X-Board Series

Including the I-Series, S-Series, and U-Series

Configuration Manual

Revision 1.0

PCB Revision: 1.0 or Higher

Firmware Revision: 7.0 or Higher

Revision History

Revision	Description	Author
1.0	Initial Release	Clark

Contents

Features

The Matrix Orbital *X*-Board combines one of three simple communication protocols with a robust yet easy to use command structure to provide a cost and time effective interface solution to a wide variety of parallel alphanumeric displays. The 1x16 and 2x8 interface headers offered provide a versatile connection to alphanumeric displays ranging in size from 1 row by 8 columns to 4 rows by 20 columns.

Once configured using the simple steps outlined below, the *X*-Board will provide control of not only text, but display functions such as backlight and brightness settings, and even offers three general purpose outputs. Full details regarding this extensive command set can be found in the Economy Series manual.
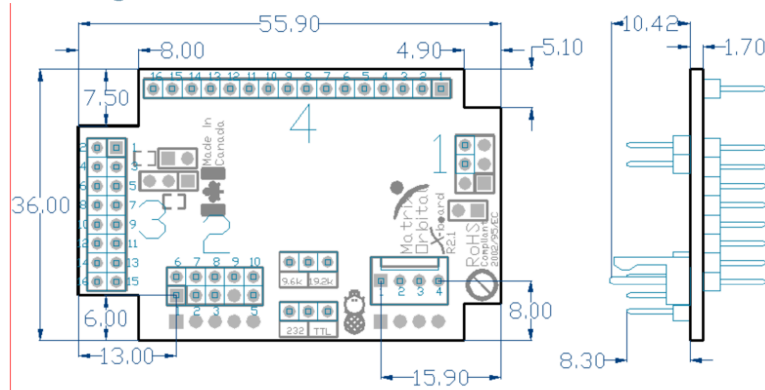
Hardware

Drawing

Figure 1: X-Board (S-Series)

Table 1: X-Board Configuration Interfaces

#	Description
1	Configuration Initialization
2	Configuration Pins
3	2x8 Display Interface
4	1x16 Display Interface

Pinout

Table 2: X-Board Display Pinout

Pin	Symbol	Description	Pin	Symbol	Description
1	Vss	Power Supply Ground (0V)	9	DB2	Data Bit 2 (NC in 4 bit mode)
2	Vdd	Logic Voltage (5V)	10	DB3	Data Bit 3 (NC in 4 bit mode)
3	Vo	Contrast Voltage ()	11	DB4	Data Bit 4 (LSB in 4 bit mode)
4	RS	Register Select	12	DB5	Data Bit 5
5	R/!W	Read/!Write	13	DB6	Data Bit 6
6	E	Enable	14	DB7	Data Bit 7 (MSB in 4 bit mode)
7	DB0	Data Bit 0 (NC in 4 bit mode)	15	A	Backlight Anode
8	DB1	Data Bit 1 (NC in 4 bit mode)	16	K	Backlight Cathode

Configuration

Once mated to a suitable display, the X-Board interface module must be configured to display information correctly on the attached screen. While a wide variety of displays are supported, please note that the *X*-Board is designed to interface to a single controller, HD44780 or similarly driven, alphanumeric display using 4bit mode. Consult your display manual for specifications pertaining to the driver used, as well as specifications for input power to both display and backlight. Note that backlight connections may not be required for VFD or PLED style displays.

Should an error be made in completing any of the steps below, the unit will display an "Invalid" message, prompting the repetition of that step. The configuration sequence can be started at any time, even if it has not yet been completed, by beginning from the initialization step. Once the *X*-Board is configured correctly, please see the Economy Series manual for further feature information.

Initialization

1. Ensuring that the power is off, place a jumper on the Configuration Initialization pins.
2. Power the *X*-Board on, waiting for the unit to light, then off. Remove the configuration jumper.
3. Power the module on again, after power up, "DISP RST" and "Set Type" should be displayed.

Display Type

1. Turn the power off.
2. Place jumper(s) on the Configuration Pins, to set the display type.

Display	Type	Pins
LCD	Any Color	1
VFD	Samsung	2
VFD	Noritake	3
PLED	Contact Matrix Orbital for Info	1 & 2

Table 3: Display Type Configuration

Display Size

Rows

1. Turn the power back on. If the correct pin(s) have been jumped, the display type should now be displayed on the screen along with the message "Set Rows".
2. Turn the power off and remove the jumper(s) from the Configuration Pins.
3. Place a jumper on the necessary Configuration Pins to configure the number of rows.

Rows	Pins
One	1
Two	2
Four	3

Table 4: Display Row Configuration

Columns

1. Turn the power back on. If the correct pin(s) have been jumped, "Rows:" and "Set Cols" should now be displayed on the screen.
2. Turn the power off and remove the jumper(s) from the Configuration Pins.
3. Place a jumper on the necessary Configuration Pins to configure the number of columns

Columns	Pins
Eight	None
Sixteen	1
Twenty	2
Twenty-Four	1 & 2
Thirty-Two	3
Forty	1 & 3

Table 5: Display Column Configuration

Exit Configuration

1. Turn the power off and remove the jumper(s) from the *Configuration Pins*.
2. Power on the display. "MO Xboard" should be displayed on the screen

Software Configuration

1.1. X-Board Software Configuration	Dec	254 209 77 79 117 110	Display Rows Columns
	Hex	FE D1 4D 4F 75 6E	Display Rows Columns
Configure all settings through the communication port, without need for jumpers.			
Display	1 byte, display type as shown in Table 3, pin 1 is LSB, pin 3 MSB, jumped pins designated by a '1'		
Rows	1 byte, number of display rows as shown in Table 4, pin 1 is LSB, pin 3 MSB		
Columns	1 byte, number of display columns as shown in Table 5, pin 1 is LSB, pin 3 MSB		

Ordering

Part Numbering Scheme

Table 6: Part Numbering Scheme

X-Board	U- Series
1	2

Options

Table 7: X-Board Options

#	Designator	Options
1	Product Type	X-Board Intelligent Interface Module
2	Communication Protocol	I-Series: I2C Communication Interface S-Series: Serial Communication Interface U-Series: USB Communication Interface

Contact

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