Production Board
User Manual

Title Page

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Figure 1.1 – Production Display.

Table of Contents

1. Introduction

1.1. Scope

The scope of this document covers the operation and maintenance of the production board display.

1.2. Purpose

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

1.3. System

The system consists of a production board with a 3 line, 10 character databoard section with three green and three red lamps. The red lamps switch on when the timer on a production line is started. When it is stopped, the green lamps are switched on.

There are two fields for each line that show the board count and the down time of each line.

The board count and time values are entered using a QWERTY keyboard supplied with the display. During operation, these values may be changed and the time started and stopped for each line.

The down time values are displayed in hours:minutes format.

All LED characters in the board and time fields are 50mm high and use surface-mount amber (Boards) and red (Timer) LED technology.

2. Installation and Operation

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 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.

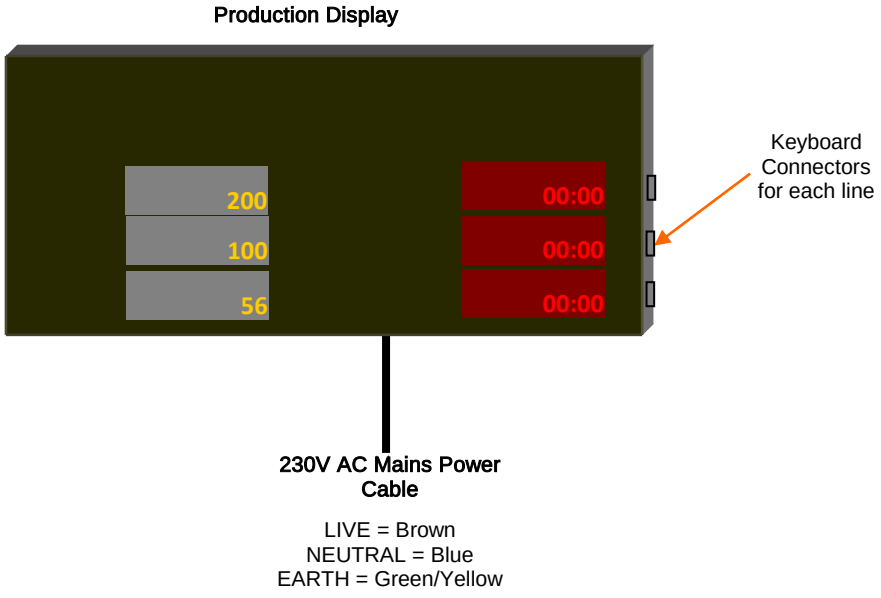


Figure 2.1 – System Configuration.

2.3. Operation

The keyboard supplied with the display is used to enter and edit the values on each line. Each line has a keyboard connection at the right-hand side of the display. Connect the keyboard to the relevant line that you wish to edit.

The following keyboard keys are used for the various functions.

Board Count

To set the board count value:

1. Press the Q key
2. Enter the numeric value
3. Press the STOP/RUN key.

To add to the board count value:

1. Press the A key
2. Enter the numeric value.

To reset to the board count value to 0:

1. Press the Z key.

Timer

To start the timer from 00:00:

1. Press the SPACE key.

To stop the timer:

1. Press the PAUSE key.

To continue:

2. Press the ⟶ key.

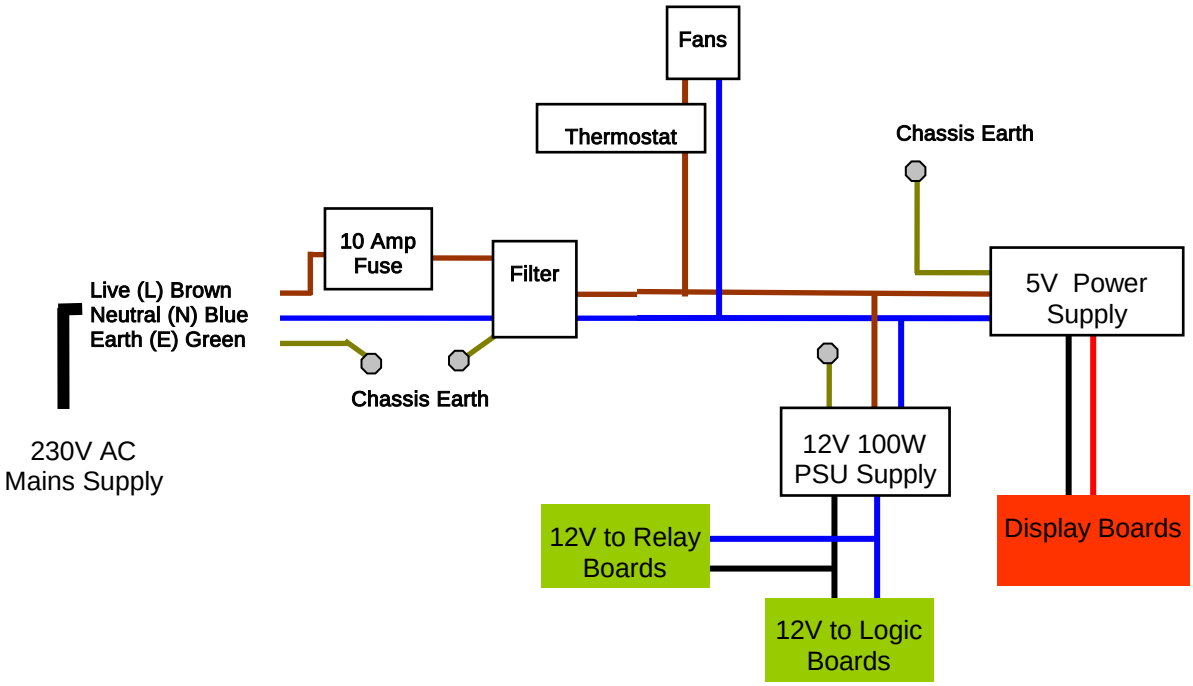
To reset the timer back to 00:00:

3. Press the CE key.

3. System Wiring

3.1. Power Supply

The display operates from an incoming mains supply of 230 Volts AC. The Live (Brown) and Neutral (Blue) wires are terminated at the PSU via a 10 Amp fuse and filter. The Earth (Yellow/Green) is terminated using an M5 ring crimp and is securely fixed to the main Earth point on the chassis of the display.



3.1 - Mains Power Supply Distribution.

3.2. Power Supply Units

Power supply units (PSU) provide the DC power for the various electronic components in the Display Board. The 5V PSU provides DC power to the display boards. The 12V PSU provides DC power logic boards and relays.

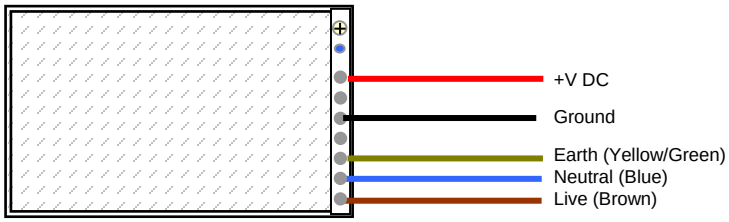


Figure 3.2 – Typical Wiring of a Power Supply Unit.

3.3. Logic Board 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 three logic boards used in this application. Their locations and functions are shown in the Figure below.

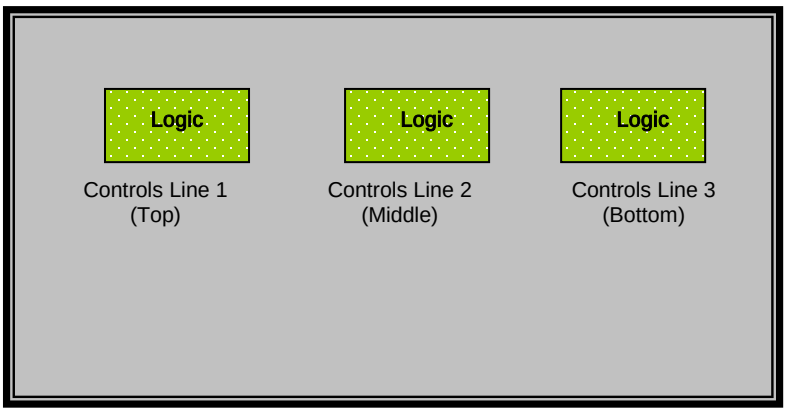


Figure 3.3 – Location of Logic Boards.

Connected to the each board is the 12V DC Power, the 14-way display cable and the RS232 serial connection.

4. Installation

WARNINGS

1. Displays are powered from a mains supply of 230V AC.
2. All installation personnel must be familiar with good manual lifting practice.

4.1. Precautions

Regulations

All personnel involved in carrying out the work must be aware of any site working regulations for the contract and must have certification for any formal training required.

Safety measures

WARNINGS

Before carrying out any installation work involving 230V AC mains, make sure that all connection points are dead, i.e. isolated from the source of the Mains Power supply. Verify the points to be worked on are dead by using appropriate test equipment.

Appropriate safety measures shall be enforced while work is carried out and in particular special precautions taken when working off ladders and/or scaffold platforms.

If required, lifting equipment must be used to position the Display just prior to fixing into position at the site or if the Displays are to be moved over long distances.

4.2. Fixing Points

Type 1 brackets are supplied to mount the display.

During installation, make sure that there is adequate space for the routing and bending of cables at the rear. Care should also be taken so as not to damage the electronic assemblies inside the display.

4.3. Power Requirements

Display Power: 230V AC

4.4. Mains Cable Connections

An external 230V AC supply is required to power the display. The customer supplies the mains socket.

A suitable tester should be used to verify that the mains cabling is connected correctly between local 220/240V AC mains power outlet and the display.

5. Fault Finding and Diagnostics

5.1. Description

Faults may be broken down into 3 categories, Hardware, Communication and Power. Possible faults include:

- Flickering LED or blank display boards, (Hardware, Comms or Power)
- Spurious Information, (Comms)
- Power Supply Failure, (Power)
- Defective PCBs, (Hardware, Comms or Power)
- Defective Cables, (Hardware)

The following test and repair equipment is recommended: Basic Toolkit, Digital Multimeter and Soldering Iron.

NOTE: For any reported fault, check that all data cables are routed correctly and all connectors are attached securely on display boards and PCBs.

Reported Fault	Action
LED Fault	Check if all or part of the display board is faulty. If only part of the display board is faulty, the display board can be replaced. Before replacing the board, check that DC power to the display board is +V and that data cables are not faulty. If power and data cables are not faulty, power down the display and replace the defective board. Power up the display and check that the fault has been rectified. If the entire display board is blank, check the power supply.
Power Supply Failure	Firstly, check that the external power supply has not been disconnected or switched OFF. Power down the display and check that the fuse at the bottom of the display has not blown. If not check the PSUs. PSUs convert the AC power (Inputs) to DC power (Outputs) within the displays. Check for mains power (230V AC) at the Live and Neutral inputs on the PSUs. If the mains input is correct, check the PSU DC outputs. If there is no +V DC output, power down the display and replace the defective PSU. Power up the display and check that the fault has been rectified. If not, check for mains power (230V AC) at the Live and Neutral inputs and outputs on the filter. If defective, replace the filter.
Total Display Failure	1. Check that the there is no power supply fault as above. 2. If all PSU inputs and outputs are correct, check that all serial cables are connected correctly. 3. If the display is receiving messages and responding but incorrect messages or garbled information is appearing on the display, change the logic board to rectify the fault. 4. If the problem has still not been rectified, please contact the Technical Support Dept. Details in next section.

Table 5.1 – Fault Finding.

5.2. Technical Support

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

Data Display Ireland

Tel #: (065) 7072600

Fax #: (631) 7071311

E-mail: sales@data-display.com

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

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. 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

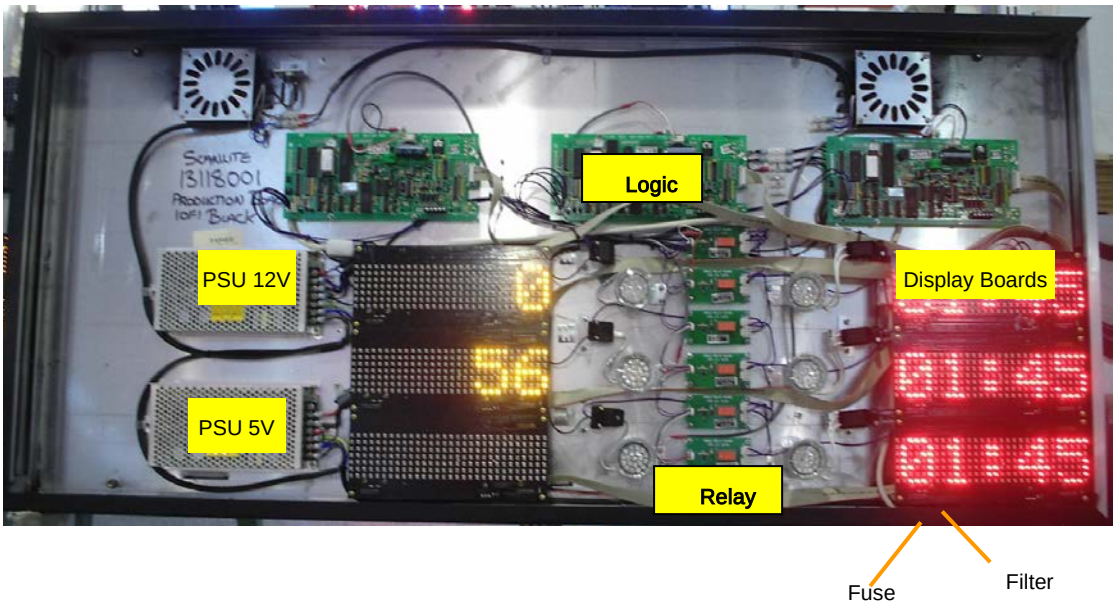
6.3. Special Tools

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.



Part Number	Description
DL205-NSMC-Amber	LED Display Board, Amber
DL205-NSMC-Red	LED Display Board, Red
AUTOLOGIC2001	Logic Board, 2001
D00-2217	PSU, 5 Volt
D00-2216	PSU, 12 Volt
D00-1670	Filter
D00-3324	Fuse, 10 Amp
AUTORELAY PCB	Relay Board

Table 6.1 - Replaceable Parts for Display Board.

6.5. Removal and Replaceable Instructions

When removing and replacing any items, do the following steps:

1. **Disconnect the mains power supply to the display.**
2. **Unscrew the screws at the side of the display and remove the side profile.**
3. **Remove the lens carefully and put in a safe place.**
4. **All hardware removed from the display should be stored in a safe place.**

6.5.1. Removing a PSU

a) Refer to 6.5. and do steps 1 to 4.

b) Make sure that there is no Mains Power at the LIVE terminal on the Filter using a DMM.

c) Locate the defective PSU and remove the clear plastic cover from the terminals, if necessary.

d) Disconnect the crimp terminals and make note of wires and their locations.

e) Unscrew the screws holding the PSU to the Display chassis and remove the PSU. Retain all screws, washers, spacers, nuts etc for further use.

6.5.2. Installing a PSU

a) Spread a layer of Heat Sink Compound over the rear of the PSU.

b) Attach the PSU to the Display chassis using the washers and nuts removed previously.

c) Connect the crimp terminals.

d) Replace the clear cover over the terminals, if necessary.

e) Connect the mains power to the Display at the external isolator.

f) Check the DC output of the PSU.

g) Slide in the Lens and attach the Side Profile.

h) Test the Display.

i) Clean the Display and fill in the maintenance report.

6.5.3. Removing a Logic Board

a) Refer to 6.5. and do steps 1 to 4.

b) Make sure that there is no mains power at the LIVE terminal on the Filter using a DMM.

c) Locate the Logic Board and disconnect all plugs/sockets and screw terminals. Carefully note their locations for reconnection.

d) Unscrew the nuts, washers etc that secure the Logic Board to the Display chassis.

e) Remove the Board.

NOTE: Take care not to move the Dip Switch settings accidentally.

6.5.4. Installing a Logic Board

a) Attach the new Logic Board to the Display chassis with the nuts and washers retained during removal

b) Check that all switches and links on the new Board are set to the same as the defective Board.

c) Connect the Mains Power to the Display at the external isolator.

d) Slide in the Lens and attach the Side Profile.

e) Test the Display.

f) Clean the Display and fill in the maintenance report, if necessary.

6.5.5. Removing a Display Board

a) Refer to 6.5. and do steps 1 to 4.

b) Make sure that there is no mains power at the LIVE terminal on the Filter using a DMM.

c) Locate the faulty Display Board.

d) Remove the screws that attach the Display Board. **NOTE:** Place the screws in a safe place for installation of new Board.

e) Disconnect the Data and Power connectors from the Board. Note the locations of each connector and how it is connected for the installation of the new Board.

f) Remove the Display Board.

6.5.6. Installing a Display Board

a) Replace the Data and Power connectors in their correct locations. NOTE: Power and Data cables are keyed. Installing them incorrectly will damage the connectors.

b) Attach the Display Board with the screws retained during removal.

c) Restore power at the external isolator.

d) Slide in the Lens and attach the Side Profile.

e) Test the Display.

f) Clean the Display and fill in the maintenance report, if necessary.

6.5.7. Removing a Mains Filter

a) Refer to 8.5. and do steps 1 to 4

b) Make sure that there is no mains power at the LIVE terminal on the Filter using a DMM.

c) Disconnect the crimp terminals and note the locations. Leave the earth terminal until last.

d) Unscrew the securing nuts holding the Mains Filter to the chassis and remove the Filter. Retain all nuts and washers for further use.

6.5.8. Installing a Mains Filter

a) Attach the new Mains Filter to the chassis using the nuts and washers removed previously.

b) Reconnect the earth connection and crimp terminals.

c) Slide in the Lens and attach the Side Profile.

d) Test the Display.

e) Clean the Display and fill in the maintenance report, if necessary.

7. Product Specifications

CHARACTERISTIC	VALUE
Display Features	
Display Type	Production Display Board
Data Display No.	J13118001
No. of Lines per Board	3
No. of Characters per Line	10
Character Height	50mm
LED Colour	Red and Amber
Communication	
Hardware	QWERT style Keyboard
Electrical	
Power	230V AC
Fuse Value	10 Amp
Power Consumption	160W
Housing	
Dimensions (LxHxD)	1300mm x 600mm x 75mm
Housing	Welded Aluminium, Black
Front Screen	3mm Black, Polycarbonate
Environmental Conditions	
Temperature Range	-5°C to 65°C
Humidity Range	5% to 80% without condensation

Table 7.1 - Product Specifications.