ULTITEC Electronics c.c.

DISPLAY MODULE
ULTDM410
USER MANUAL

Specifications contained herein are subject to alterations without notice.

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1. INTRODUCTION

The ULTDM410 is a simple human interface to the standard range of ULTITEC Electronics barrier controllers, Loop detectors, Turnstile controllers and other various support controllers based car parking and access control industry.

This Display module uses Backlit 16 character by two line LCD. This unit will work in sunlit and dark applications.

The hand held module is small enough to be carried in ones pocket and robust enough for the average technician or engineer to handle. A standard stereo 3,5mm jackplug cable is used to connect the display module to the unit to be tested or programmed.

Another advantage is, the unit does not require batteries as it derives its power from the unit it is connected to.

2. TECHNICAL DATA

2.1 Functional data

Serial communications	Propriety ULTITEC Electronics simplex 38K Baud Single wire 5V protocol.

2.2 Electrical Data

Power requirements	5VDC to 12VDC 80mA max

2.3 Environmental Data

Operating temperature	0°C to 70°C
Humidity	Up to 90% relative humidity without condensation.
Circuit protection	Conformal coating over PCB

2.4 Mechanical Data

Mounting Position	Hand held
Connections	3,5mm stereo jackplug
Dimensions	95,5mm(L) by 60,5mm(W) by 19,5mm(H)
Weight	74g approx.

3. OPERATING INSTRUCTIONS

3.1 Hardware setup

The ULTDM410 Display Module is designed to be handheld to facilitate the diagnostics and programming of the test unit it plugs into.

To operate the unit it must be plugged into the test unit via a 3,5mm jackplug cable.

3.2 Contrast setup

Press the mode button within one second of powering up the display module. The display will display " Contrast " and a series of bars underneath. By pressing the right or left buttons, the numbers of bars will go up or down respectively. The writing will become more or less faint.

3.3 Back-light setup

Press the mode button. The display will display " Backlight " and a series of bars underneath. By pressing the right or left buttons, the numbers of bars will go up or down respectively. The back light will either become more intense or less intense.

3.4 Mode button

The mode button is usually used in conjunction with the left or/and right button to launch the Program mode on the test unit. It may also have other functions such as raise or lower a barrier or retune a detector.

3.5 Left and Right buttons

The left/down button is used to decrement a number or move a cursor left on the screen. In diagnostic modes it is used to move down to the next diagnostic function.

The right/up button is used to increment a number or move a cursor right on the screen. In diagnostic modes it is used to move up to the next diagnostic function.

4. PRINCIPLE OF OPERATION

The ULTDM410 is a simple unit and has no real intelligence other than decode a serial communication signal. All the information on the display comes from the Test unit. All the settings are also stored on the Test unit not the display.

This unit will work on the 300 and 400 series Test units.

5. CONFIGURATION

5.1 Pinouts

PIN NUMBER	FUNCTION
1	Positive 5VDC to 12VDC
2	Signal
3	Negative

6. FAULT AND DIAGNOSTICS ANALYSIS

6.1 Initial diagnostics

6.1.1 Nothing is displayed on connecting up the Test unit;

1) Check the cable is connected properly.
2) Make sure the Test unit is powered up.
3) Make sure the Test unit is of the 300 series or 400 series.

If nothing is still displayed, try a new cable.

If a new cable does not solve the problem, connect the Display module to another Test unit.

If nothing is still displayed, then return the Display module to be repaired.

6.1.2 If the unit flickers or displays on one line or displays unusual characters. Unplug the display module and wait five seconds before reconnecting.

7. COMMUNICATION PROTOCOL

Hardware

Twenty character by 2 line LCD black on white backlit display.

RS232 setup

Baud = 19200
Parity = none
Stop bits = 1

Software commands

This unit requires commands that are 16bits long.

After the unit receives a valid 2 byte string the unit will reply with a 1 byte button status.

Stop	0	0	0	0	0	0	LB	RB	CB	Start

CB = 1 : Centre button inactive
CB = 0 : Centre button active
RB = 1 : Right button inactive
RB = 0 : Right button active
LB = 1 : Left button inactive
LB = 0 : Left button active

7.0 Instruction set

Instruction	DBF	DBE	DBD	DBC	DBB	DBA	DB9	DB8	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Function
Display Clear	0	X	X	X	X	0	0	0	1	0	0	0	0	0	0	1	Clear entire display area, restore display from shift, and load address counter with DDRAM address 00h.
Display/ Cursor Home	0	X	X	X	X	0	0	0	1	0	0	0	0	0	1	X	Restore display from shift and load address counter with DDRAM address 00h.
Entry Mode Set	0	X	X	X	X	0	0	0	1	0	0	0	0	1	I/D	S	Specify direction of cursor movement and display shift mode. This operation takes place after each data transfer (read/write).
Display ON/OFF	0	X	X	X	X	0	0	0	1	0	0	0	1	D	C	B	Specify activation of display (D) cursor ©) and blinking of character at cursor position (B).
Display/ Cursor Shift	0	X	X	X	X	0	0	0	1	0	0	1	S/C	R/L	X	X	Shift displays or move cursor.
Function Set	0	X	X	X	X	0	0	0	1	0	1	DL	1	0	X	X	Set interface data length (DL ;8 bit/4bit)
RAM Address Set	0	X	X	X	X	0	0	0	1	1	ACG						Load the address counter with a CGRAM address. Subsequent data access is for CGRAM data.
DDRAM Address Set	0	X	X	X	X	0	0	1	1	ADD							Load the address counter with aDDRAM address. Subsequent data access is for DDRAM data.
Busy Flag/ Address Counter Read	0	X	X	X	X	0	1	BF	1	AC							Read Busy flag(BF) and contents of Address counter (AC)
CGRAM/ DDRAM Data Write	0	X	X	X	X	1	0	D7	1	Write data							Write data to CGRAM or DDRAM
CGRAM/ DDRAM Data Read	0	X	X	X	X	1	1	D7	1	Read data							Read data from CGRAM or DDRAM

DDRAM : Display Data RAM
CGRAM : Character Generator RAM
ACG : Character Generator RAM Address
ADD : Display Data RAM Address
AC : Address Counter

X = Disregard
I/D = 1 : Increment
I/D = 0 : Decrement
S = 1 : Display Shift On
D = 1 : Display On
C = 1 : Cursor Display on
B = 1 : Cursor Blink On
S/C = 1 : Shift Display
S/C = 0 : Move Cursor
R/L = 1 : Shift Right
R/L = 0 : Shift Left
DL = 1 : 8-bit
DL = 0 : 4-bit
BF = 1 : Internal operation
BF = 0 : Ready for instruction

DDRAM valid 1st line address from 0x00 to 0x13
and 2nd line address from 0x20 to 0x33

7.1 Character Generator ROM (CGROM)

The character generator ROM generates 5x8 dot character patterns from 8-bit character codes. It can generate 160 5x8 dot character patterns. Character codes from 10h to 20h and from 80h to 9Fh are assigned for null character patterns.

7.2 Character Generator RAM (CGRAM)

In the character generator RAM, the user can rewrite character patterns by program. 8 character patterns can be written during run time. The table below shows the relatiob between the CGRAM address and the CGRAM data or patterns. The character codes from 00h to 0Fh in the ROM table are used to get character patterns from the CGRAM.

CGRAM Address						**CGRAM Data**								**Pattern number**
A5	**A4**	**A3**	**A2**	**A1**	**A0**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	
0	0	0	0	0	0	X	X	X	0	1	1	1	0	Pattern 1 (A)
						X	X	X	1	0	0	0	1	
						X	X	X	1	0	0	0	1	
						X	X	X	1	1	1	1	1	
						X	X	X	1	0	0	0	1	
						X	X	X	1	0	0	0	1	
						X	X	X	1	0	0	0	1	
						X	X	X	1	0	0	0	1	
						X	X	X	1	0	0	0	0	Pattern 2 (L)
						X	X	X	1	0	0	0	0	
						X	X	X	1	0	0	0	0	
						X	X	X	1	0	0	0	0	
						X	X	X	1	0	0	0	0	
						X	X	X	1	0	0	0	0	
						X	X	X	1	1	1	1	1	