

Production Board (AYM Manufacturing) User Manual

Title Page

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1. Introduction

1.1. Scope

The scope of this document covers the operation and maintenance of the Production Board Display System for AYM Manufacturing.

1.2. Purpose

The purpose of the document is to provide the relevant information to enable the user to install, operate and maintain the Production Board correctly.

1.3. System

The system consists of two back-to-back Boards and a single Production Board connected to a control PC on an existing local Ethernet network via an RJ45 connection. All characters on the Display are 3" (75mm) high and use super-bright red LED technology.

The primary function of the Board is to show real time production information obtained from the production line using volt-free pulses.

Each Board consists of two sections:

DATABOARD – this is the TARGET ACTUAL section of the Display that monitors the production output . Values are shown in each of the relevant 6 character fields for the following:

- *Shift Goal*, cumulative target value for current shift
- *S / S Units*, number of units that have passed quality check
- *Build Pace*, cumulative moving target set by TAKT time
- *Actual Build*, cumulative total of units produced during the shift
- *+ / -* , Build Pace value minus the Actual Build value
- *Efficiency*, mathematical formula calculated by dividing the Actual Build value by the Build Pace value

DATALINE – this is the 30 character scrolling section at the bottom of the Display and is used to show general information such as company notices, safety messages etc.

The Board is operated using the network version of *ProdnSDS*, a windows based software package. An internal network card (SANSPEOPLE EtherPAd Assy) is installed in the Display enabling the Display to connect to the customers Local Area Network (LAN). The Display becomes part of the network similar to the PCs and printers and must be given an IP address.

A four color (Red, Amber, Green and Blue) stack-light is fitted to the Display that shows production progress by illuminating one of the four lights. This depends on percentage values set in the schedule file. The blue light illuminates when the production line pauses between breaks or shift change-overs.

2. Installation

2.1. Unpacking

Carefully remove the items from their package and store the packaging safely. After unpacking, inspect the contents for any damage that may have occurred during shipment.

2.2. Hardware

The Display Board(s) should be located in a position where there is unrestricted viewing of the front face of the Board. Also locations where the Board is subject to bright lights or direct sunlight should be avoided. Mount the Board securely and connect the cables as shown in the figure below.

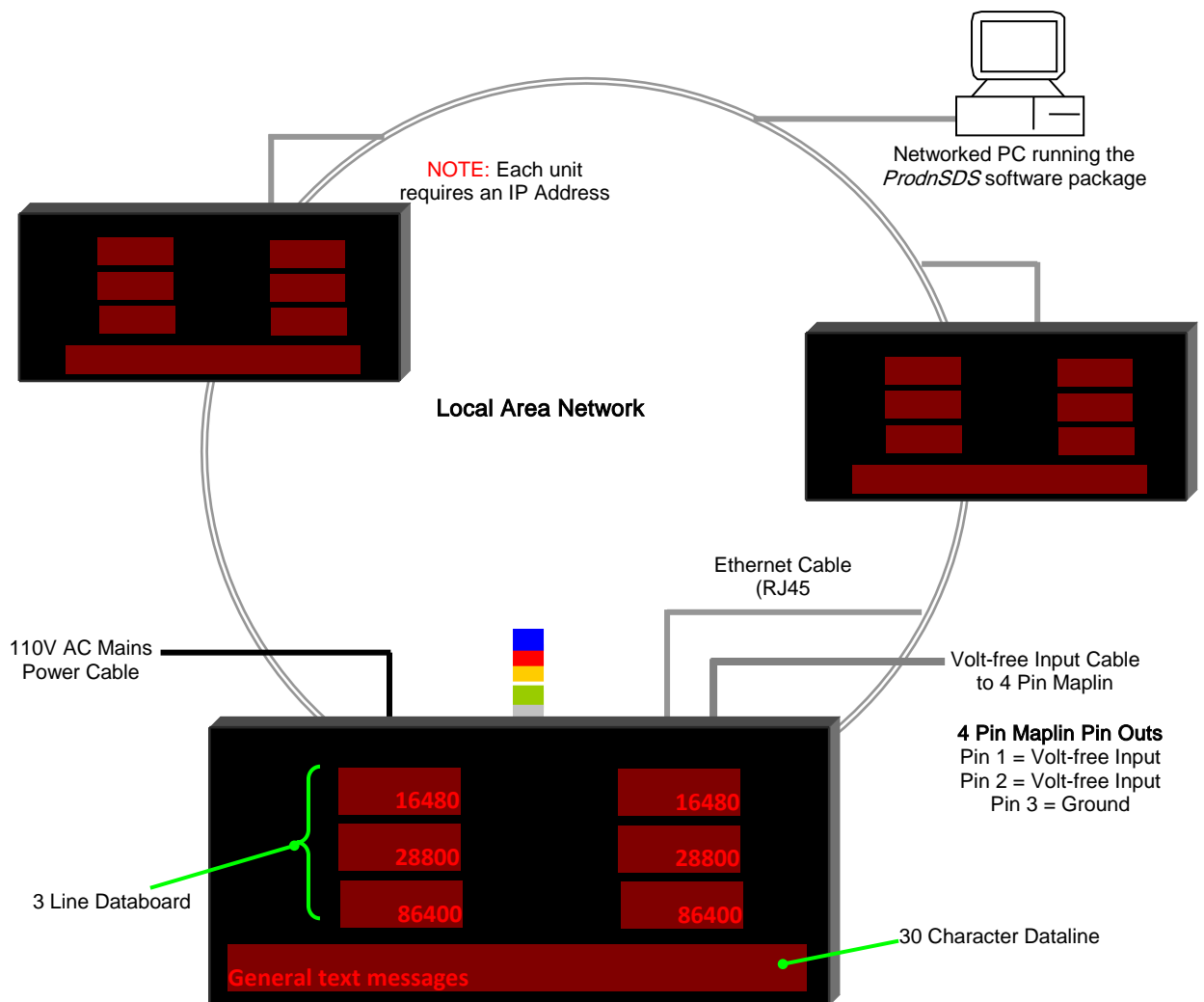


Figure 2.1 – System Configuration.

2.3. Software

The networked version of the *ProdnSDS* software package is supplied on CD-ROM. To install the software, do the following steps:

1. Insert the CD into your CD-ROM tray.
2. Where *Autorun* is enabled, the installation screen appears as below.

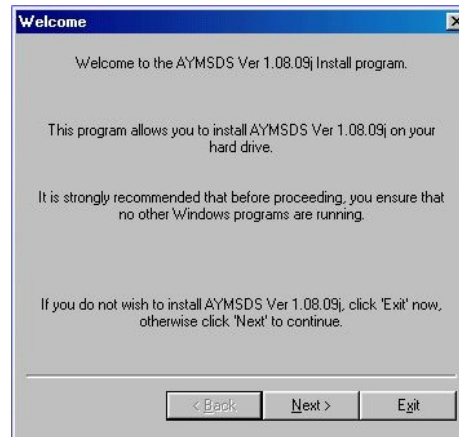


Figure 2.2 – Introduction Screen for CD-ROM Installation.

3. Click on the *Next >* button to begin the installation and follow the on-screen instructions.
4. When the process is complete, all files are stored in the *C:\ProdnSDS* folder unless the destination folder has been changed.

If the *Autorun* feature on your PC is disabled or you are installing the software from a floppy disk, click the **Start** button, then select **Settings\Control Panel**. Double-click the **Add/Remove Programs** icon and follow the instructions shown on the screen.

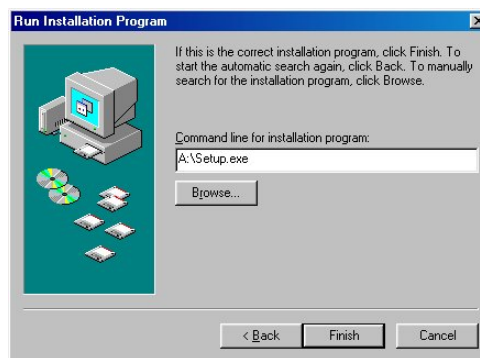


Figure 2.3 – Installation Screen.

Add *ProdnSDS* to the Start menu or your Desktop by creating a short-cut as described in your Windows User Manual. The executable file to run the software package is as follows:

AYM ProdnSDS = C:\ProdnSDS\AYMSDS.EXE

ProdnSDS.exe and all relevant files should now be installed in the *C:\ProdnSDS* directory.

3. Setting Up the Display

To set up the Display, the following is required:

- Three vacant nodes on the network
- Three static IP Addresses from the Network Administrator
- The EtherPad Network card setup program, PADConfig.exe, found on the software disk
- NetSDS.ini file, used to manually enter the IP addresses

All files should be located in the *C:\ProdnSDS* folder/directory

The UDP/IP configuration utility (PADConfig.exe) is a Windows-based application that allows the entire EtherPAD configuration to be set up and viewed via a graphic user interface (GUI).

3.1. Configuring the SANSPEOPLE Network Card

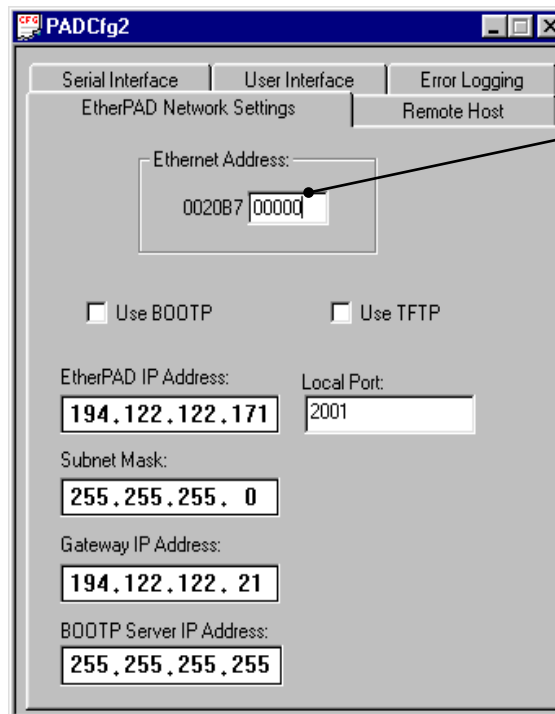
Note: To use the Display on your local network, the Display must first be assigned two *STATIC* IP Addresses, one for each network card. These Addresses should be assigned by your IT network administrator. Consult your Network Administrator before doing the following steps.

Step 1

Locate the PADConfig.exe program in the ProdnSDS directory.

Step 2


Double-click on PADConfig.exe to run the program. The *PADCfg1 Setup Box* opens.



Last 6 characters of EtherPAD Ethernet Address appears when network is scanned.

Figure 3.1 – EtherPad Setup Box.

Step 3

Click on the  button to scan the local network for the EtherPAD Ethernet devices and addresses. Make sure the Display is connected to a node on the network.

Step 4

The *Scan Network for EtherPAD* dialog box opens and shows all EtherPAD devices that are connected to the network. As you have not yet assigned an IP Address to the Display, only the Ethernet Address will be shown. Click on the Ethernet Address and click on the 'Retrieve' button.

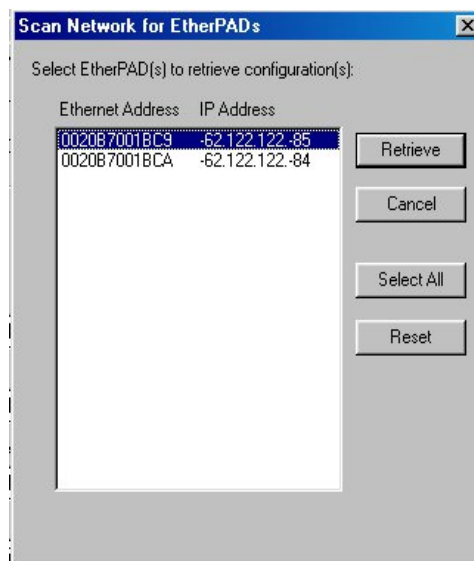


Figure 3.2 – EtherPad Devices on Network.

Step 5

In the new *PADCfg* window, enter the EtherPad IP Address, Subnet Mask and Gateway IP Address, refer to *Fig 3.1*.


Step 6

Enter *2001* in the *Local Port* text box.

Step 7

Click on the *Serial Interface* tab and set the *Serial Device Baud Rate* to *9600*.


Step 8

Click on the  button to send the settings to the device. Enter the password **XXX** in the *Password* Dialog Box and click on the *OK* button.

Repeat steps 3-8 for each EtherPAD device.

Step 9

Click on the *X* button to close down the program. Click on the *No* button on the *PADConfig* dialog box. It is not necessary to save the changes once the IP Address details are sent to the Display.

To retrieve configuration data from your EtherPAD, type in the EtherPAD MAC (Hardware Address) in the Ethernet Address box and click on the  button.

3.2. NetSDS.INI Set-up

The Display now has static IP addresses assigned to its EtherPAD devices. The IP addresses must be listed in the NetSDS.ini file under the section titled [NetPrinter], with each entry connection titled '*Net IP Address 1=*' followed by the assigned IP address. For example:

```
[NetPrinter]
```

```
NetIPAdd1 = 194.122.122.140 (IP address for the Board No. 1)
```

```
NetIPAdd2 = 194.122.122.141 (IP address for the Board No. 2) etc
```

Close the NetSDS.ini file and save the settings.

4. ProdnSDS Software

The networked version *ProdnSDS* software is a user interactive software package designed to send and receive real time production information to the Display Board. It contains features such as:

- Shows current shift goal and actual values
- Calculates and displays efficiencies in percentages
- Changeable daily shift start, stop times and build pace TAKT settings by way of daily schedule files
- Incorporates 30 character Message Editor for Dataline

A Volt-free pulse is received via the Parallel Interface installed in the Display and increments the Shift *ACTUAL* value by 1. When the Parallel Interface increments the *ACTUAL* values, the software calculates and sends a corresponding efficiency value on the Display.

4.1. Getting Started

Use the *ProdnSDS* software to edit schedule files and send the information to the Display Board. Double-click on the *ProdnSDS* icon to run the program, *ProdnSDS.exe*. The software is password protected. When the Password dialog box appears, do the following:

1. For the *Username*, click on *DEFAULT*
2. For the *Password*, enter **T-SET** and press the *Enter* key.



Figure 4.1 - Password Dialog Box.

As the Displays are on a network, authorisation and privileges may be given to users to view, edit or send messages to the Display.

4.2. Setting up Users and Authorisation

The next step is to set up a list of Users and give the required level of access to each user.

To setup a list of NetSDS usernames and passwords click on the

'System|Setup|Authorisation' menu option and setup a list of up to 10 usernames and passwords. Use the PREV/NEXT buttons to scroll through the list of authorised users.

For 'Privileged/Unprivileged' users, you can define what Displays or Groups they have access to by highlighting these symbols in the 'Access to:' list provided. However this list must be edited again or at least double-checked if you add or delete a Display or Group.

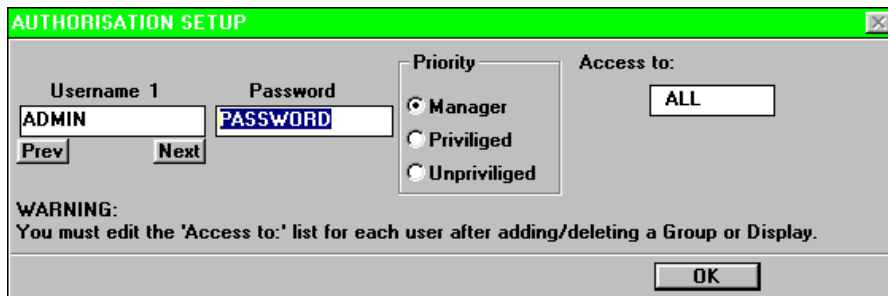


Figure 4.2 - Authorisation Setup Dialog Box.

- Note:**
- If you set the first Username to "AUTO", NetSDS will run without the Authorisation Check dialog.
 - You can append the Username and Password to the command line
Eg. NetSDS Username,Password
 - Make sure there is only one Username and Password setup, otherwise the 'Polling all users dialog!' will appear.

PRIORITIES:

Manager = Level 3 access,

Privileged = Level 2 access, change messages

Unprivileged = Level 1 access, view messages.

STATUS: This facility allows you to check who is currently using(ONLINE) or not using(OFFLINE) the software. To check the status of NetSDS users, click on the 'System|Setup|Users' menu option.

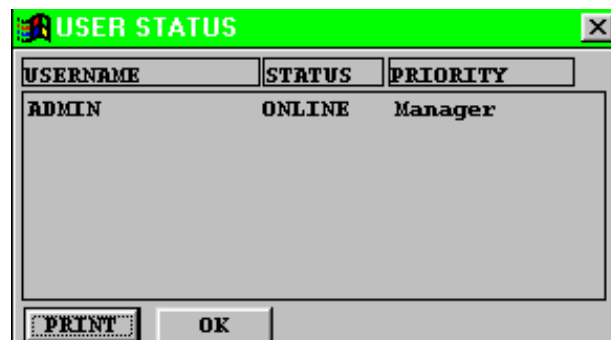


Figure 4.3 - User Status Dialog Box.

4.3. The User Interface

Double-click on the *ProdnSDS* icon to run the program, *ProdnSDS.exe*. The User Interface consists of the Menu Bar, a layout of the three Production Displays together with the various buttons and data fields that control the Displays.

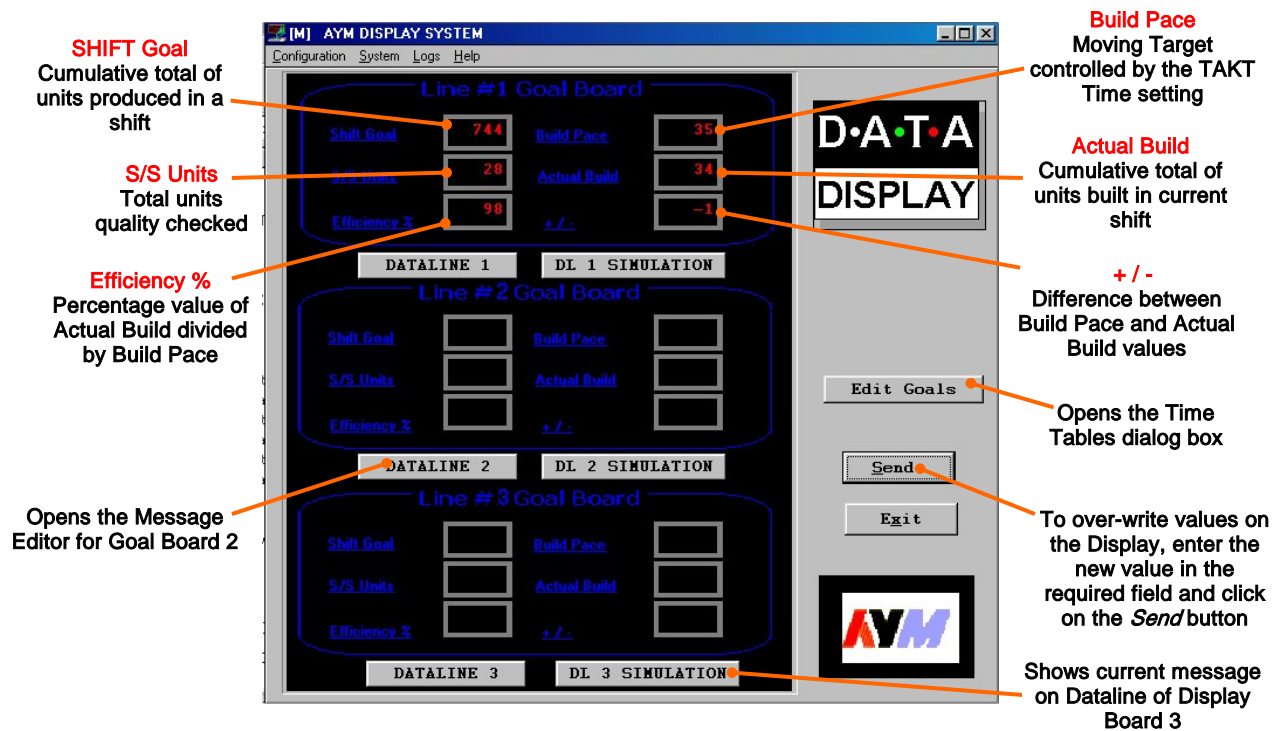


Figure 4.4 - ProdnSDS User Interface.

To operate the Display manually, enter the values in the relevant fields and click on the *Send* button. Its important to note that because the software is polling the Display every 30 seconds, the user may have to click the *Send* button again to update the Display.

Each Production Display has six fields with six characters that makes up the Databoard section of the Display. The fields are as follows:

Shift Goal: This is the total number of units to be built in a shift time period, e.g. 8 Hours, sometimes referred to as the TARGET. The value is taken from the schedule file and is a total of all units for all jobs to be produced in that shift.

S/S Units: This is the total number of units that has passed the quality check, controlled by a pulse via the Parallel Interface.

Efficiency %: This is a mathematical formula calculated by dividing the Actual Build value by the Build Pace value and multiplied by 100. E.g. If Actual Build value = 60 and Build Pace value = 64 then the efficiency value is:

$$\frac{60}{64} \times 100 = 94\%$$

Build Pace: The Build Pace is a moving target controlled by the TAKT Time set for each job in the software. E.g. If the TAKT Time is set to 30, the Build Pace value increments by one every 30 seconds. This value accumulates for all jobs within a shift and may be reset manually via the User Interface. NOTE: 30 seconds is the minimum TAKT Time setting allowed due to the poll rate between the software and the Display.

Actual Build: This is the total number of units currently built on the production line for each job and cumulates through out the shift. The Parallel Interface inside the Display increments the value by one each time it receives a volt-free pulse from the production line.

+ / -: This value is the difference between the Build Pace value and the Actual Build value. E.g. Build Pace = 34, Actual Build = 32, + / - value = -2

4.4. Editing the Schedule File

To achieve an accurate production calculation, a schedule file is necessary to provide the software with a detailed listing of:

- Shift Start and Stop times
- Break Times
- Job Start Times
- Goal values for each Job
- TAKT Settings in seconds, e.g. 30 = 30 seconds

There are six files in total, three that contain the details for the current days production and three that contain the details for the next days production.

To edit a schedule file, do the following steps:

1. Click on the *Edit Goals* button on the User Interface.
2. This opens the *Time Tables* dialog box that lists the six schedule files in the *Table names* field.
3. Click on a schedule file name and click on the *EDIT* button.

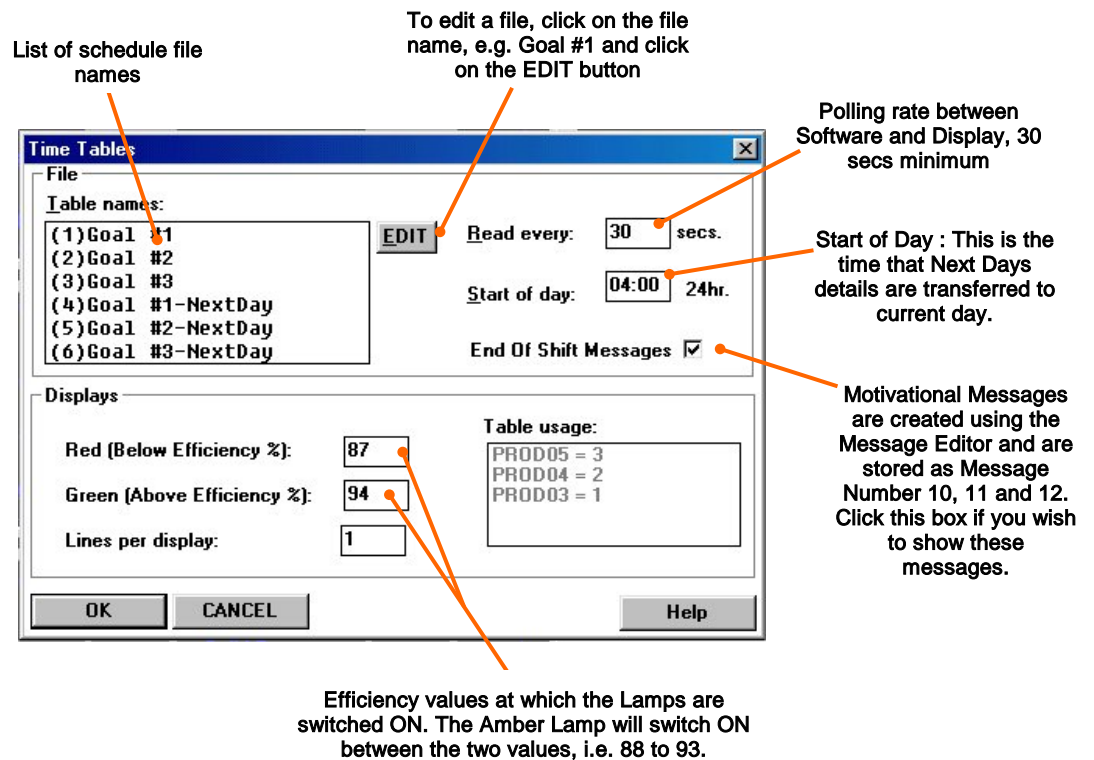


Figure 4.5 – Driver File Setup.

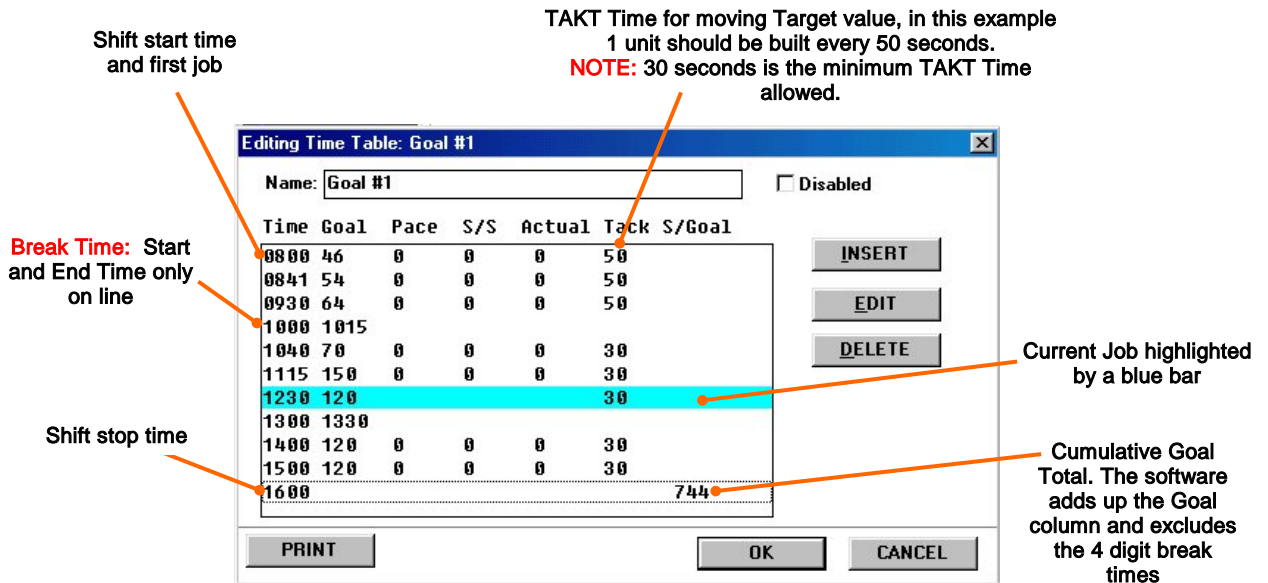


Figure 4.6 – Schedule File for Display Goal#1.

The schedule file contains the list of Start Times, Goal values and TAKT Time setting for each job in the shift. Up to 12 job entries may be listed in a single shift. The current job is highlighted by a blue bar.

The three buttons, *INSERT*, *EDIT* or *DELETE* allow the user to add a job, edit a job or delete a job.

- Click on a line and click on the *INSERT* button to add a new job. Enter the Start time for the Job, the Goal value and the TAKT Time setting.

NOTE: Build Pace is calculated by the software.

S / S Units and Actual Build values are incremented from pulses received from the PLC via the 4-pin Maplin on top of the Display.

Should the values of these three fields need adjusting, enter the values here and the software will add them to the current values. E.g If the S/S Units value is out by 2 on the Display, enter 2 in the S/S Units: field. A value of 2 will now be added to the S/S Units value on the Display.

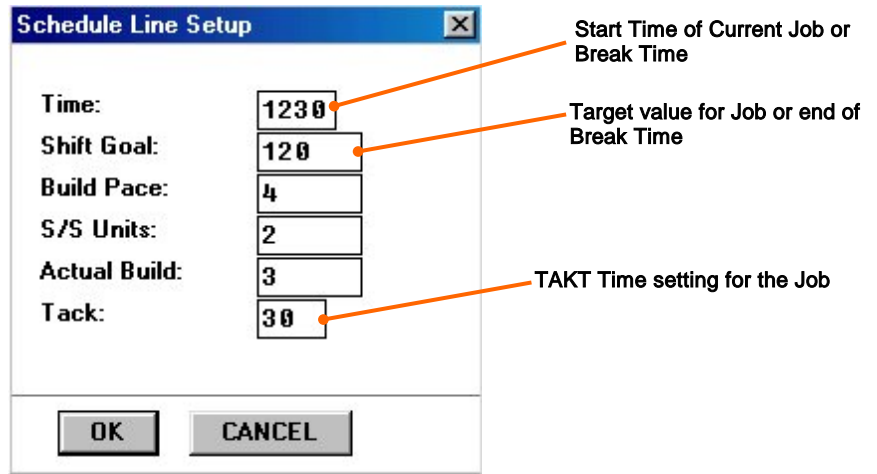


Figure 4.7 – Details for a Single Job.

- Click the *OK* button to finish.

In the example shown in Fig 4.6, The first shift starts at 8.00am and finishes at 4pm. The Goal is 120 units for the current job and the Tack is set to 30 seconds.

The TAKT Time value is set to provide a moving target to which the current production level may be monitored. This value is set at the operators discretion and is used in incrementing the Build Pace value and the calculation of the percentage efficiency.

4.5. *Set the Time and Date*

To set the current Time and Date, do the following steps:

1. Click on *Start > Programs > ProdnSDS*
2. Click on *Configuration > Set Time*
3. On the dialog box, click on the *Yes* button.

NOTE: Make sure your PC is set to the correct Date and Time as this is the Date and Time that will be stored in the Displays memory.

4.6. Message Editor for Dataline

To send text to the 30 character Dataline section of the Display, click on the *DATALINE 1, 2 or 3* button to open the Message Editor Interface. Enter your text message in the text box and click on the 'SELECT' button. The message is now added to the message list at the bottom.

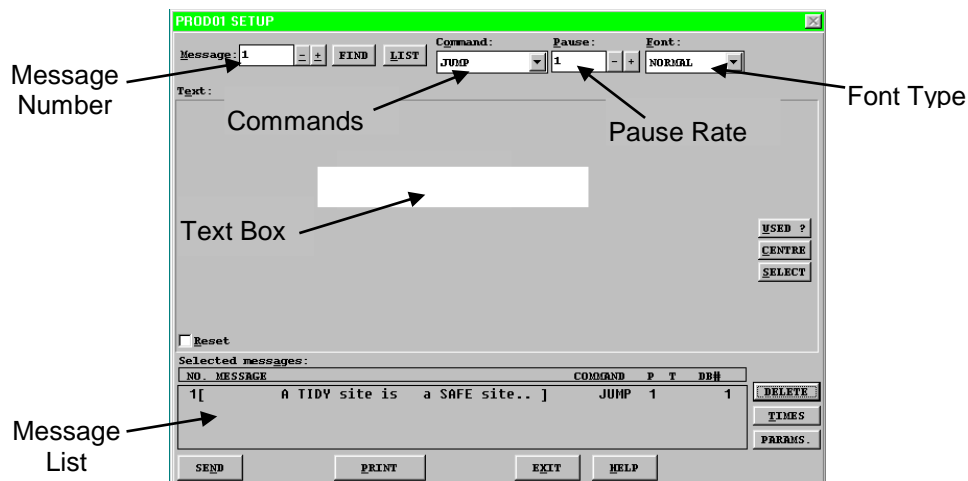


Figure 4.8 – Message Editor

Click on the 'SEND' button twice to send the new text message to the Display

To edit a text message, click the message number (+/-) to show the message in the text box. Make the changes to the text message and click on the 'SEND' button. The changes to the message are shown in the message list. Click on the 'SEND' button again to send the new changes to the Display.

NOTE: Messages 10, 11 and 12 are reserved for motivational messages that relate to production performance. They are displayed for a two minute period in every ten.

Various Commands, Pause Rates and Font Types can be selected from the drop down lists to give your message more effect.

When messages are sent to the Display, click on the 'SIMULATION' button to view the text message currently being shown on the Display.

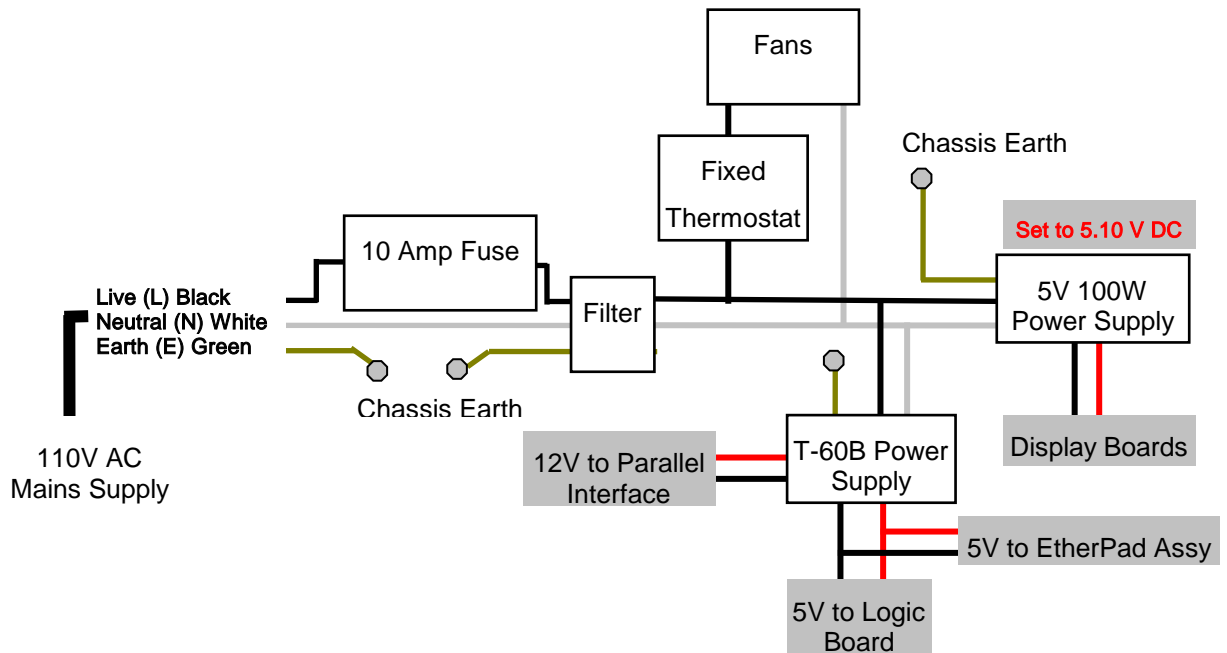
4.7. Exporting Data

As the days production data is being processed, it is stored in the text file, report.txt. This file is located in the folder *C:\ProdnSDS*. Use Notepad.exe or similar application to open and view the data in this file. As the data in ASCII format, it can be imported into a spreadsheet package such as MS Excel or similar for analysis.

5. System Wiring

5.1. Power Supply

The Display operates from an incoming mains supply of 110 Volts AC. The Live (Black) and Neutral (White) wires are terminated at the PSU via a 10 Amp Fuse and Filter. The Earth (Green) is terminated using an M5 ring crimp and is securely fixed to the main Earth point on the chassis of the Display.



5.1 - Mains Power Supply Distribution.

5.2. Power Supply Units

Power Supply Units provide the DC power for the various electronic components in the Display Board. There are two off 5V 100W and a single T-60B PSU installed in the Display. The 5V 100W PSU provide DC power to the Display Boards while the T-60B provides 12V power for the Parallel Interface and 5V power for the Logic Boards and EtherPad Assy. **NOTE:** When replacing a 5V PSU, set the output voltage to 5.10V.

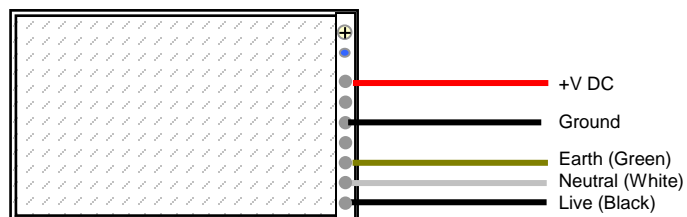


Figure 5.2 – Typical Wiring of a Power Supply Unit.

5.3. Logic Boards 2000 and 2001

The Logic Board is the principal circuit board in the Display. The Board contains the CPU, memory and interface circuitry for the Display system. There are two Logic Boards used in this application, Logic 2001 which controls the Databoard section and Logic 2000 that controls the 30 character Dataline section.

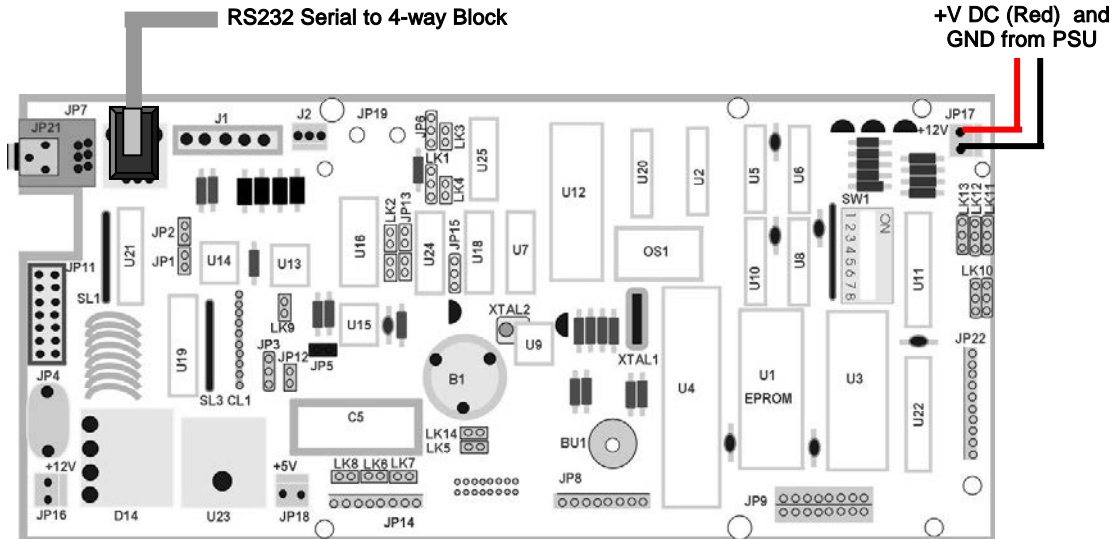


Figure 5.3 – Typical Wiring for Logic 2000.

Connected to the 2001 Board is the 5V DC Power, the 10-way Molex from the Parallel Interface, the four way Molex for the stack light and the RS232 serial connections.

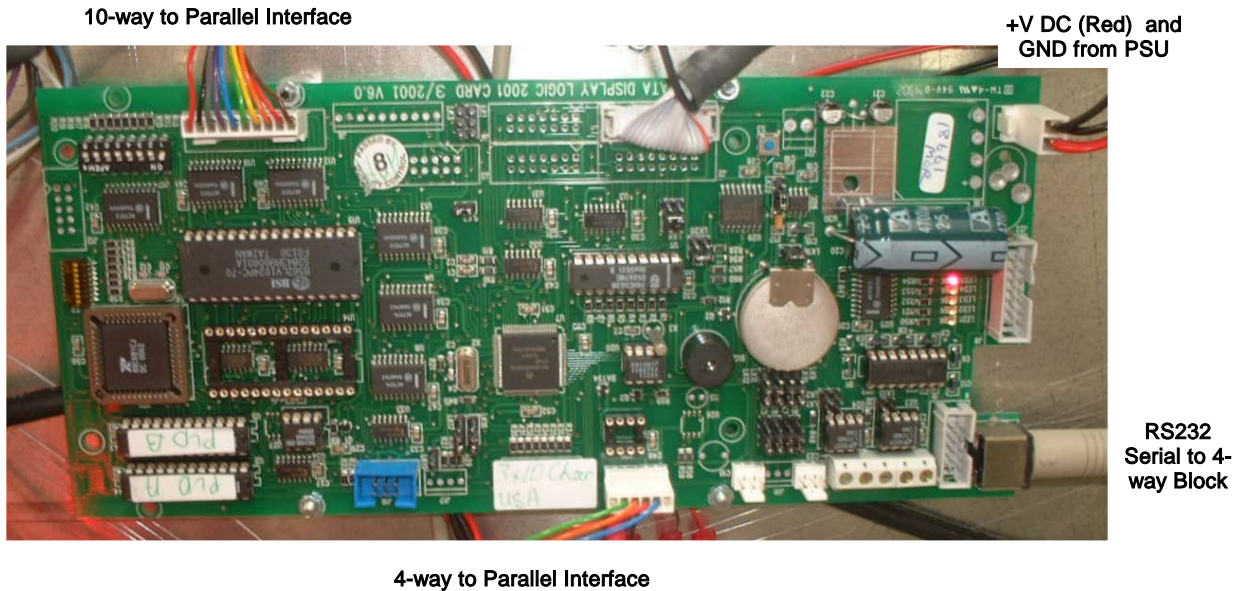


Figure 5.4 – Typical Wiring for Logic 2001.

5.4. Parallel Interface

The Parallel Interface Board is used to detect level changes and cause appropriate responses from the Display. For this application, the inputs at JL1 and JL2 are used to increment the Actual value.

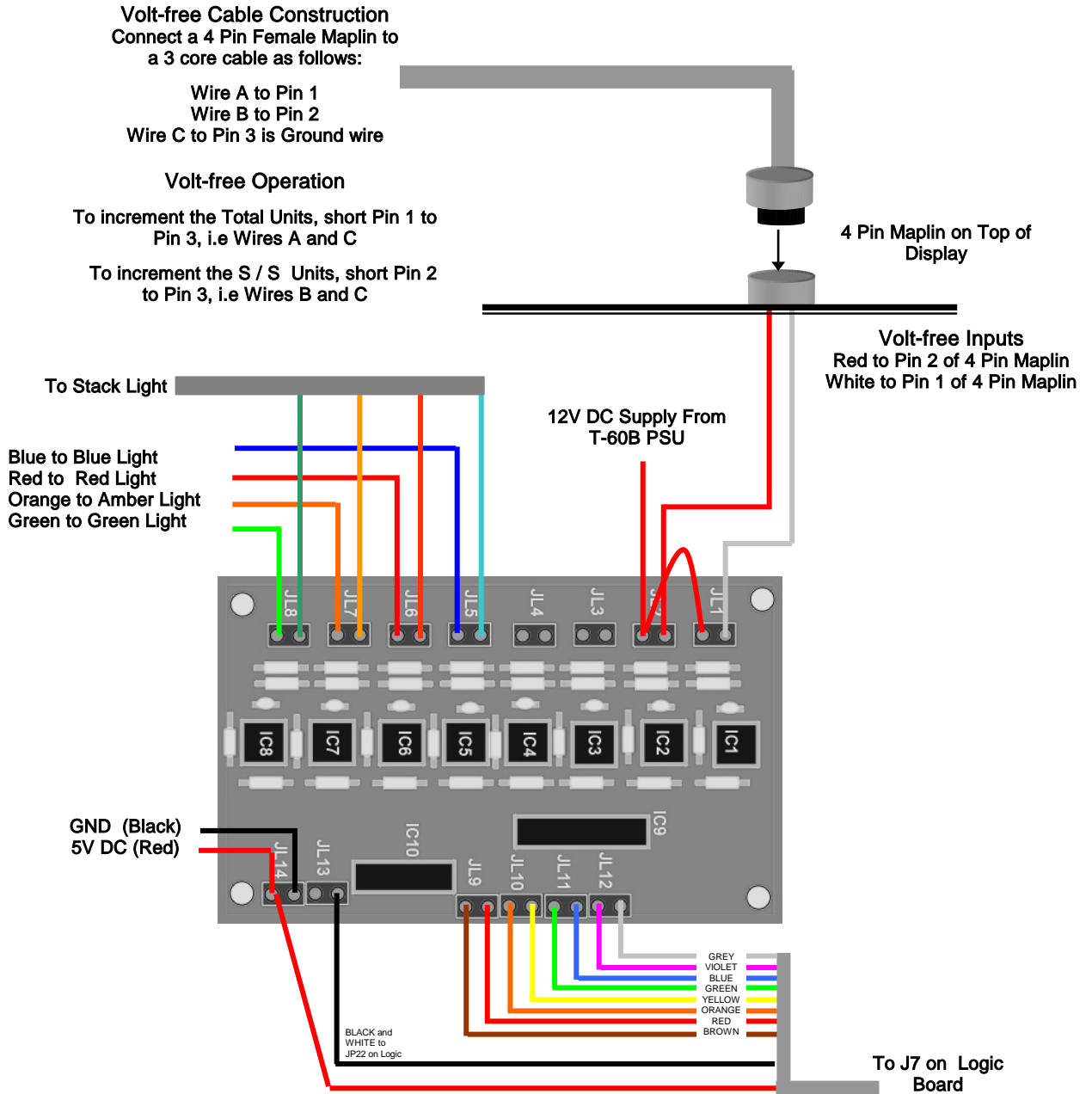


Figure 5.5 - Parallel Interface Wiring.

6. Maintenance

Warning: *Disconnect the power supply before you remove any display panels. Make sure work area is clean and clear of tools and miscellaneous items of equipment after maintenance.*

6.1. Maintenance Instructions

6.1.1. Preventative Maintenance

Inspect the Display for defects before each operation. Do a visual check for the following:

- Damaged or dirty Lens
- Loose Cables
- Defective LEDs

6.1.2. Cleaning the Display

Routine cleaning of the Display Board is at the discretion of the operator and subject to local conditions. Use damp non-abrasive materials such as a sponge, or lint-free cloth and a soft detergent (washing-up liquid) to clean the Display. Remove difficult stains or marks with a suitable solvent. **DO NOT USE** sharp or metal objects.

6.1.3. Corrective Maintenance

To do maintenance tasks, unscrew the screws at the side of the Display and remove the Side Profile. Remove the Lens carefully and put in a safe place.

Replacing a defective Display Panel:

1. Unscrew the attaching screws and disconnect all relevant wiring
2. Replace the Display Panel and connect all wiring.

Replacing a defective Logic Board:

1. Unscrew the attaching nuts and disconnect all relevant wiring
2. Replace the Logic Board and connect all wiring.

Carefully slide the Lens back on the Display and attach the Side Profile. Clean the Display with a damp cloth and make sure the unit is watertight after all maintenance.

Replacing a defective Fuse:

1. Use a flat-head screwdriver to open the Fuse holder on the Display
2. Replace the Fuse
3. Close the Fuse Holder.

NOTE: When replacing a 5V PSU, set the output voltage to 5.10V.

6.1.4. Special Measures following a Stoppage

If the Display is out of service for a long period of time, carefully remove the Display and store it in a cool dry place.

6.2. Handling Equipment

- One working platform
- Standard tool kit

6.3. Special Tools

There are no special tools required.

6.4. Spare Parts

For spare parts, contact your nearest Data Display Customer Service Department.

Make sure to quote the Data Display No. in the Product Specifications section of this Manual and the Serial No. of the Display.

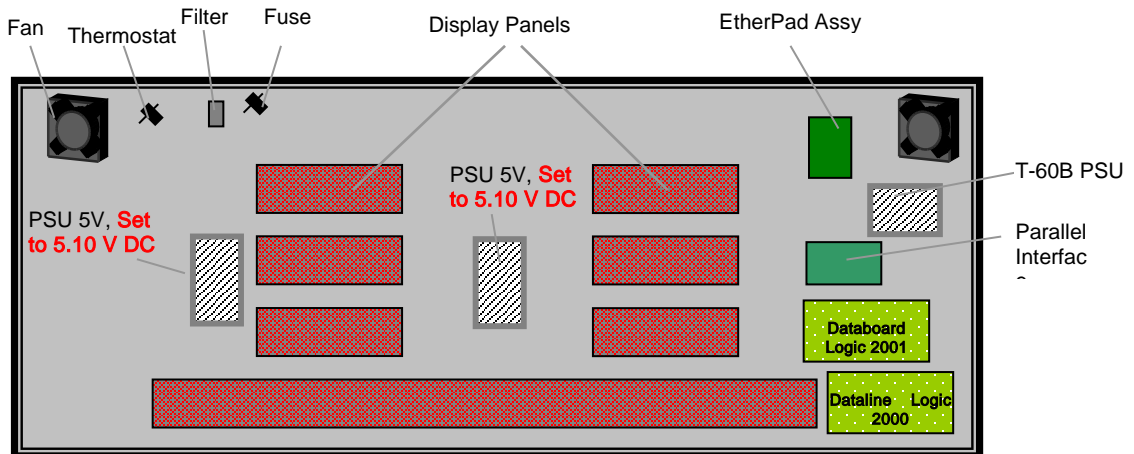


Figure 6.1 – Location of Parts.

Part Number	Description
DL305SBR	Display Panel, 12 off
AUTOLOGIC2000	Logic Board, 2000
AUTOLOGIC2001	Logic Board, 2001
AUTOPCBP/I	Parallel Interface
AUTOSANSPEOPLE	EtherPad Assy
D00-2217	PSU, 5 Volt, 100W, 2 off
D00-2232	PSU, T60B, 1 off
D00-453202	Fan, 2 off
D00-1670	Filter
D00-3324	Fuse, 10 Amp

Table 6.1 - Replaceable Parts for Display Board.

7. Product Specifications

CHARACTERISTIC	VALUE
<i>Display Features</i>	
Display Type	Production Display Board
Model	DB03 10 08 / Dli 330
No. of Lines per Board	3 Databoard, 1 Dataline
No. of Characters per Line	10 (Databoard) , 30 (Dataline)
Character Height	3 inch
LED Colour	Super-bright Red
<i>Communication</i>	
EPROM	American_30, 9600 D4.0
Protocol	DB Win
Baud Rate	9600
Data Format	8 bit, 1 stop bit, no parity
Addressing	Pre-configured and should not be changed.
<i>Electrical</i>	
Power	110V AC
Fuse Value	10 Amp
<i>Housing</i>	
Dimensions (LxHxD)	100in x 30in x 3.5in
Housing	Welded Aluminium, Black
Front Screen	5mm Red, Polycarbonate
<i>Environmental Conditions</i>	
Temperature Range	-5°C to 65°C
Humidity Range	5% to 80% without condensation

Table 7.1 - Product Specifications.