FORTEC ELEKTRONIK AG

DATA DISPLAY GROUP

Datasheet

IF392

LVDS to TTL/FFC interface with integrated BLU driver
Touch interface (USB/Serial)

ZU-10-xxx

Version 1.13

22.07.2016

Table of Contents

1 Revision History

Date	Rev.No.	Description	Resp.
05.23.2012	1.00	Initial version	AL1
06.26.2012	1.01	Added support for LCD, updated product no.	AL1
06.03.2013	1.02	Updated pinouts	AL1
27.06.2013	1.03	Added electrical specifications	WW1
28.06.2013	1.04	Added panel assembly table	AL1
01.07.2013	1.05	Added RN and Rset size	WW1
02.08.2013	1.06	Correct Rset size, added default note	SW1
30.08.2013	1.07	Added board typs	SW1
05.09.2013	1.08	Changed Panel Name (Page 12)	DF1
23.10.2013	1.09	AA050MG01* removed	GÖ1
30.01.2014	1.10	Obsolete panels removed	SW1
04.11.2015	1.11	GKCY43SNBH2E0 added	CS3
21.07.2016	1.12	GKTV57NNAD1E0 added	ES2
22.07.2016	1.13	V bklt for GKTV57NNAD1E0 added	ES2

2 Overview

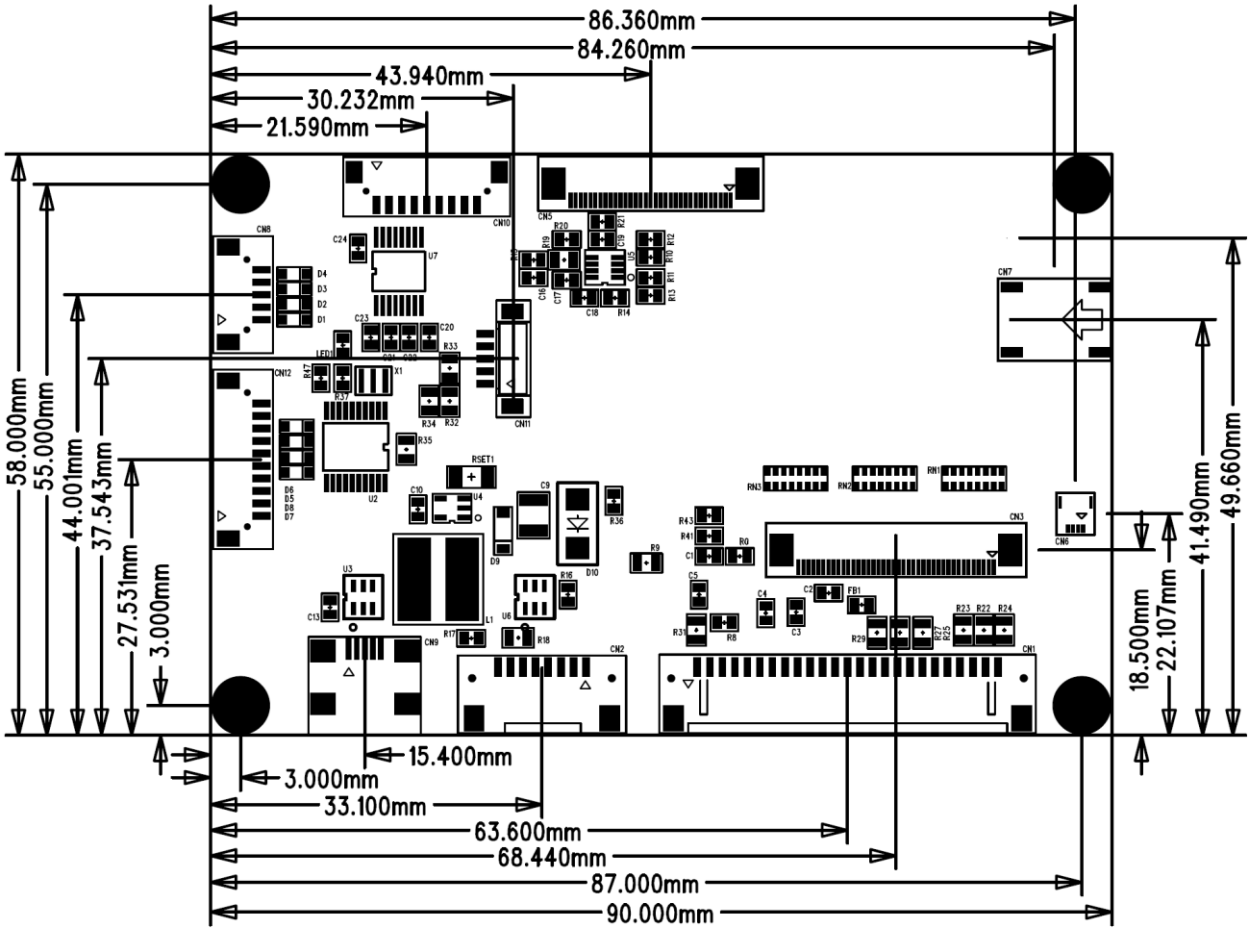
IF-392 provides a LVDS interface, LED converter, and resistive touch controller with optional USB or serial interface for the TTL LCD's with a flat flex cable. The IF392 will provide the user with standard backlight controls of backlight enable and backlight dimming control. For LCD's with an available stand-by mode for conserving power and scan direction control signals, the IF392 provides an interface to these features as well. It also supports 18 or 24 bpp inputs and up to 4 LVDS input channels. It also boasts a flexible on-board resistive touch controller, capable of supporting 4, 5, or 8 wire touch screens, with USB or serial connectivity, and available driver support for Windows, Linux, and embedded architectures.

2.1 Features

- 18/24 bit LVDS input support for 18/24bit LVTTL LCD's
- Configurable On-board LED converter
- Backlight enable and dimming control signals
- Supports Analogue and PWM backlight dimming
- Analogue input to PWM output conversion: for SBC's with no PWM dimming
- 4/5/8 Wire Resistive Touch Screen Support
- USB or Serial RS232 (optional) Touch Interface
- LCD Support IF392M:
  AA050MG01
  AA050MG01-T1
- LCD Support IF392:
  ET043003DM6 (default assembly)
  GKCY43SNBH2E0
  GWTW50SNCH3E0

(Refer to section 5.3.2 for LCD reference table)

3 Mechanical Overview



Board sizes: 90 x 58mm

4 Connector Descriptions

4.1 Connector Types

No	Description	Part Number	Manufacturer	Notes
CN1	LVDS Input	DF14-25P-1.25H	Hirose	LVDS Input, VCC, BKLT CNTRL
CN2	Backlight I/O	DF13-8P-1.25H	Hirose	Bklt Pwr/Enable/Dimming, PWM Out, LED Pwr Out
CN3	ET043 TTL Output	4-1734592-0	TE Connectivity	40POS TTL FFC, 0.5mm, BTM Contacts
CN4	Reserved			
CN5	5.7" FFC TTL Output	3-1734839-3	TE Connectivity	33POS TTL FFC, 0.5mm, TOP Contacts
CN6	ET043 LED Output	046277004001883+	Kyocera/AVX	LED Backlight
CN7	5.7" LCD LED Output	SM02B-BHSS-1-TB(LF)(SN)	JST	LED Backlight
CN8	4-Wire Touch Input	DF13-5P-1.25H	Hirose	
CN9	USB-Mini-B Touch	UX60-MB-5ST	Hirose	
CN10	RS232 Touch	DF13-9P-1.25H	Hirose	
CN11	Touch Programming	DF13C-5P-1.25V(20)	Hirose	
CN12	5/8-Wire Touch Input	DF13-10P-1.25H(20)	Hirose	

4.2 Pin Assignments

CN1: LVDS & Power Input		
Pin	**Signal**	**Description**
1	VCC	+3.3V Supply Voltage
2	VCC	+3.3V Supply Voltage
3	GND	Ground
4	GND	Ground
5	RX0+	LVDS Channel 0 -
6	RX0-	LVDS Channel 0+
7	RX1+	LVDS Channel 1-
8	RX1-	LVDS Channel 1+
9	RX2+	LVDS Channel 2-
10	RX2-	LVDS Channel 2+
11	RX3+	LVDS Channel 3-
12	RX3-	LVDS Channel 3+
13	CLK+	LVDS Clock -
14	CLK-	LVDS Clock +
15	GND	Ground
16	DISP	Display On/Off Ctrl, L=Standby; H=Normal
17	L/R (SC)	Scan Control Left/Right (Scan Control)
18	U/D	Scan Control Up/Down
19	VIN	Backlight Power Supply
20	VIN	Backlight Power Supply
21	GND	Ground
22	GND	Ground
23	BKLT_EN	Backlight Enable
24	BRT_ANA	Analog Bklt Dimming, (min)0 – 5V(max)
25	BRT_PWM	PWM Bklt Dimming, 0 – 100% Duty

CN2: Backlight Control / PWM out			
Pin	**Signal**	**Description**	
1	VIN	Backlight Power Supply	
2	GND	Ground	
3	BKLT_EN	Backlight Enable	
4	BRT_ANA	Analog Bklt Dimming, (min)0 – 5V(max)	
5	BRT_PWM	PWM Bklt Dimming, 0 – 100% Duty	
6	VLED+	LED Drive	
7	VLED-	LED Return	
8	VBR_PWM	PWM Output, generated from BRT_ANA	

CN3: 40POS FFC TTL Output			
Pin	**Signal**	**Description**	
1	FFC40_1	GND / VLED-	
2	FFC40_2	GND / VLED+	
3	FFC40_3	VCC / GND	
4	FFC40_4	VCC	
5	R0	Red Data Signal (LSB)	
6	R1	Red Data Signal	
7	R2	Red Data Signal	
8	R3	Red Data Signal	
9	R4	Red Data Signal	
10	R5	Red Data Signal	
11	R6	Red Data Signal	
12	R7	Red Data Signal (MSB)	
13	G0	Green Data Signal (LSB)	
14	G1	Green Data Signal	
15	G2	Green Data Signal	
16	G3	Green Data Signal	
17	G4	Green Data Signal	
18	G5	Green Data Signal	
19	G6	Green Data Signal	
20	G7	Green Data Signal (MSB)	
21	B0	Blue Data Signal (LSB)	
22	B1	Blue Data Signal	
23	B2	Blue Data Signal	
24	B3	Blue Data Signal	
25	B4	Blue Data Signal	
26	B5	Blue Data Signal	
27	B6	Blue Data Signal	
28	B7	Blue Data Signal (MSB)	
29	GND		
30	CLK	Clock signal for sampling catch data	
31	DISP	Display on/off (Low: off, High: on)	
32	HS	Horizontal Sync Signal	
33	VS	Vertical Sync Signal	
34	FFC40_34	DENA / NC	
35	NC	No Connect	
36	FFC40_36	No Connect / GND	
37	NC	No Connect	
38	NC	No Connect	
39	FFC40_39	VLED- / NC	
40	FFC40_40	VLED+ / NC	

CN4:	Reserved

CN5:	33POS FFC TTL Output	
Pin	**Signal**	**Description**
1	GND	Ground
2	CLK	Clock
3	HSYNC	Horizontal Sync Signal
4	VSYNC	Vertical Sync Signal
5	GND	Ground
6	R2	Red Data Signal (LSB)
7	R3	Red Data Signal
8	R4	Red Data Signal
9	R5	Red Data Signal
10	R6	Red Data Signal
11	R7	Red Data Signal (MSB)
12	GND	Ground
13	G2	Green Data Signal (LSB)
14	G3	Green Data Signal
15	G4	Green Data Signal
16	G5	Green Data Signal
17	G6	Green Data Signal
18	G7	Green Data Signal
19	GND	Ground
20	B2	Blue Data Signal (LSB)
21	B3	Blue Data Signal
22	B4	Blue Data Signal
23	B5	Blue Data Signal
24	B6	Blue Data Signal
25	B7	Blue Data Signal
26	GND	Ground
27	DENA	
28	VCC	+3.3V
29	VCC	+3.3V
30	L/R	Scan Control Left/Right
31	U/D	Scan Control Up/Down
32	N/C	No Connect
33	GND	Ground

CN6:	ET043 LED Backlight Output	
Pin	**Signal**	**Description**
1	VLED-	LED POWER -
2	VLED-	LED POWER -
3	VLED+	LED POWER +
4	VLED+	LED POWER +

CN7:	5.7" LCD-LED Backlight Output	
Pin	**Signal**	**Description**
1	VLED+	LED POWER +
2	VLED-	LED POWER -

CN8: 4-Wire Touch Input			
Pin	**Signal**	**Description**	
1	X+	X-Right	
2	Y+	Y-Down	
3	X-	X-Left	
4	Y-	Y-Up	
5	GND	Ground	

CN9: USB-Mini-B Touch Interface			
Pin	**Signal**	**Description**	
1	USBPWR	+5V USB	
2	D-	Data -	
3	D+	Data +	
4	NC	No Connect	
5	GND	Ground	

CN10: Serial RS232Touch Interface			
Pin	**Signal**	**Description**	
1	NC		
2			
3	TX		
4	NC		
5	RX		
6	NC		
7			
8	NC		
9	GND		

CN11: AR1100 Touch Programming			
Pin	**Signal**	**Description**	
1	TX	5V TTL	
2	RX	5V TTL	
3	VCC	3.3V	
4	NC		
5	GND	Ground	

CN12: 5/8-Wire Touch Input				
Pin	**Signal**	**5 Wire Touch**	**8 Wire Touch**	
1	X+	Lower-Right	X-Right	
2	Y+ (SY+)	Lower-Left	Y-Down Ref	
3	X-	Upper-Left	X-Left	
4	Y-	Upper-Right	Y-Up	
5	SX+	N/C	X-Right Ref	
6	(Y+)	N/C	Y-Down	
7	SX-	Common	X-Left Ref	
8	SY-	N/C	Y-Up Ref	
9	VCC	VCC	VCC	
10	GND	Ground	Ground	

5 Electrical Specifications

5.1 Operating Characteristics

Item	Condition	MIN.	TYP.	MAX.	Unit	Note
Power Supply						
Backlight Supply Voltage (VIN)	Touch via UART	3.135		5.25	V	
	Touch via USB	3.0		5.5	V	
VIN Supply Current (@3.3V)	Backlight off, touch via UART		22	34	mA	1, 3
	Backlight off, touch via USB		5	9	mA	2, 3
USB Supply Voltage (VBus)	Touch via USB	3.135		5.25	V	
USB Supply Current	Touch via USB		17	25	mA	2
LVDS Supply Voltage (VCC)		3.0	3.3	3.6	V	
VCC Supply Current	Board only	25	40	95	mA	4, 5
Control						
Backlight Control (BKLTEN, PWMIN)	Logic High	2		5.5	V	
	Logic Low	0		0.8	V	
Analog Dimming		0		3.3	V	
TTL UART TX (CN11 pin1)						
RS-232 UART TX (CN10 pin3)	Logic High	5	5.4		V	
	Logic Low	-5	-5.4		V	
RS-232 UART RX (CN10 pin5)	Logic High		1.5	2.4	V	VIN = 3.3V
			1.8	2.4	V	VIN = 5.0V
	Logic Low	0.6	1.2		V	VIN = 3.3V
		0.8	1.5		V	VIN = 5.0V

Notes:

1. Touch controller supplied via VIN
2. Touch controller supplied via USB VBus
3. Additional backlight power can be estimated by LED power requirement / 0.85 (efficiency is around 85%)
4. Add LCD module current
5. Current highly depending on pixel clock and configuration (slew rate)

5.2 Absolute Maximum Ratings

Item	Condition	MIN.	TYP.	MAX.	Unit	Note
Power Supply						
Backlight Supply Voltage (VIN)		-0.3		+6.0	V	
LVDS Supply Voltage (VCC)		-0.3		+4.0	V	6
Control						
Backlight Control (BKLTEN, PWMIN)		-0.5		+6.5	V	
TTL UART lines (CN11)		-0.3		VIN + 0.3	V	
TTL UART TX (CN11 pin1)		-25		+25	mA	
RS-232 TX (CN10 pin3)		-13.2		+13.2	V	
RS-232 RX (CN10 pin5)		-25		+25	V	

Notes:

6. Also check LCD module ratings!

6 Physical Specifications

6.1 Environmental Conditions

Operating Temperature: -30°C to +80°C
Storage Temperature: -30°C to +80°C

7 Interfaces

7.1 LVDS-to-TTL Converter

- Supports 18/24-bit LVDS Input, 4 input LVDS Channels
- Resolution support up to 1024x600
- Supports Single 3.3V Power Supply; VDDIO Allows 1.8V – 3.3V for Flexible Panel Support
- 28 bits single-ended low voltage TTL synchronous data.

7.1.1 LCD Support Reference

LCD P/N	ET043003DM6 (default assembly)	SG-01-009 GWTW50SNCH3E0 (5,0", 3,3V, LED)	SG-01-008 GKCY43SNBH2E0 (4,3", 3,3V, LED)
Board type	IF392-00	IF392-04	IF-392-10
Manuf.	Emerging Display	Solomon Goldentek	Solomon Goldentek
Size	4.3"	5.0"	4,3"
Resolution	480x272	800x480	480x272
Brightness	400 nits	700 nits	1000 nits
TTL Conn.	CN3, 40POS FFC	CN3, 40POS FFC	CN3, 40POS FFC
TTL Config.	Install RN1 (8 Res. Array 0R0, 1506)	Install RN2 (8 Res. Array 0R0, 1506)	Install RN3 (8 Res. Array 0R0, 1506)
LED Conn.	CN6	CN3	CN3
Rset Config. (LED, 1206)	2.74Ω	4.75Ω	4.75Ω
Color Depth	24 bit	24 bit	24 bit
Scan Direction	-	-	-
Standby	Yes	Yes	Yes
Touch	-	-	-
Vbklt	3,3V	3,3V	3,3V

LCD P/N	SG-01-011 GKTV57NNAD1E0		
Board type	IF392-07		
Manuf.	Solomon Goldentek		
Size	5.7"		
Resolution	640x480		
Brightness	900 nits		
TTL Conn.	CN5, 33POS FFC		
TTL Config.	Install resistors R8, R14 (100R, 0603) R20, R21 (10K, 0603) 1)		
LED Conn.	CN7		
Rset Config. (LED, 1206)	0.91Ω		
Color Depth	18 bit		
Scan Direction	Up/Down & Left/Right		
Standby	-		
Touch	-		
Vbklt	5,0V 2)		

Notes:

1) R20 sets the U/D signal (CN1 Pin18, CN5 Pin31) LOW. R21 sets the L/R signal (CN1 Pin17, CN5 Pin31) HIGH. Additional, the both signals can be control by external CMOS/TTL outputs like Prisma-IIIa's LVDS-Optional signals available on the connector CON6.

2) Please use PrismaECO-IV or Prisma-IIIa for providing the 5,0V Backlight Voltage.

7.2 Touch Controller

This interface board utilizes the Microchip AR1100 resistive touch controller. This is a high performance, universal, USB &RS-232 touch controller. It is capable of both USB mouse and USB Digitizer modes. It can support 4-, 5-, or 8- wire analog resistive touch screens.

8 News and Updates

The latest version of documents, drivers and software packages can be found at:

German Site http://www.datadisplay-group.de/service/downloads/

English Site http://www.datadisplay-group.com/service/downloads/

Our company network supports you worldwide with offices in Germany, Great Britain, Turkey and the USA. For more information please contact:

DATA DISPLAY GROUP

A FORTEC GROUP MEMBER

Distec GmbH
Augsburger Str. 2b
82110 Germering
Germany

Phone: +49 (0)89 / 89 43 63-0
Fax: +49 (0)89 / 89 43 63-131
E-Mail: info@datadisplay-group.de
Internet: www.datadisplay-group.de

FORTEC Elektronik AG
Lechwiesenstr. 9
86899 Landsberg am Lech
Germany

Phone: +49 (0)8191 / 911 72-0
Fax: +49 (0)8191 / 217 70
E-Mail: sales@fortecag.de
Internet: www.fortecag.de

Display Technology Ltd.
5 The Oaks Business Village
Revenge Road, Lordswood
Chatham, Kent, ME5 8LF
United Kingdom
Phone: +44 (0)1634 / 67 27 55
Fax: +44 (0)1634 / 67 27 54
E-Mail: info@displaytechnology.co.uk
Internet: www.datadisplay-group.com

Apollo Display Technologies, Corp.
87 Raynor Avenue,
Unit 1Ronkonkoma,
NY 11779
United States of America
Phone: +1 631 / 580-43 60
Fax: +1 631 / 580-43 70
E-Mail: info@apollodisplays.com
Internet: www.apollodisplays.com

Sales Partner:

DATA DISPLAY BİLİŞİM TEKNOLOJİLERİ İÇ VE DIŞ TİCARET LİMİTED ŞİRKETİ
Barbaros Mh. Ak Zambak Sk. A Blok D:143
34376 Ataşehir / Istanbul
Turkey
Phone: +90 (0)216 / 688 04 68
Fax: +90 (0)216 / 688 04 69
E-Mail: info@data-display.com.tr
Internet: www.data-display.com.tr