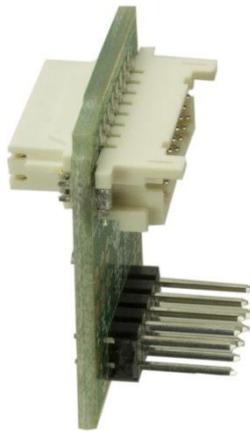# Crystalfontz

CFA-RS232 LEVEL TRANSLATOR BOARD

Datasheet Release Date 2017-06-05
for
CFA-RS232 Level Translator Board

Hardware Version: h1v1

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1. General Information

Datasheet Revision History
Datasheet Release: 2017-06-05 Datasheet v1.1 for the CFA-RS232 Level Translator Board

Product Change Notifications
To check for or subscribe to "Part Change Notices" for this display module, see the Product Notices tab on the product's webpage.

Variations
Slight variations (for example, contrast, color, or intensity) between lots are normal.

Volatility
This display module has volatile memory.

Disclaimer
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2. Introduction

The bidirectional CFA-RS232 Level Translator Board is a small printed circuit assembly that can be mounted on a compatible CFA Intelligent LCD module (also known as CFA module in this datasheet). It has a 16-pin female connector "H2" that mates with the male 16-pin connector "H1" on the back of compatible modules.

Less than one inch high and a little over one inch wide, the CFA-RS232 is an easy way to add "full swing" RS232 serial interface for compatible modules. This add-on peripheral converts compatible modules that have "logic level, inverted" serial interface to "full swing" RS232 serial interface.

- Overall dimensions are 28.45 (W) mm x 25.15 (H) mm (1.10" (W) x 0.99")
- Weight is 6 grams
- The CFA-RS232 has an SIPEX SP3220EEY-L driver/receiver pair

3. Differences Between Serial Interfaces

Both of the serial interfaces used in our compatible CFA modules have firmware that bring the two UART pins (Tx & Rx), of the module's micro-controller to its "H1" connector. The CFA-RS232 converts the 0v to +5v (logic level, inverted), Rx and Tx signals from the module's micro-controller to RS232 levels.

"Logic Level, Inverted" Serial

The CFA module exposes the UART Tx & Rx (logic level, inverted, 0v to 3.3v nominal) signals on pin 1 and pin 2 of the CFA module expansion connector H1. If your embedded processor is in close physical proximity to the CFA module, you can cable its UART Rx and Tx pins directly to the CFA module's Tx and Rx pins. No RS232 level translators are required on either end.

"Full Swing" RS232 Serial

Bidirectional 9600 / 19200 / 115200 baud ESD protected RS232 is provided when you customize your CFA module with a mounted CFA-RS232 Level Translator Board. This interface is the correct choice if your embedded controller or host system has a "real" RS232 serial port (-5v to +5v "full swing" serial interface) available.

4. CFA-RS232 Shipped Installed

The CFA-RS232 is pre-installed when you order a CFA635 Intelligent LCD Module. When you order a CFA735 or CFA835 Intelligent LCD Module you can order a CFA-RS232 when you select "Customize and Add to Cart".
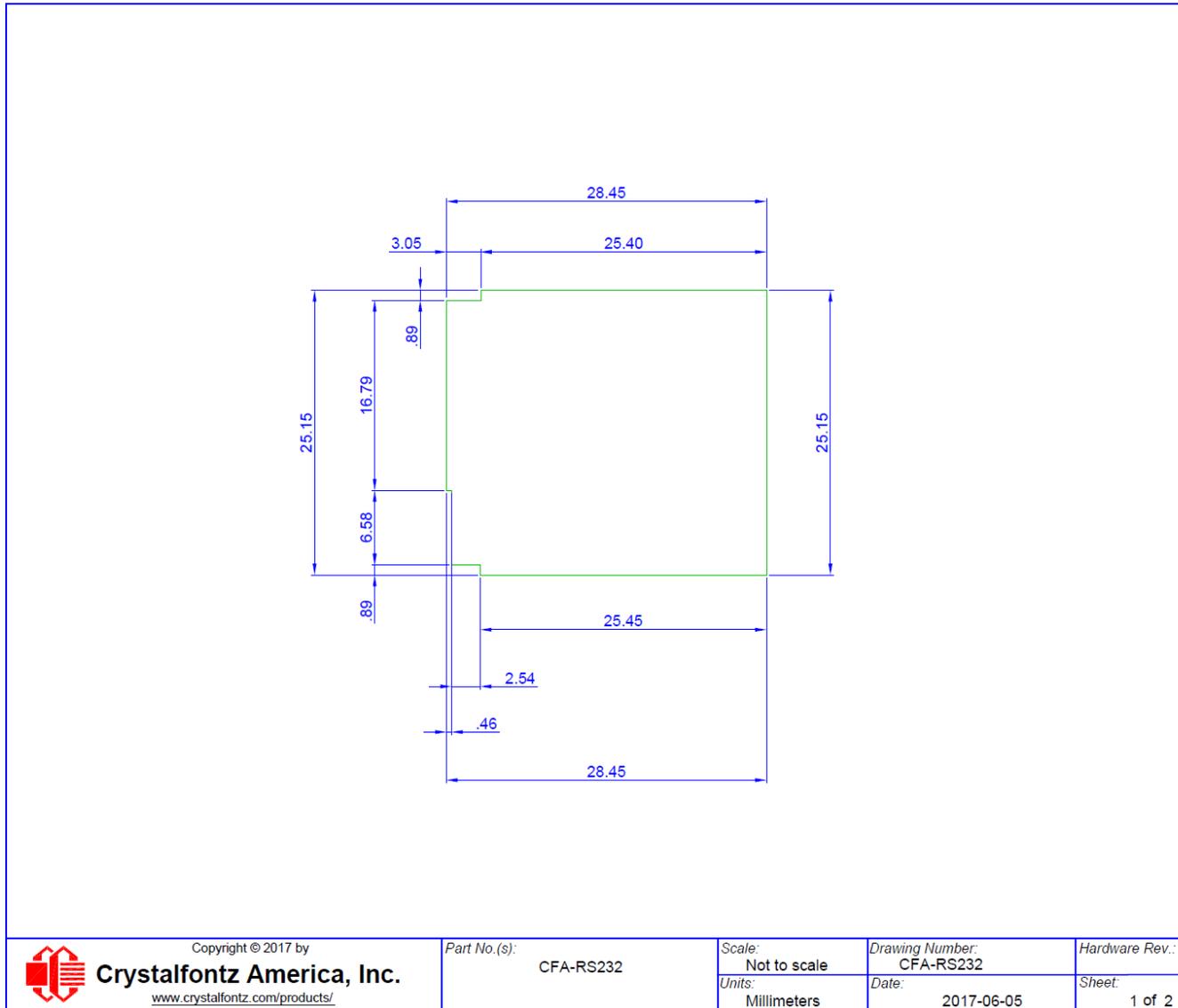
5. CFA-RS232 Shipped Separately

The CFA-RS232 Level Translator Board can also be used with other 3.0 to 5.0 volt devices. Sold as a separate item, the CFA-RS232 can interface between your host (any micro-controller), and your device with compatible connectors.

Fully assembled, the CFA-RS232 comes ready to connect with all three headers pre-installed. The connectors are widely available.
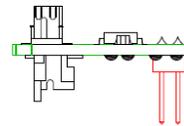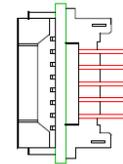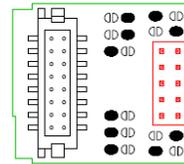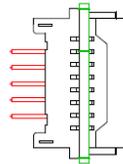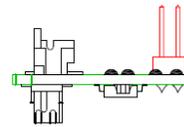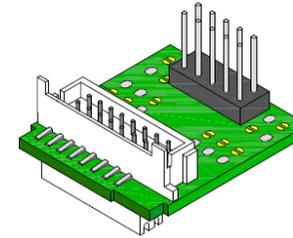
NOTE: Be sure to align the pins correctly when connecting the CFA-RS232 to your CFA module.

6. Mechanical Drawing

	Copyright © 2017 by	Part No.(s):	Scale: Not to scale	Drawing Number: CFA-RS232	Hardware Rev.:
	Crystalfontz America, Inc. www.crystalfontz.com/products/	CFA-RS232	Units: Millimeters	Date: 2017-06-05	Sheet: 1 of 2

Mechanical Drawing, Cont.

FOR ILLISTRATON PURPOSES ONLY

	Part No.(s):	Scale:	Drawing Number:	Hardware Rev.:
Copyright © 2017 by **Crystalfontz America, Inc.** www.crystalfontz.com/products/	CFA-RS232	Not to scale	CFA-RS232	v1.1
		Units: N/A	Date: 2017-06-05	Sheet: 2 of 2

7. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltages for Logic	V_{DD}	+3.3	5.5	V
Operating Temperature	T_{OP}	-20	70	°C
Storage Temperature	T_{STG}	-30	80	°C
Humidity Range (non-condensing)	RH	10	90	%
RS232 Input Pin	V_{RX}	-25	25	V
RS232 Output Pin	V_{TX}	-13	13	V

Notes:
(1) *These are stress ratings only. Extended exposure to the absolute maximum ratings listed above may affect device reliability or cause permanent damage.*
(2) *Changes in temperature can result in changes in contrast.*
(3) *Functional operation should be restricted to the limits in the DC Characteristics table below.*

8. DC Characteristics

Specification	Symbol	Min	Typical	Max
J1: Pin 3 Input Voltage Range (R_X)	V_{IH}	-25v		+25v
H2: Pin 1, Pin 2, Input High Voltage	V_{IH}		+1.8v	+2.4v
H2: Pin 1, Pin 2, Input Low Voltage	V_{OL}	+0.8v	+1.5v	
J1: Pin 2 Output Voltage Swing (T_X)	V_{OL}	± 5.0 v	± 5.4v	

9. Connection Information

Connection of CFA-RS232 to CFA Module:

- Connect the H2 of the CFA-RS232 into H1 of the CFA Intelligent LCD Module
- Connections that you would normally make to H1 of the CFA Intelligent LCD Module can now be made at the H1 connector of the CFA-RS232
- J1 of the CFA-RS232 connects to the RS232 port of your host system

H2 on CFA-RS232 connects to H1 on CFA Intelligent LCD Module

H1 on CFA-RS232 used for GPIO or ATX

Top of CFA-RS232

Bottom of CFA-RS232

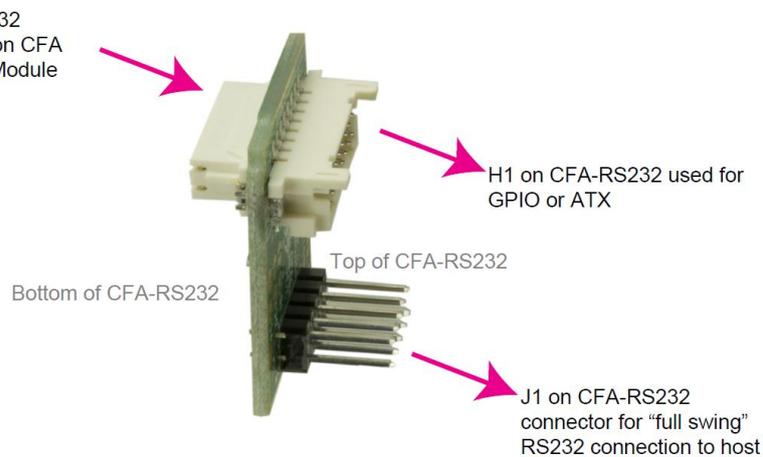J1 on CFA-RS232 connector for "full swing" RS232 connection to host

Figure 1. CFA-RS232 Level Translator

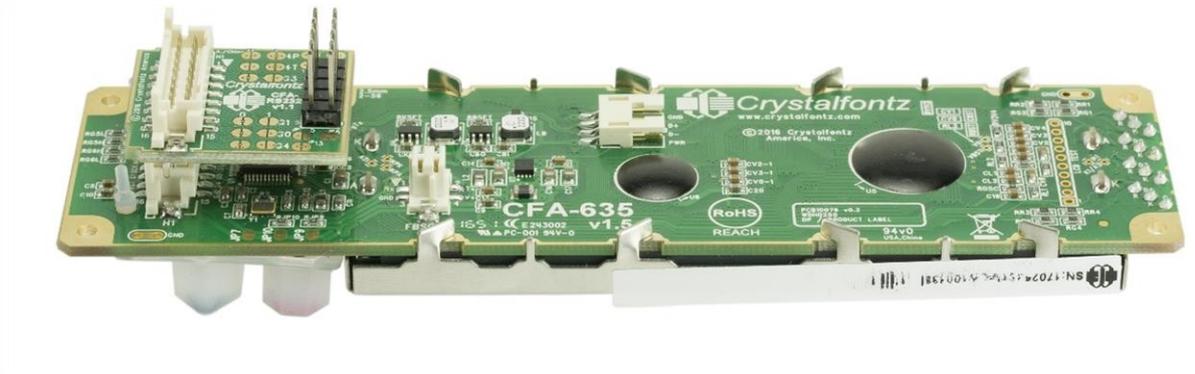Figure 2. Angled View of CFA-RS232 Level Translator Mounted on CFA Module

Figure 3. Side View of CFA-RS232 Level Translator Mounted on CFA Module

10. CFA-RS232 H1 Pin Assignments When Mounted to CFA Module

When the CFA-RS232 is connected to a CFA Intelligent LCD Module, H1 on CFA-RS232 passes through the power, ground, and GPIO/ATX pins from the CFA module. You may make a mating cable for the CFA-RS232 H1 by using the following parts:

- 16-position housing: Hirose DF11-16DS-2C / Digi-Key H2025-ND.
- Terminal: Hirose DF11-2428SC / Digi-Key H1504-ND.
- Pre-terminated interconnect wire: Hirose / Digi-Key H3BBT-10112-B4-ND (typical).

Below is a photo that shows the power, ground, and GPIO/ATX pins available on the CFA-RS232 H1.
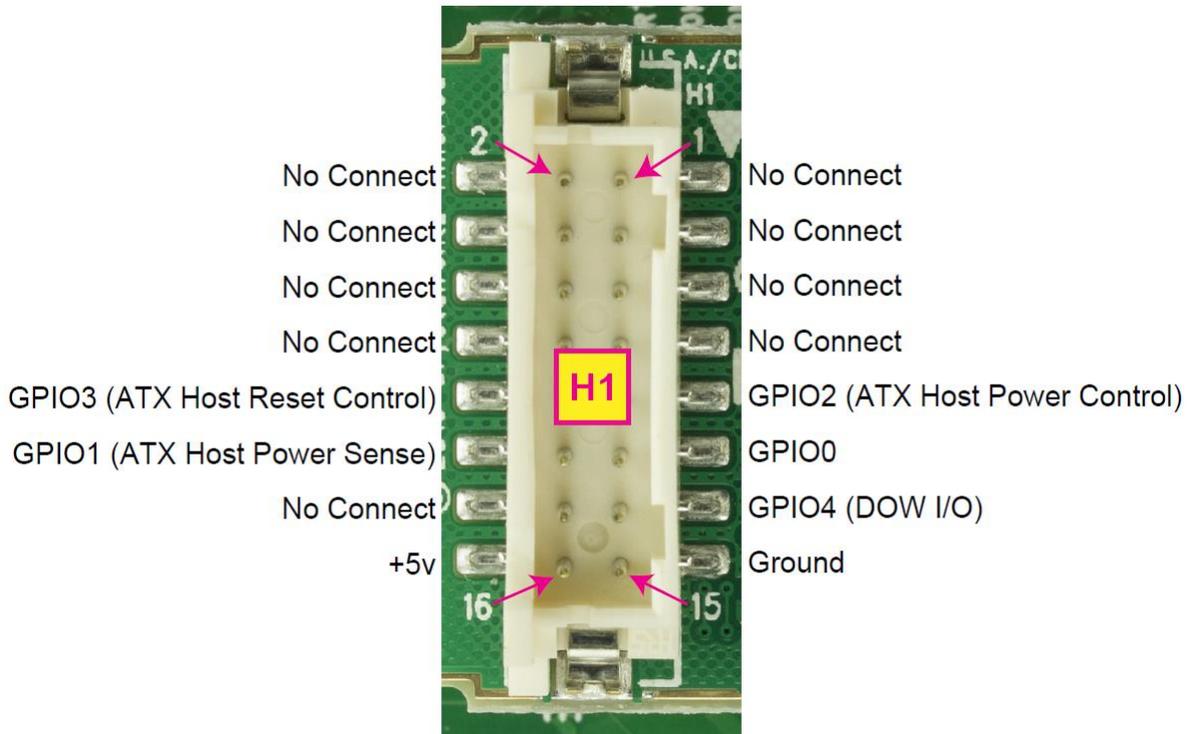

Figure 4. CFA-RS232 H1 Pin Assignments When Mounted to CFA Module

11. CFA-RS232 J1 Pin Assignments

J1 of the CFA-RS232 is used to make the RS-232 and power connections to your host.

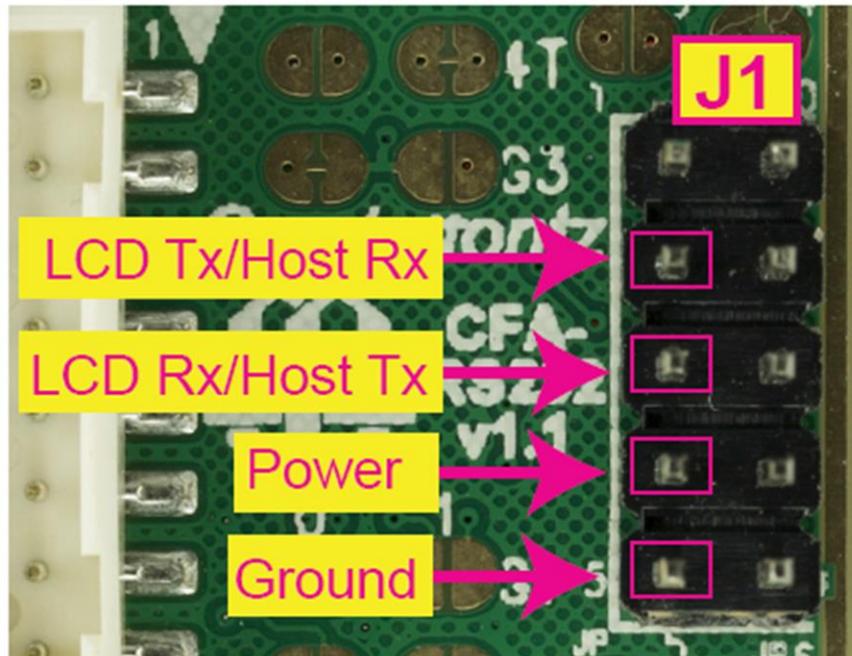Below is a photo that shows the power, ground, and RS232 Rx / RS232 TX pins on the CFA-RS232 J1 connector.

Figure 5. CFA-RS232 J1 Pin Assignments

12. Power Connection to Host

Choose one of these methods to supply power to the CFA Intelligent LCD Module:

Use a WR-PWR-Y24 cable or other cable / connection to provide power through H1 on the CFA-RS232 level translator (typical of a PC or server installation).

or

Supply power through pin 4 of J1 on the CFA-RS232 level translator as shown in the photo below. To enable +5v to be supplied through J1, jumper JP13 is closed on the CFA-RS232 by default.

> For embedded systems or high-volume production applications where you would like to minimize connections, you may want to use a single cable to carry both CFA-RS232 communications and power. The +5v power can be supplied through connector J1 on the CFA-RS232 level translator, allowing a single cable to contain both power and data connections.
>
> The four connections needed to operate the CFA module are on a single column of pins on J1 that allows a single 0.1-inch spacing 4-conductor cable to connect between the CFA module and your embedded system.

Pin 16 on H1 of the CFA-RS232 may be used to supply power to the CFA Intelligent LCD Module.
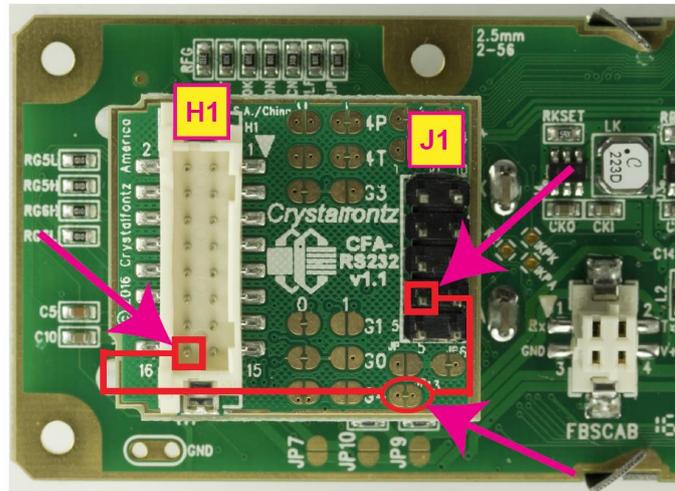
JP13 is closed by default, allowing the module to be powered by pin 4 on J1.

Figure 6. CFA Module Power Connection to Host Through H1 or J1 of CFA-RS232

13. Recommended Cables

Below is a list of some of the cables we offer to make it easy to integrate the CFA Intelligent LCD Module into your system. Please note that cable lengths are approximate.

Crystalfontz Cable	Image	Description All Cables Are RoHS Compliant
WR-232-Y08 ~27 inches		Use this ribbon cable to supply communications. Connect cable's 10-pin female connector to the module's J_RS232 male connector. Connect cable's RS232 DB9 9-pin female connector to host's DB9 9-pin male serial port. Default or alternate motherboard RS-232 pinouts can be accommodated by changing jumpers on the CFA635.
WR-232-Y22 ~26 inches		Use this cable to supply communications. Connect one of the 10-pin female connectors to the module's' J_RS232 10-pin male connector. Connect cable's second 10-pin female connector to host's motherboard 10-pin male connector. This cable supports standard or alternate pinout motherboard RS-232 connections without changing jumpers on the module.
WR-232-Y23 ~26 inches		Connect the cable's female connector to the CFA-RS232's "J1" 10-pin connector. Connect the cable's RS232 DB9 9-pin female connector to your host's external 9-pin serial port.
WR-PWR-Y24 ~3 ft. 1.95 inches		This cable is used to supply power to the CFA module directly from a PC power supply's "hard-drive" connector, rather than the normal USB power.