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7" GEMmodule™

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MK-070R

## Data Sheet

### Introduction:

The MK-070R is a fully integrated 7" WVGA production color display module to support a variety of embedded control interface applications. Featuring the Amulet GEM Graphical OS Chip™ for color displays, the module can be easily programmed using GEMstudio™, the easiest GUI design tool in the embedded space.

### Features:

- 800x480 WVGA TFT LCD
- White LED backlight
- Integrated resistive touch panel
- Amulet GEM Graphical OS Chip™
- 24 Pin Interconnector
- Royalty-free Graphical Operating System™
- On-Board memory - 64Mb Serial Flash for storing GUI pages
- Touch Panel Controller - Built into Graphical OS Chip™
- Color Supported - Palettized 8bit (1-bit alpha)
- Backlight can be controlled via the touch panel or external command
- Supports Unicode - Foreign language character sets
- Font Converter - Built-in

## General Specification

ITEM	STANDARD VALUE	UNIT
Pixels (Resolution)	800 X 480	dots
Outline dimension	164.9(H) x 100(V) x TBD(D)	mm
Active area	154.8(H) x 85.92(V)	mm
Pixel Size	0.1929 x 0.179	mm
Luminance	350 Typ.	Cd/m2
Operation Temp.	70 - 20	C

View Angle	12 O'Clock
Display Mode	TM, NW
Backlight	24 White LED
Backlight Control	PWM
Data Flash	64 Megabit
Interface	USB /RS232 /UART

## Electrical Characteristic

### Recommended Operating Conditions

5V	5V Recommended
5V Current	TBD Min

### DC Characteristics

V core Supply Current	22mA @1.2V
V input Low Level	-0.3 to 0.8V
V input High Level	2V to (Vcc + 0.3V )
Pull Up Resistors	70K to 175KOhms
IO Output Current	8mA
Static Current Excluding Power on Reset V core = 1.2V	600uA
Static Current Logic cells consumption, including Power on Reset and all input drivers V core = 1.2V	30uA

## Pin Descriptions

### Pin Type

I = Input

O = Output

P = Power Supply

Pin #	Signal	Type	Description
1	5V	P	5V @ 300mA
2	5V	P	5V @ 300mA
3	GND	P	Ground
4	GND	P	Ground
5	SCL	O	Serial Clock
6	SDA	O	Serial Data
7	COMMU RXD	I	CommU RXD UART
8	COMMU TXD	O	CommU TXD UART
9	PWM 1	O	Programmable Clock 1
10	PWM 2	O	Programmable Clock 2
11	Prog M	I	Program Mode - Float = Prog / GND = Run Note:1
12	PWM 0	O	Programmable Clock 0
13	RS232 TXD	O	TXD from RS232 Transceiver
14	T_CAL	I	Touch Panel Cal. - Float = Cal / GND = Normal Note:1
15	PROGU RXD	I	PROGU RXD UART
16	PROGU TXD	O	PROGU TXD UART
17	SPI C3	O	SPI Chip Select 3
18	RS232 RXD	I	RXD from RS232 Transceiver
19	SPI C2	O	SPI Chip Select 2
20			
21	MISO	O	SPI DATA In
22	SCLK	O	SPI Clock
23	RESET	O	System Reset by driving pin low
24	MOSI	O	SPI DATA Out

Note:1 Internally pulled up. Only pull to ground

**Errata: For MK-070R Revision XB2, Pin 11 (Prog M) is a no-connect.**

**Do NOT connect to this pin**

### Table 1. Header J3 24pin, 2mm, Hirose DF-11-24DP-2DSA

#### Mating Connectors

Hirose DF11-24DS-2R26 Straight

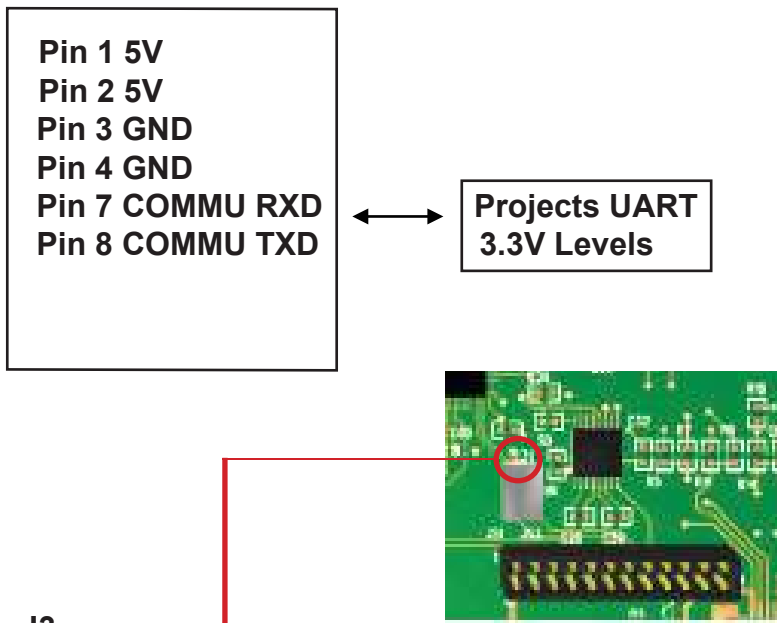
DF11-24DS-2C Right Angle

DF11-24DS-2DSA Board

JST PHDR-24VS

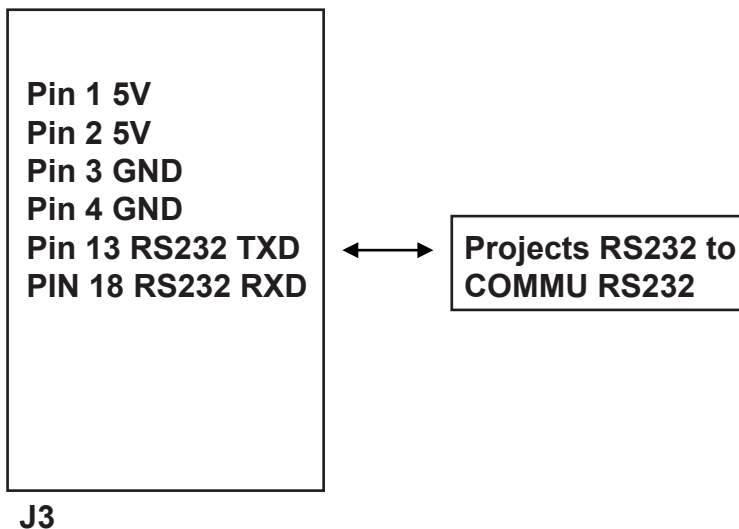
## J3 Wiring

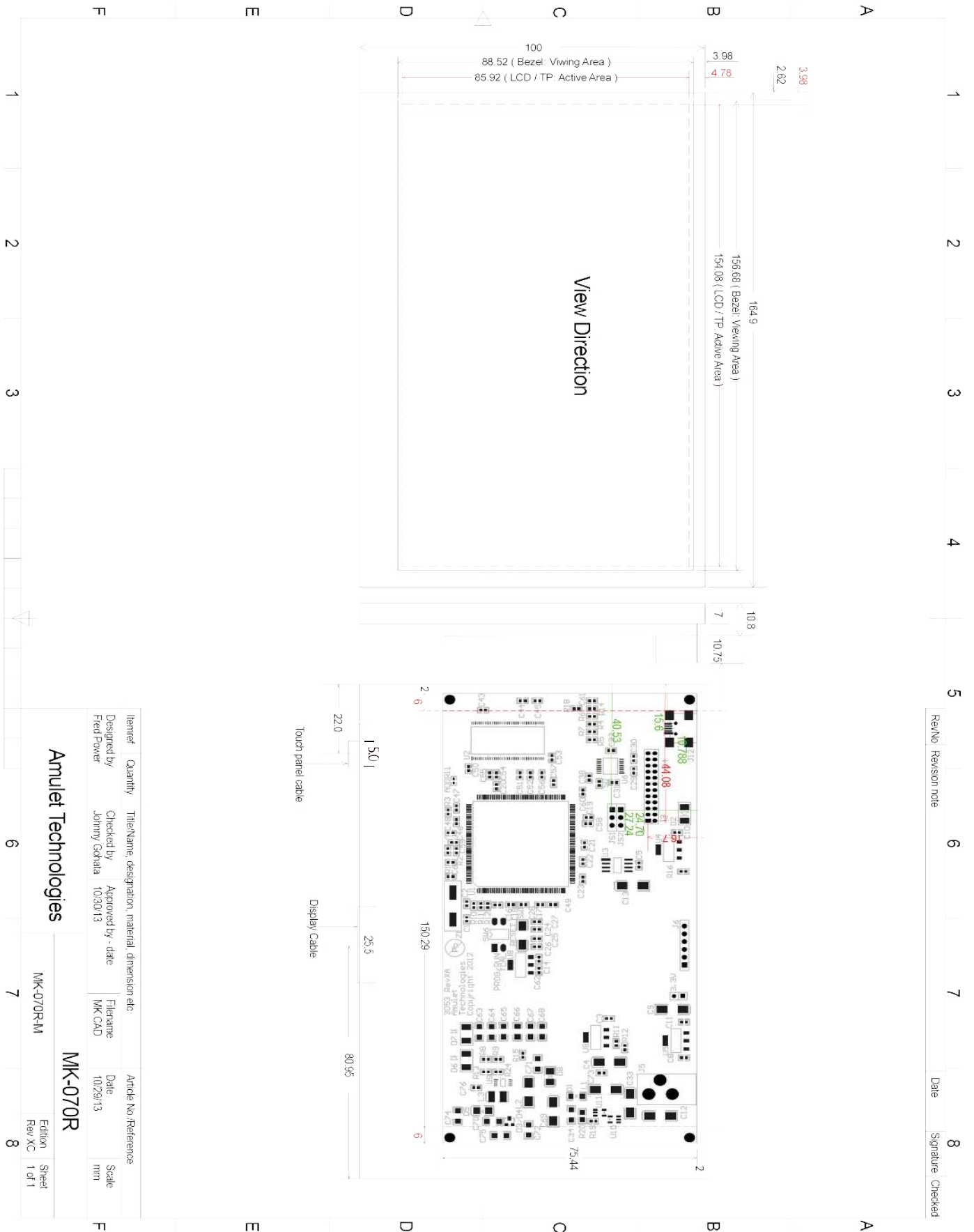
### Connecting Project via UART



Note: Cut Trace across **SD** and Jumper "D" side to C38 "8" side GND to take the RS232 Transceiver out of circuit.

### Connecting Project via RS232





RevNo	Revision note	Date	Signature	Checked

ItemNo	Quantity	TitleName, designation, material, dimension etc	Article No/Reference

Designed by	Checked by	Approved by - date	Filename	Date	Scale
Fred Power	Johnny Gohalia	10/30/13	MK CAD	10/29/13	mm

Amulet Technologies		MK-070R	
MK-070R-M		Edition	Sheet
		Rev. Xc	1 of 1

Notes: **MK-070R**  
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Communication and Program UARTs can be used for programming as well as for communication with the application's host processor.

If you wish to program via UART make sure you can get to the Reset and the Program Mode pins. These will only be needed if a serious programming issue occurs.

Pass-Through Programming information is available at our website under Field Update Utilities: <http://www.amulettechnologies.com/support/downloads/fieldupdates.html>.

Momentarily grounding reset with an open collector device or momentary switch will cause a reset. Reset must be applied after the Program Mode pin is changed for us to see it.

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