFF	0
1	SENSOR CALIB	OFF	1
2	DIG CH0 NOT USED		2
3	DIG CH1 NOT USED		3
ANALOG CHANNELS			
CHAN	NAME	VALUE	UNIT
0	CARBON MONOXIDE	0.12	PPM
1	AN CH0 NOT USED		
2	AN CH1 NOT USED		
			EXIT

4. OPERATION(cont.)

4.2.9.2. DAD View MC-4210 Sensor Detail Screen

The DAD unit View MC-4210 Sensor Detail screen provides extensive information about the sensor. This information is detailed as follows:

- 1) Location label—The sensor's location as defined in the Master Station configuration file.
- 2) Type—MC-4110 or MC-4210.
- 3) Address—001 through 255.

Poll/Reply—As the screen is first written, the number of times the sensor has been Polled counter is reset and then is incremented along with the number of sensor Replies. This informs the user of the sensor's communication reliability.

- 5) Digital Channels—The name and state of the digital channels, as labeled in the Master Station configuration file, are displayed.
- 6) Control Channels—The name and state of the control channels, as labeled in the Master Station configuration file, are displayed.
- 7) Analog Channels—The name and state of the analog channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Sensor Menu screen, press the Exit button until the display begins to rewrite.

DAD - Sensor Detail					
First North Belt Drive					
TYPE	ADD	POLL	REPLY		
MC-4210-CO	001	00500	00500		
DIGITAL CHAN			CONTROL CHAN		
#	NAME	STAT	#	NAME	STAT
0	SENSOR TEST	OFF	0	WARN OUTPUT	OFF
1	SENSOR CALIB	OFF	1	ALARM OUTPUT	OFF
2	Sensor Digital	OFF	2	Sensor Control	OFF
3	Sensor Digital	OFF	3	Sensor Control	OFF
ANALOG CHANNELS					
CHAN	NAME	VALUE	UNIT		
0	CARBON MONOXIDE	0.12	PPM		
1	Sensor Analog	0.04	Volts		
2	Sensor Analog	0.04	Volts		
			EXIT		

4. OPERATION(cont.)

4.2.10. DAD View Remote Screen

The DAD unit View Remote menu screen allows the user to quickly view the performance of a block or page of 10 remotes beginning with address 1. The remote type(BM-4000, CB-PRO, MC-4020, MC-4025, MC-4020/RS, MC-4040/s, MC-4020/R, MC-4040), remote location, address, Comm Enabled(YS/NO) and Comm Status(OK/NO) are displayed.

Use the Page Up/Down buttons to view the next or previous page of 10 remotes.

To view more information about a particular remote, use the Cursor Up/Down buttons to move the cursor to the desired remote address.

Press the Analog button to view Analog Channel detail information.

Press the Digital button to view Digital Channel detail information.

Press the Control button to view Control Channel detail information.

See section 4.2.10.1 through 4.2.10.3 for a description of the BM-4000 Detail Screens.

See section 4.2.10.4 through 4.2.10.6 for a description of the CB-PRO Detail Screens.

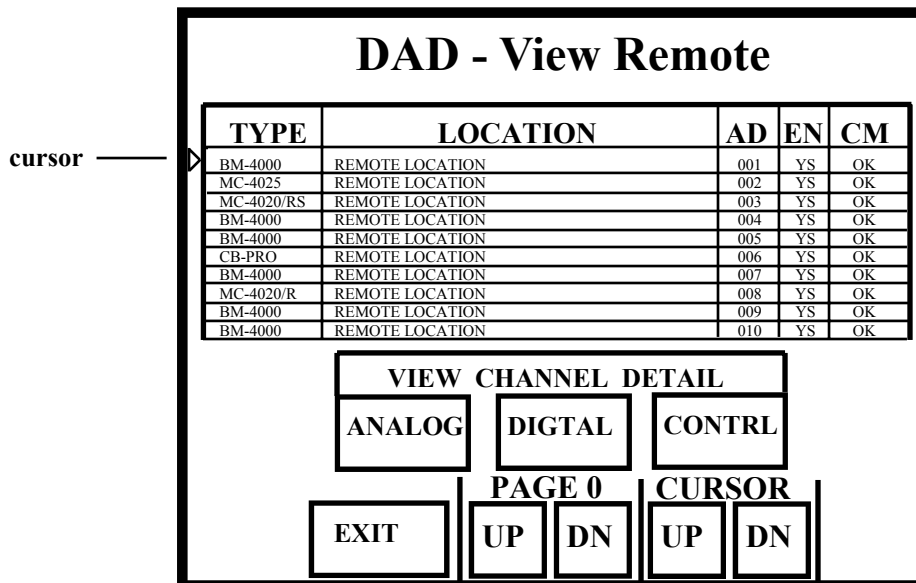
See section 4.2.10.7 through 4.2.10.9 for a description of the MC-4020 Detail Screens.

See section 4.2.10.10 through 4.2.10.12 for a description of the MC-4025 Detail Screens.

See section 4.2.10.13 through 4.2.10.15 for a description of the MC-4020/RS and MC-4040/S Detail Screens.

See section 4.2.10.16 through 4.2.10.17 for a description of the MC-4020/R and MC-4040 Detail Screens.

To return to the Main Menu screen, press the Exit button until the display begins to rewrite.



4. OPERATION(cont.)

4.2.10.1. DAD View BM-4000 Remote Analog Detail Screen

The DAD unit View BM-4000 Remote Analog Detail screen provides information about the Belt Master remote and about the Belt Master remote analog channel data. This information is detailed as follows:

- 1) Location label—The Belt Master's location as defined in the Master Station configuration file.
- 2) Type—BM-4000 Belt Master.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the Belt Master's communication reliability.
- 5) Analog Channels—The name and value of the analog channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Analog Channel Detail			
First North Belt Master			
TYPE	ADD	POLL	REPLY
BM-4000	001	00500	00500
ANALOG CHAN			
#	NAME	VALUE	
0	CO LEVEL	4.77	
1	Motor A Current	245.39	
2	Motor B Current	245.39	
3	Motor C Current	245.39	
4	Water Flow	558.63	
5	Water Pressure	559.02	
6	Hydraulic Pressure	2239.1	
7	Low Battery	27.7	
ANALOG CHAN			
#	NAME	VALUE	
8	Drive Speed	100	
9	Belt Speed	100	
10	Sequence Speed	100	
11	Dust Speed	100	
			EXIT

4. OPERATION(cont.)

4.2.10.2. DAD View BM-4000 Remote Digital Detail Screen

The DAD unit View BM-4000 Remote Digital Detail screen provides information about the Belt Master remote and about the Belt Master remote digital channel status. This information is detailed as follows:

- 1) Location label—The Belt Master’s location as defined in the Master Station configuration file.
- 2) Type—BM-4000 Belt Master.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the Belt Master’s communication reliability.
- 5) Digital Channels—The name and status of the digital channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Digital Channel Detail					
First North Belt Master					
TYPE	ADD	POLL	REPLY		
BM-4000	001	00500	00500		
DIGITAL CHAN			DIGITAL CHAN		
#	NAME	STAT	#	NAME	STAT
0	Coupler Temp	OK	8	Dust Enable	Yes
1	Belt Alignment	OK	9	Speed Enable	Yes
2	Circuit Breaker	Closed	10	Sequence Enable	Yes
3	Ckt Brkr Fault	OK	11	Slip Enable	Yes
4	115 VAC Loss	OK	12	Dust Fault	OK
5	Spill Switch	OK	13	Speed Fault	OK
6	Deluge	OK	14	Sequence Fault	OK
7	Remote Switch	OK	15	Slip Fault	OK
KEY	BELT	STATUS MESSAGE		EXIT	
Auto	Run	Running			

4. OPERATION(cont.)

4.2.10.3. DAD View BM-4000 Remote Control Detail Screen

The DAD unit View BM-4000 Remote Control Detail screen provides information about the Belt Master remote and about the Belt Master remote control channel status. This information is detailed as follows:

- 1) Location label—The Belt Master's location as defined in the Master Station configuration file.
- 2) Type—BM-4000 Belt Master.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the Belt Master's communication reliability.
- 5) Control Channels—The name and status of the control channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Control Channel Detail			
First North Belt Master			
TYPE	ADD	POLL	REPLY
BM-4000	001	00500	00500

CONTROL CHAN		
#	NAME	STAT
0	Belt Control	Run
1	Remote Control	Off
2	Remote Control	Off
3	Remote Control	Off
4	Remote Control	Off
5	Remote Control	Off

EXIT

4. OPERATION(cont.)

4.2.10.4. DAD View CB-PRO Remote Analog Detail Screen

The DAD unit View CB-PRO Remote Analog Detail screen provides information about the CB-PRO remote and about the CB-PRO remote analog channel data. This information is detailed as follows:

- 1) Location label—The CB-PRO's location as defined in the Master Station configuration file.
- 2) Type—CB-PRO Circuit Breaker.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the CB-PRO's communication reliability.
- 5) Analog Channels—The name and value of the analog channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Analog Channel Detail			
First North Belt Drive			
TYPE	ADD	POLL	REPLY
CB-PRO	001	00500	00500
ANALOG CHAN			
#	NAME	VALUE	
0	Average Current	250	
1	Peak Current	1580	
2	Average Voltage	990	
3	Gnd Flt Current	1.12	
4	Magnetic Setting	1800	
5	Thermal Setting	300	
6	Gnd Flt Setting	4.0	
7	Overload Time	540	
			EXIT

4. OPERATION(cont.)

4.2.10.5. DAD View CB-PRO Remote Digital Detail Screen

The DAD unit View CB-PRO Remote Digital Detail screen provides information about the CB-PRO remote and about the CB-PRO remote digital channel status. This information is detailed as follows:

- 1) Location label—The CB-PRO's location as defined in the Master Station configuration file.
- 2) Type—CB-PRO Circuit Breaker.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the CB-PRO's communication reliability.
- 5) Digital Channels—The name and status of the digital channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Digital Channel Detail			
First North Belt Drive			
TYPE	ADD	POLL	REPLY
CB-PRO	001	00500	00500
DIGITAL CHAN			
#	NAME	STAT	
0	Fuse A	OK	
1	Fuse B	OK	
2	Fuse C	OK	
3	Status	Closed	
4	Fault	No	
5	Key	Program	
6	Locked	No	
7	Digital Label	Off	
FAULT MESSAGE		NO BREAKER FAULT	EXIT

4. OPERATION(cont.)

4.2.10.6. DAD View CB-PRO Remote Control Detail Screen

The DAD unit View CB-PRO Remote Control Detail screen provides information about the CB-PRO remote and about the CB-PRO remote control channel status. This information is detailed as follows:

- 1) Location label—The CB-PRO's location as defined in the Master Station configuration file.
- 2) Type—CB-PRO Circuit Breaker.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the CB-PRO's communication reliability.
- 5) Control Channels—The name and status of the control channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Control Channel Detail			
First North Belt Drive			
TYPE	ADD	POLL	REPLY
CB-PRO	001	00500	00500

CONTROL CHAN		
#	NAME	STAT
0	E-Stop	Closed
1	Close Breaker	Released
2	Reset Fault	Off
3	Control Label	Off
4	Control Label	Off
5	Control Label	Off

EXIT

4. OPERATION(cont.)

4.2.10.7. DAD View MC-4020 Remote Analog Detail Screen

The DAD unit View MC-4020 Remote Analog Detail screen provides information about the MC-4020 remote and about the MC-4020 remote analog channel data. This information is detailed as follows:

- 1) Location label—The MC-4020's location as defined in the Master Station configuration file.
- 2) Type—MC-4020/IO Multi-Channel Remote and MC-4020 Multi-Channel Repeater.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the MC-4020's communication reliability.
- 5) Analog Channels—The name and value of the analog channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Analog Channel Detail			
First North Remote			
TYPE	ADD	POLL	REPLY
MC-4020	001	00500	00500
ANALOG CHAN			
#	NAME	VALUE	
0	Analog Label	xx.xx	
1	Analog Label	xx.xx	
2	Analog Label	xx.xx	
3	Analog Label	xx.xx	
4	Analog Label	xx.xx	
5	Analog Label	xx.xx	
6	Analog Label	xx.xx	
7	Analog Label	xx.xx	
ANALOG CHAN			
#	NAME	VALUE	
8	Analog Label	xx.xx	
9	Analog Label	xx.xx	
10	Analog Label	xx.xx	
11	Analog Label	xx.xx	
12	Analog Label	xx.xx	
13	Analog Label	xx.xx	
14	Analog Label	xx.xx	
15	Analog Label	xx.xx	
			EXIT

4. OPERATION(cont.)

4.2.10.8. DAD View MC-4020 Remote Digital Detail Screen

The DAD unit View MC-4020 Remote Digital Detail screen provides information about the MC-4020 remote and about the MC-4020 remote digital channel status. This information is detailed as follows:

- 1) Location label—The MC-4020's location as defined in the Master Station configuration file.
- 2) Type—MC-4020/IO Multi-Channel Remote and MC-4020 Multi-Channel Repeater.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the MC-4020's communication reliability.
- 5) Digital Channels—The name and status of the digital channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Digital Channel Detail			
First North Remote			
TYPE	ADD	POLL	REPLY
MC-4020	001	00500	00500
DIGITAL CHAN			
#	NAME	STAT	
0	Digital Label	Off	
1	Digital Label	Off	
2	Digital Label	Off	
3	Digital Label	Off	
4	Digital Label	Off	
5	Digital Label	Off	
6	Digital Label	Off	
7	Digital Label	Off	
DIGITAL CHAN			
#	NAME	STAT	
8	Digital Label	Off	
9	Digital Label	Off	
10	Digital Label	Off	
11	Digital Label	Off	
12	Digital Label	Off	
13	Digital Label	Off	
14	Digital Label	Off	
15	Digital Label	Off	
			EXIT

4. OPERATION(cont.)

4.2.10.9. DAD View MC-4020 and MC-4020I/O Remote Control Detail Screen

The DAD unit View MC-4020 Remote Control Detail screen provides information about the MC-4020 remote and about the MC-4020 remote control channel status. This information is detailed as follows:

- 1) Location label—The MC-4020's location as defined in the Master Station configuration file.
- 2) Type—MC-4020/IO Multi-Channel Remote and MC-4020 Multi-Channel Repeater.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the MC-4020's communication reliability.
- 4) Control Channels—The name and status of the control channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Control Channel Detail			
First North Remote			
TYPE	ADD	POLL	REPLY
MC-4020	001	00500	00500

CONTROL CHAN		
#	NAME	STAT
0	Control Label	Off
1	Control Label	Off
2	Control Label	Off
3	Control Label	Off
4	Control Label	Off
5	Control Label	Off

EXIT

4. OPERATION(cont.)

4.2.10.10. DAD View MC-4025 Remote Analog Detail Screen

The DAD unit View MC-4025 Remote Analog Detail screen provides information about the MC-4025 remote and about the MC-4025 remote analog channel data. This information is detailed as follows:

- 1) Location label—The MC-4025's location as defined in the Master Station configuration file.
- 2) Type—MC-4025 Line Powered Remote.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the MC-4025's communication reliability.
- 5) Analog Channels—The name and value of the analog channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Analog Channel Detail			
First North Belt Drive			
TYPE	ADD	POLL	REPLY
MC-4025	001	00500	00500
ANALOG CHAN			
#	NAME	VALUE	
0	CO LEVEL	4.77	
1	Motor A Current	245.39	
2	Motor B Current	245.39	
3	Motor C Current	245.39	
			EXIT

4. OPERATION(cont.)

4.2.10.11. DAD View MC-4025 Remote Digital Detail Screen

The DAD unit View MC-4025 Remote Digital Detail screen provides information about the MC-4025 remote and about the MC-4025 remote digital channel status. This information is detailed as follows:

- 1) Location label—The MC-4025's location as defined in the Master Station configuration file.
- 2) Type—MC-4025 Line Powered Remote.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the MC-4025's communication reliability.
- 5) Digital Channels—The name and status of the digital channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Digital Channel Detail			
First North Belt Drive			
TYPE	ADD	POLL	REPLY
MC-4025	001	00500	00500

DIGITAL CHAN		
#	NAME	STAT
0	Coupler Temp	OK
1	Belt Alignment	OK
2	Circuit Breaker	Closed
3	Ckt Brkr Fault	OK
4	115 VAC Loss	OK
5	Spill Switch	OK
6	Deluge	OK
7	Remote Switch	OK

EXIT

4. OPERATION(cont.)

4.2.10.12. DAD View MC-4025 Remote Control Detail Screen

The DAD unit View MC-4025 Remote Control Detail screen provides information about the MC-4025 remote and about the MC-4025 remote control channel status. This information is detailed as follows:

- 1) Location label—The MC-4025's location as defined in the Master Station configuration file.
- 2) Type—MC-4025 Line Powered Remote.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the MC-4025's communication reliability.
- 5) Control Channels—The name and status of the control channels, as labeled in the Master Station configuration file, are displayed.

To return to the View Remote Menu screen, press the Exit button until the display begins to rewrite.

DAD - Control Channel Detail			
First North Belt Drive			
TYPE	ADD	POLL	REPLY
MC-4025	001	00500	00500
CONTROL CHAN			
#	NAME	STAT	
0	Belt Control	Run	
1	Remote Control	Off	
			EXIT

4. OPERATION(cont.)

4.2.10.13. DAD View MC-4020/RS and MC-4040/S Smart Repeater Analog Detail Screen

The DAD unit View MC-4020/RS and MC-4040/S Remote Analog Detail screen provides information about the MC-4020 remote and about the MC-4020 remote analog channel data. This information is detailed as follows:

- 1) Location label—The MC-4020's location as defined in the Master Station configuration file.
- 2) Type—MC-4020/RS AC Line Powered Smart Repeater and MC-4040/S DC Line Powered Smart Repeater.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the MC-4020's communication reliability.
- 5) Analog Channels—The name and value of the analog channels, as labeled in the Master Station configuration file, are displayed.

DAD - Analog Channel Detail					
First North Smart Repeater					
TYPE	ADD	POLL	REPLY		
MC-4020/RS	001	00500	00500		
ANALOG CHAN			ANALOG CHAN		
#	NAME	VALUE	#	NAME	VALUE
0	Port 1 Bias	0.30	8	Port 3 Errors	0.00
1	Port 1 Level	2.40	9	Spare 1	0.02
2	Port 2 Bias	0.30	10	Spare 2	0.02
3	Port 2 Level	2.40	11	Spare 3	0.02
4	Port 3 Bias	0.30	12	Power Supply	19.2
5	Port 3 Level	2.40	13	Port 1 Draw	20.6
6	Port 1 Errors	0.00	14	Port 2 Draw	39.4
7	Port 2 Errors	0.00	15	Port 3 Draw	15.9
					EXIT

4. OPERATION(cont.)

4.2.10.14. DAD View MC-4020/RS and MC-4040/S Smart Repeater Digital Detail Screen

The DAD unit View MC-4020/RS and MC-4040/S Remote Digital Detail screen provides information about the MC-4020 remote and about the MC-4020 remote digital channel status. This information is detailed as follows:

- 1) Location label—The MC-4020's location as defined in the Master Station configuration file.
- 2) Type—MC-4020/RS AC Line Powered Smart Repeater and MC-4040/S DC Line Powered Smart Repeater.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the MC-4025's communication reliability.
- 5) Digital Channels—The name and status of the digital channels, as labeled in the Master Station configuration file, are displayed.

DAD - Digital Channel Detail			
First North Smart Repeater			
TYPE	ADD	POLL	REPLY
MC-4020/RS	001	00500	00500

DIGITAL CHAN			DIGITAL CHAN		
#	NAME	STAT	#	NAME	STAT
0	Port 1 Open	No	8	Baud Rate Switch	On
1	Port 1 Short	No	9	Kill Switch	On
2	Port 2 Open	No	10	I/O Board Switch	Off
3	Port 2 Short	No	11	Spare Digital	Off
4	Port 3 Open	No	12	Spare Digital	Off
5	Port 3 Short	No	13	Spare Digital	Off
6	I/O Comm	No	14	Spare Digital	Off
7	AC Power	On	15	Spare Digital	Off

	EXIT
--	-------------

4. OPERATION(cont.)

4.2.10.15. DAD View MC-4020/RS and MC-4040/S Smart Repeater Control Detail Screen

The DAD unit View MC-4020/RS and MC-4040/S Remote Control Detail screen provides information about the MC-4020 remote and about the MC-4020 remote control channel status. This information is detailed as follows:

- 1) Location label—The MC-4020's location as defined in the Master Station configuration file.
- 2) 2) Type—MC-4020/RS AC Line Powered Smart Repeater and MC-4040/S DC Line Powered Smart Repeater.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the MC-4020's communication reliability.
- 5) Control Channels—The name and status of the control channels, as labeled in the Master Station configuration file, are displayed.

DAD - Control Channel Detail			
First North Smart Repeater			
TYPE	ADD	POLL	REPLY
MC-4020/RS	001	00500	00500

CONTROL CHAN		
#	NAME	STAT
0	Port 1 Enable	Enable
1	Port 1 Power	On
2	Port 2 Enable	Enable
3	Port 2 Power	On
4	Port 3 Enable	Enable
5	Remote Kill	On

EXIT

4. OPERATION(cont.)

4.2.10.16. DAD View MC-4020/R and MC-4040 Smart Repeater Analog Detail Screen

The DAD unit View MC-4020/R and MC-4040 Remote Analog Detail screen provides information about the MC-4020 remote and about the MC-4020 remote analog channel data. This information is detailed as follows:

- 1) Location label—The MC-4020's location as defined in the Master Station configuration file.
- 2) Type—MC-4020/RSAC Line Powered Smart Repeater and MC-4040/DC Line Powered Smart Repeater.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the MC-4020's communication reliability.
- 5) Analog Channels—The name and value of the analog channels, as labeled in the Master Station configuration file, are displayed.

DAD - Analog Channel Detail			
First North Belt Drive			
TYPE	ADD	POLL	REPLY
MC-4020-R	001	00500	00500
ANALOG CHAN			
#	NAME	VALUE	
0	CO LEVEL	4.77	
1	Motor A Current	245.39	
			EXIT

4. OPERATION(cont.)

4.2.10.17. DAD View MC-4020/R and MC-4040 Smart Repeater Control Detail Screen

The DAD unit View MC-4020/R and MC-4040 Remote Control Detail screen provides information about the MC-4020 remote and about the MC-4020 remote control channel status. This information is detailed as follows:

- 1) Location label—The MC-4020's location as defined in the Master Station configuration file.
- 2) 2) Type—MC-4020/R AC Line Powered Smart Repeater and MC-4040 DC Line Powered Smart Repeater.
- 3) Address—001 through 99.
- 4) Poll/Reply—As the screen is first written, the number of times the remote has been Polled counter is reset and then is incremented along with the number of remote Replies. This informs the user of the MC-4020's communication reliability.
- 5) Control Channels—The name and status of the control channels, as labeled in the Master Station configuration file, are displayed.

DAD - Control Channel Detail			
First North Belt Drive			
TYPE	ADD	POLL	REPLY
MC-4020-R	001	00500	00500

CONTROL CHAN		
#	NAME	STAT
0	Belt Control	Run
1	Remote Control	Off
5	Remote Kill	On

EXIT

4. OPERATION(cont.)

4.2.11. DAD Poll Sensor Screen

In the “View Sensor” mode, the DAD unit relies on the Master Station to “poll” or request information from the sensor or remote. In the “Poll Sensor” mode, the DAD unit “polls” the sensors in the same manner as the Master Station would poll the sensors. Using the DAD unit and the Poll Sensor Screen as a troubleshooting device, monitoring system maintenance personnel can isolate communication line problems to a particular part of the mine. The user disconnects the problem area communication Comm + and Comm -lines and connects the DAD unit J1 connector Comm + and Comm—to the “inby” sensors and remotes. Power the the “inby” devices is still provided by the Comm +28 VDC line. The DAD unit “polls” the “inby” devices to establish proper operation of that particular section of the monitoring system.

The DAD unit Poll Sensor menu screen allows the user to select the address of sensor/s to be polled and then “enable” communications (poll) with those sensors. The user then observes the performance of the selected sensors using a block or page of 8 sensors beginning with address 1. The sensor location , address, Comm Enabled(YS/NO), Poll or communication Status(OK/NO), and sensor value are displayed.

Use the Page Up/Down buttons to view the next or previous page of 8 sensors.

To “Poll” a particular sensor whose address is on the page, us the **CURSOR UP/DN** buttons to move the cursor to the desired address. Press the **POLL** button to toggle the ENAB area from NO to YES. Observe that the Poll area for the selected address also changes from NO to YES and the sensor VALUE begins to update. If the POLL area does not indicate YES, the sensor is not responding the DAD unit’s request for data.

To “Poll” a sensor address **not** on the page, move the cursor up/down to a new line and use the **0** thru **9** buttons to enter the desired address. After the entered address appears on the SENSOR ADDRESS line, Press the **ADDRESS** button. The desired address will now appear on the line adjacent to the cursor position. Press the **POLL** button to begin communicating with the sensor.

To view more information about a particular sensor, use the Cursor Up/Down buttons to move the cursor to the desired sensor address. Press the Detail button until the screen begins to rewrite.

See section 4.2.9.1 for a description of the MC-4110 Sensor Detail Screen.

See section 4.2.9.2 for a description of the MC-4210 Sensor Detail Screen.

4. OPERATION(cont.)

4.2.11. DAD Poll Sensor Screen

DAD - Poll Sensor

LOCATION	AD	EN	CM	VALUE	
SENSOR LOCATION	001	YS	OK	0.52	PPM
SENSOR LOCATION	002	YS	OK	0.52	PPM
SENSOR LOCATION	003	YS	OK	0.52	PPM
SENSOR LOCATION	004	YS	OK	0.52	PPM
SENSOR LOCATION	005	YS	OK	0.52	PPM
SENSOR LOCATION	006	YS	OK	0.52	PPM
SENSOR LOCATION	007	YS	OK	0.52	PPM
SENSOR LOCATION	008	YS	OK	0.52	PPM

cursor ———▶

1) PAG UP/DN 3) ENTR ADD
2) CUR UP/DN 4) TOGL POLL

SENSOR ADDRESS 12

0	1	2	3	4
5	6	7	8	9

EXIT	ADDRESS	POLL
------	---------	------

DETAIL	
PAG 00	UP DN
CUR	UP DN

4. OPERATION(cont.)

4.2.12. DAD Poll Remote Screen

CAUTION:

The user must be aware that in polling a remote control commands are sent that may perform some undesired control action, such as start/stopping belts.

In the “View Remote” mode, the DAD unit relies on the Master Station to “poll” or request information from the sensor or remote. In the “Poll Remote” mode, the DAD unit “polls” the remote in the same manner as the Master Station would poll the remote. Using the DAD unit and the Poll Remote Screen as a troubleshooting device, monitoring system maintenance personnel can isolate communication line problems to a particular part of the mine. The user disconnects the problem area communication Comm + and Comm - lines and connects the DAD unit J1 connector Comm + and Comm—to the “inby” sensors and remotes. Power to the “inby” devices is still provided by the Comm +28 VDC line. The DAD unit “polls” the “inby” devices to establish proper operation of that particular section of the monitoring system.

The DAD unit Poll Remote menu screen allows the user to select the address of remotes/s to be polled and then “enable” communications (poll) with those remotes. The user then observes the performance of the selected remotes using a block or page of 5 remotes beginning with address 1. The remote type, remote location, address, Comm Enabled(YS/NO) and Poll or communication Status(OK/NO) are displayed.

Use the Page Up/Down buttons to view the next or previous page of 5 remotes.

To “Poll” a particular remote whose address is on the page, use the **CURSOR UP/DN** buttons to move the cursor to the desired address. Press the **POLL** button to toggle the ENAB area from NO to YES. Observe that the Poll area for the selected address also changes from NO to YES. If the POLL area does not indicate YES, the remote is not responding the DAD unit’s request for data.

To “Poll” a remote address **not** on the page, move the cursor up/down to a new line and use the **0** thru **9** buttons to enter the desired address. After the entered address appears on the REMOTE ADDRESS line, Press the **ADDRESS** button. The desired address will now appear on the line adjacent to the cursor position. Press the **POLL** button to begin communicating with the remote.

4. OPERATION(cont.)

4.2.12. DAD Poll Remote Screen

To view more information about a particular remote, use the Cursor Up/Down buttons to move the cursor to the desired remote address.

Press the Analog button to view Analog Channel detail information.

Press the Digital button to view Digital Channel detail information.

Press the Control button to view Control Channel detail information.

See section 4.2.10.1 through 4.2.10.3 for a description of the BM-4000 Detail Screens.

See section 4.2.10.4 through 4.2.10.6 for a description of the CB-PRO Detail Screens.

See section 4.2.10.7 through 4.2.10.9 for a description of the MC-4020 Detail Screens.

See section 4.2.10.10 through 4.2.10.12 for a description of the MC-4025 Detail Screens.

See section 4.2.10.13 through 4.2.10.15 for a description of the MC-4020/RS and MC-4040/S Detail Screens.

See section 4.2.10.16 through 4.2.10.17 for a description of the MC-4020/R and MC-4040 Detail Screens.

DAD - Poll Remote

TYPE	LOCATION	AD	EN	CM
BM-4000	REMOTE LOCATION	001	YS	OK
MC-4025	REMOTE LOCATION	002	YS	OK
MC-4020/RS	REMOTE LOCATION	003	YS	OK
BM-4000	REMOTE LOCATION	004	YS	OK
BM-4000	REMOTE LOCATION	005	YS	OK

cursor →

1) PAG UP/DN 3) ENTR ADD
 2) CUR UP/DN 4) TOGL POLL

REMOTE ADDRESS 0 —

0	1	2	3	4	PAG 00	UP	DN
5	6	7	8	9		UP	DN

EXIT	ADDRESS	POLL	CUR	UP	DN
------	---------	------	-----	----	----

ANALOG
DIGITAL
CONTRL

5. INSTALLATION

The DAD unit is pre-assembled and ready for use when installed using Figure 2, Data Acquisition Display Connection Diagram.

5.1. Configuration

Before the DAD unit may be used, the mine monitoring system configuration must be download to the DAD unit. This allows the DAD unit to properly associate each sensor or remote address with the Master Station configuration data. See section 4.2.6..

5.2. 115 VAC Power

Whether the DAD unit is used in the “Listen” or “Poll” mode, 115 VAC power should be used if available. This assures the battery will always be charged. Connect 115 VAC Line, Line Return and Frame Ground to the DAD 253-0356A PC Board connector J2.

5.3. 28 VDC Communications Line Power

When 115 VAC is not available, connect the communications line +28 VDC wire to the DAD 253-0356A PC Board connector J1 pin 1. Connect the communications line GND wire to the DAD 253-0356A PC Board connector J1 pin 2. Be aware that the DC current drain from the communications line is 50 milliamperes. This will re-charge the battery when the DAD unit is in the “Sleep” mode. The unit enters the “Sleep” after 4 minutes of LCD Touch Screen Keypad Display inactivity.

5.4. Communications Data Line

Connect the communications line + Comm wire to the DAD 253-0356A PC Board connector J1 pin 3. Connect the communications line - Comm wire to the DAD 253-0356A PC Board connector J1 pin 4.

5.5. “Listen” Mode Comm Line Termination

Care should be taken to properly terminate the communication data line depending upon how the DAD unit is being used. This is accomplished by placing the DS1 switches in the proper position. In the “Listen” mode, if the DAD unit is at the end of a communications line, place DS1 position 2 to ON and DS1 positions 1, 3 to OFF. Otherwise, when in the “Listen” mode, place all DS1 switch positions to OFF.

5.6. “Poll” Mode Comm Line Termination and Bias

Care should be taken to properly terminate and bias the communication data line when in the “Poll” mode. This is accomplished by placing all the DS1 switches in the ON position.

5.7. Wake-Up Switch

After the DAD unit has been installed, press and hold the Wake-Up switch (located on the side of the unit), until the LCD display is illuminated.

6. USING PORTABLE DAD

The DAD hardware has been packaged in a rugged enclosure so that it may be easily taken inside the mine to troubleshoot the mine monitoring system. The user may “**View**” the same information displayed on the Mine Monitoring System Master Station by connecting to the monitoring system data line. The user may also “**Poll**” a monitoring system branch line in which it is suspected a problem exists. The four pin panel mount connector has a +28 VDC and a GND connection. These are **NOT** to be used for providing 28 VDC power to sensors or remotes. These connections are inputs and are to be used to monitor the DC voltage provided by monitor system remotes.

6.1. Power ON Switch

A Power ON switch has been added to the panel to interrupt AC and battery backup power. Use AC power when it is available. Otherwise, the unit will operate continuously for four hours before having to recharge the battery. To recharge the battery, connect 115 VAC to the unit and place the Power switch to ON.

6.2. Connections at Sensors/Remotes to View Sensor or Remote Data

When it is necessary to connect to the communications data line inside sensors (and some remotes) to “**View**” sensor and/or remote status information, use alligator clips or J-hooks (attached to wires) to connect the Comm (+) and Comm (–) pins of the four pin panel mount connector to the sensor/remote terminal block communications data line Comm (+) and Comm (–) wires. Use alligator clips or J-hooks (attached to wires) to connect the +28 VDC and GND of the four pin panel mount connector to the sensor/remote terminal block communications data line +DC and GND wires.

6.3. Connections at the Input of a Repeater to Poll Multiple Branches

The Portable DAD may be used to “**Poll**” multiple communication line branches by connecting the Comm (+) and Comm (–) pins of the four pin panel mount connector at the **input** side of the repeater. Be sure to remove the mine monitoring communications lines before connecting the DAD communication lines. Use the supplied jumper cable to make connections to the repeater input.

6.4. Connections at the Output of a Repeater to Poll a Single Branch

The Portable DAD may be used to “**Poll**” a single communication line branch by removing the desired **output** port plug from the repeater connector and connecting the Comm (+) and Comm (–) pins of the four pin panel mount connector to the output port plug Comm (+) and Comm (–) pins. Use the supplied jumper cable to make connections to the output port plug.

6.5. Connections at Sensors/Remotes to Poll Sensors or Remotes

When it is necessary to connect to the communications data line inside sensors (and some remotes) to “**Poll**” sensors and/or remotes, use alligator clips or J-hooks (attached to wires) to connect the Comm (+) and Comm (–) pins of the four pin panel mount connector to the sensor/remote terminal block communications data line Comm (+) and Comm (–) wires. .

7. TROUBLESHOOTING

Use the table below as a aid in determining the cause of problems.

SYMPTOM	POSSIBLE CAUSE
LCD Display will not illuminate.	<ol style="list-style-type: none">1) Lost 115 VAC power at 253-0356A J2.2) Blown F1 fuse.3) Lost +28 VDC power at 253-0356A J1.4) Low battery voltage at J3.5) Loose J5 or J11 connector.6) Defective Wake-Up Switch.7) Defective LCD Display.8) Defective 253-0356A PC Board.
DAD does not update sensor or remote data.	<ol style="list-style-type: none">1) Loose Comm Lines at J1.2) Blown F2 and/or F3 fuse.3) Incorrect DS1 switch positions.4) Configuration not downloaded from monitor system Master Station.5) Loose J5 or J11 connector.6) Communications line not terminated or biased properly7) Defective LCD Display.8) Defective 253-0356A PC Board.

8. SPARE PARTS

Amr Part Number	Description
253-0356A	DAD PC Board Assembly
275-0016	12 Volt, 1.3 Amp Hour Battery
195-0214	34 Conductor Ribbon Cable Assembly
195-0215	Display Interface Cable Assembly
310-0103	LCD Touch Screen Display

DAD MENU TREE

- 1 ENTRY MENU**
- 2 MAIN MENU**
- 3 1) POLL SENSOR**
- 4 1) MC-4110 DETAIL**
- 5 2) MC-4210 DETAIL**
- 6 2) POLL REMOTE**
- 7 1) BM-4000**
- 8 1) ANALOG DETAIL**
- 9 2) DIGITAL DETAIL**
- 10 3) CONTROL DETAIL**
- 11 2) CB-PRO**
- 12 1) ANALOG DETAIL**
- 13 2) DIGITAL DETAIL**
- 14 3) CONTROL DETAIL**
- 15 3) MC-4020**
- 16 1) ANALOG DETAIL**
- 17 2) DIGITAL DETAIL**
- 18 3) CONTROL DETAIL**
- 19 4) MC-4025**
- 20 1) ANALOG DETAIL**
- 21 2) DIGITAL DETAIL**
- 22 3) CONTROL DETAIL**
- 23 5) MC-4020/RS AND 4040/S**
- 24 1) ANALOG DETAIL**
- 25 2) DIGITAL DETAIL**
- 26 3) CONTROL DETAIL**
- 27 6) MC-4020/R AND 4040**
- 28 1) ANALOG DETAIL**
- 29 2) DIGITAL DETAIL**
- 30 3) CONTROL DETAIL**

31	3) SET CLOCK
32	4) SET CONTRAST
33	5) SUPPORT
34	6) VU SENSOR
35	1) MC-4110 DETAIL
36	2) MC-4210 DETAIL
37	7) VU REMOTE
38	1) BM-4000
39	1) ANALOG DETAIL
40	2) DIGITAL DETAIL
41	3) CONTROL DETAIL
42	2) CB-PRO
43	1) ANALOG DETAIL
44	2) DIGITAL DETAIL
45	3) CONTROL DETAIL
46	3) MC-4020
47	1) ANALOG DETAIL
48	2) DIGITAL DETAIL
49	3) CONTROL DETAIL
50	4) MC-4025
51	1) ANALOG DETAIL
52	2) DIGITAL DETAIL
53	3) CONTROL DETAIL
54	5) MC-4020/RS AND 4040/S
55	1) ANALOG DETAIL
56	2) DIGITAL DETAIL
57	3) CONTROL DETAIL
58	6) MC-4020/R AND 4040
59	1) ANALOG DETAIL
60	2) DIGITAL DETAIL
61	3) CONTROL DETAIL
62	8) VU SENSOR ALARMS
63	9) VU COM LINE
64	10) CONFIGURE