anglia displays

www.anglia-displays.com

Colour TFT • Colour STN • Mono Graphic • Alphanumeric • Custom Displays

Inverters • Cable & Connectors • Driver ICs • Technical Support • Useful Data

Welcome to the Displays brochure from

anglia displays

This brochure has been compiled in order to present our extensive and diverse range of LCDs from Hitachi and Bona Fide, which we are able to support with a comprehensive portfolio of essential accessories. These include Hitachi inverters, Solomon Systech & IDT driver ICs and appropriate cables & connectors from Hirose, JAE, Taicom and Tyco Electronics.

In addition, Anglia Displays is able to provide full technical support and advice together with starter kits and boards to assist customers through their design-in process.

About our suppliers

Displays

HITACHI Inspire the Next

BONA

Hitachi's monochrome and colour graphic LCDs feature wide temperature range operation, long life cold cathode fluorescent light (CCFL) and high brightness white LED backlights, touch panel options, low power consumption and industry leading quality and maximum flexibility for customers.

Bona Fide Technology is an LCD manufacturer who provides a wide range of standard and custom made LCD panels and LCD modules in different technologies such as TN, HTN, STN, FSTN, CSTN and TFT.

Drivers

SOLOMON SYSTECH

IDT

Solomon Systech is a leading fabless semiconductor company specialising in proprietary IC products that enable sophisticated display applications such as mobile phones, handheld devices and LCD TVs. Products include STN/CSTN/TFT LCD driver controllers, OLED driver controllers, graphics controllers and image processors for mobile displays, TFT drivers and timing controllers for large displays.

IDT (Integrated Device Technology, Inc.) specialises in the design and development of network and timing integrated circuit solutions for communications, consumer and computing applications. Among the company's portfolio of timing solutions are products for clock generation, distribution, recovery and jitter attenuation. The IDT offerings also consist of network search engines, standard-based serial switching devices, flow-control management and touchscreen controller ICs.

Cable & Connectors

HRS HIROSE

JAE

TAICOM

Tyco Electronics
Our commitment. Your advantage.

Hirose manufactures a wide range of connectors for applications that include automotive, digital cameras and digital video cameras, mobile phones and PDAs, notebook PCs, DVD recorders, plasma display panels as well as a range of RF and microwave components.

JAE Europe is one of the world's leading connector manufacturers and provides a range of products which are suited to the industrial and datacom markets. These include high-density, board to board, board to wire, fine pitch, circular and I/O connectors.

Taicom's very extensive product portfolio comprises of standard commodity connectors that includes a large family of PCB interconnects such as board to board, FFC/FPC, headers and sockets, modular and wire to board. Taicom also manufactures ranges of cables and accessories and battery connectors and holders.

Tyco Electronics is one of the industry's most comprehensive sources of connectors encompassing numerous leading brand names such as AMP, Augat, Microdot and HTS. The range caters for almost every conceivable application in a wide variety of markets including computing networking, portable electronics, consumer goods, military, rail, aerospace, industrial and medical electronics.

About us

Anglia Displays is a member of the Anglia group of companies. Our main contact details are as follows:

Tel: +44 (0)1945 47 46 45 **Email:** info@anglia-displays.com

Address: Sandall Road, Wisbech, Cambs PE13 2PS U.K.

For the very latest information on our entire range of LCDs and accessories, please visit our website : **www.anglia-displays.com**

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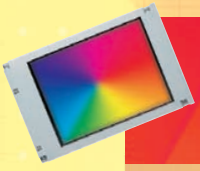

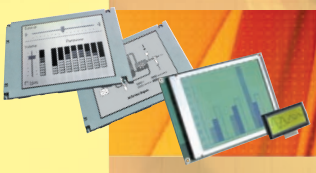

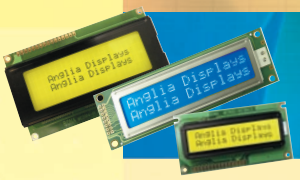

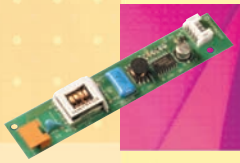

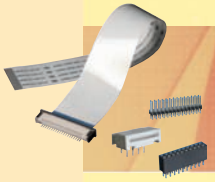

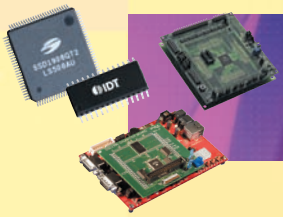

Colour TFT Graphic Displays - Active

2.2” to 15.4” Screen Sizes

Features

- **Excellent Optical Performance**
  Advanced LCD drivers and Hitachi’s black matrix colour filters provide high contrast, reduced shadowing and excellent colour saturation.
- **Wide Screen Formats Available**
  Various display sizes are available in wide screen 16:9 formats WVGA and WXGA.
- **Wide Viewing Angle Types**
  In-Plane Switching (IPS) technology offers wide viewing angle types of up to 176°.
- **Touchscreen Versions**
  4-wire analogue resistive touchscreens with anti-glare and non-scratch finish.
- **Backlight Variants**
  White LED or High Bright, Super High Bright and long life CCFL backlights.
- **Single Power Source**
  Integrated DC/DC converter enables use of a single 3.3V or 2.8V power supply for the majority of the displays.
- **Low Power Consumption**
  The combination of low voltage LC materials and Hitachi’s advanced LCD drivers featuring High Frequency Amplitude Selection (HIFAS) results in significantly reduced power consumption.
- **Compact Dimensions**
  Drawing on Hitachi’s experience as a leading supplier of Notebook PC displays, all modules are extremely compact.

Introduction

An extensive range of Colour TFT modules from Hitachi designed specifically to display active graphics by delivering excellent optical performance. Comprising of screen sizes from 2.2” to 15.4”, the range provides numerous options extending from wide screen WVGA and WXVGA versions through to wide viewing angle, high bright and analogue touchscreen types. With their low power consumption and compact dimensions they will suit many varied market environments and applications.

Specification

Optical

All models are transmissive mode. Backgrounds are white unless otherwise stated.
An anti-glare finish is provided on all screen sizes of 7” and above.

Mechanical

Touchscreen adds 0.9 to 1.7mm to dimension ‘D’.

Environmental

All models are suitable for use over the -20 to +70°C industrial temperature range except TX16D11VM2CAA (0 to 50°C).
The automotive version TX18D57VM2BAA operates over an extended temperature range of -30 to +80°C.

Applications

- Portable Terminals
- EPOS
- Internet Terminals
- MMI
- Navigation Systems
- Process Control

Controller/Driver ICs

Solomon Systech LCD graphic controllers and an IDT touchcscreen controller are available for Hitachi displays.
See page 18 for details.

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Colour TFT Graphic Displays - Active

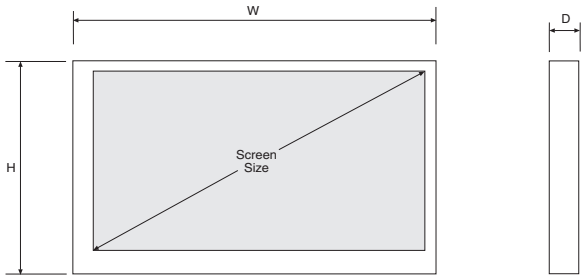
- Excellent Optical Performance
- Wide Screen Formats Available
- Wide Viewing Angle Types
- Touchscreen Versions
- Backlight Variants
- Single Power Source
- Low Power Consumption
- Compact Dimensions

Fully supported by availability of essential accessories:

- Inverters
- Cables
- Connectors

Plus Development Boards

Dimensions (mm)



Screen Size	Resolution	Module Dimensions W x H x D (mm)	Backlight	Brightness Non Touch Version	Contrast	Supply Voltage	Features	Part Number	Touchscreen Version	Essential Accessories (see pages 14-17)				
										Inverter	Cable & Connector Codes			
2.2”	240 x 320 (QVGA)	33.84 x 56.1 x 3.55	White LED	220 cd/m2	250:1	2.8V	Wide Angle (IPS), Black Background	TX06D57VM0AAA	–	Not required	–	GU	–	–
2.7”	240 x 320 (QVGA)	50.54 x 68.62 x 2.6	White LED	420cd/m2	300:1	3.0V	High Bright, Timing Control	TX07D09VM1CBB	TX07D09VM1CAB	Not required	–	GX	–	–
3.5”	240 x 320 (QVGA)	64.0 x 86.0 x 4.2	White LED	430 cd/m2	300:1	3.0V	High Bright	TX09D40VM3CBA	TX09D40VM3CAA	Not required	BW	HW	–	–
3.5”	240 x 320 (QVGA)	64.0 x 86.0 x 4.2	White LED	400 cd/m2	300:1	3.3V	High Bright	TX09D70VM1CBA	TX09D70VM1CEA	Not required	BW	HW	–	–
3.5”	240 x 320 (QVGA)	64.0 x 86.0 x 7.17	White LED	400 cd/m2	300:1	3.3V	High Bright, Timing Control	TX09D70VM1CDA	TX09D70VM1CCA	Not required	BV	HV	–	–
5.7”	320 x 240 (QVGA)	131.0 x 102.0 x 10.9	CCFL	350 cd/m2	350:1	3.3V	Timing Control	TX14D12VM1CBA	TX14D12VM1CAA	INVC695	BV	HV	–	–
5.7”	320 x 240 (QVGA)	131.0 x 102.0 x 10.9	White LED	350 cd/m2	350:1	3.3V	Timing Control	TX14D12VM1CBC	TX14D12VM1CPC	Not required	BV	HV	UB	–
5.7”	320 x 240 (QVGA)	131.0 x 102.0 x 10.9	CCFL	600 cd/m2	350:1	3.3V	Super High Bright, Timing Control	TX14D12VM1CBB	TX14D12VM1CAB	INVC695	BV	HV	–	–
5.7”	320 x 240 (QVGA)	167.0 x 109.0 x 9.2	CCFL	350 cd/m2	350:1	3.3V	50k hour CCFL, Timing Control	TX14D11VM1CBA	TX14D11VM1CAA	INVC617/657	BV	HV	–	–
5.7”	320 x 240 (QVGA)	167.0 x 109.0 x 9.2	CCFL	600 cd/m2	350:1	3.3V	Super High Bright	TX14D11VM1CBB	TX14D11VM1CAB	INVC617/657	BV	HV	–	–
5.7”	640 x 480 (VGA)	131.0 x 102.0 x 10.9	CCFL	350 cd/m2	350:1	3.3V	Timing Control	TX14D14VM1BAA	TX14D14VM1BBA	INVC695	BV	HV	–	–
6.2”	640 x 240	173.0 x 70.0 x 7.0	CCFL	350 cd/m2	200:1	3.3V	Timing Control	TX16D11VM2CBA	TX16D11VM2CAA	INVC659	BV	HV	–	–
7.0”	800 x 480 (WVGA)	165.0 x 106.0 x 10.5	CCFL	350 cd/m2	200:1	3.3V	–	TX18D16VM1CAA	TX18D16VM1CBA	INVC617/657	BV	HV	–	JC
7.0”	800 x 480 (WVGA)	165.0 x 106.0 x 10.5	CCFL	600 cd/m2	200:1	3.3V	Super High Bright	TX18D16VM1CAB	TX18D16VM1CBB	INVC617/657	BV	HV	–	JC
7.0”	800 x 480 (WVGA)	167.8 x 108.6 x 15.6	CCFL	600 cd/m2	450:1	3.3V	Super High Bright, Auto Temp	TX18D57VM2BAA	–	INV6617/657	BV	HV	–	–
8.0”	800 x 480 (WVGA)	189.0 x 120.0 x 10.5	CCFL	350 cd/m2	200:1	3.3V	–	TX20D16VM2BAA	TX20D16VM2BBA	INVC617/657	BV	HV	–	JC
8.0”	800 x 480 (WVGA)	192.0 x 123.5 x 10.7	CCFL	600 cd/m2	200:1	3.3V	Super High Bright	TX20D17VM2BAA	TX20D17VM2BBA	INVC617/657	BV	HV	–	JC
9.0”	800 x 480 (WVGA)	236.0 x 135.0 x 12.5	CCFL	400 cd/m2	400:1	3.3V	Wide Angle (IPS), Timing Control	TX23D12VM0CAA	–	*	BV	HV	–	–
10.4”	640 x 480 (VGA)	243.0 x 181.6 x 12.5	2 x CCFL	350 cd/m2	500:1	3.3V	–	TX26D55VM1CAA	–	1 x INVC655	BT	HT	–	–
12.0”	800 x 480 (WVGA)	283.0 x 173.8 x 12.4	2 x CCFL	450 cd/m2	350:1	3.3V	High Bright	TX31D55VM2BAA	–	1 x INVC783	BV	HV	–	–
12.1”	800 x 600 (SVGA)	280.0 x 210.0 x 13.0	2 x CCFL	400 cd/m2	500:1	3.3V	High Bright, LVDS Input	TX31D56VM2AAA	–	1 x INVC783	DM	KM	–	–
15.0”	1024 x 768 (XVGA)	330.0 x 260.0 x 17.0	4 x CCFL	350 cd/m2	500:1	3.3V	LVDS Input	TX38D55VM1AAA	–	1 x INVC784	DM	KM	–	–
15.4”	1280 x 800 (WXGA)	356.8 x 238.0 x 15.0	4 x CCFL	450 cd/m2	500:1	3.3V	High Bright, LVDS Input	TX39D55VM1BAA	–	1 x INVC784	DM	KM	–	–

Module dimensions include rear connectors

* Not currently available

Data Cable
Data Connector
Backlight Connector
Touchscreen Connector

See pages 15-17 for part numbers

Need to know more

A “Glossary of Terms” is provided on page 20 together with details of “Viewing Characteristics”.

Need technical support

See page 19 for details.
We’re here to help.

Colour STN Graphic Displays - Passive

5.7” to 7.5” Screen Sizes

Features

- **Excellent Optical Performance**
  Advanced LCD drivers and Hitachi’s black matrix colour filters provide high contrast, reduced shadowing and excellent colour saturation.
- **Touchscreen Versions**
  4-wire analogue resistive touchscreens with anti-glare and non-scratch finish.
- **Backlight Variants**
  Standard life or long life CCFL backlights.
- **Single Power Source**
  Integrated DC/DC converter enables use of a single 3.3V power supply. (Except SX19V010)
- **Low Power Consumption**
  Passive matrix LCDs have low power consumption and combined with Hitachi’s advanced LCD drivers results in significantly reduced power consumption.
- **Compact Dimensions**
  Drawing on Hitachi’s experience as a leading supplier of Notebook PC displays, all modules are extremely compact.

Introduction

A range of low power, low cost Colour STN (CSTN) passive matrix modules from Hitachi that include colour filters to deliver excellent optical performance. Various options are available, such as versions with analogue touchscreens, wide viewing angles and long life backlights, which when combined with their compact dimensions enable these displays to suit a wide variety of applications.

Specification

Optical

All models are transmissive mode. Backgrounds are white unless otherwise stated.

Mechanical

Touchscreen adds 0.9 to 1.7mm to dimension ‘D’.

Environmental

All models are suitable for use over the standard 0 to +50°C temperature range.
(Screen size 5.7” operates over 0 to +60°C)

Applications

- Portable Terminals
- EPOS
- Internet Terminals
- Navigation Systems
- Process Control

Controller/Driver ICs

Solomon Systech LCD graphic controllers and an IDT touchcscreen controller are available for Hitachi displays.
See page 18 for details.

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Colour STN Graphic Displays - Passive

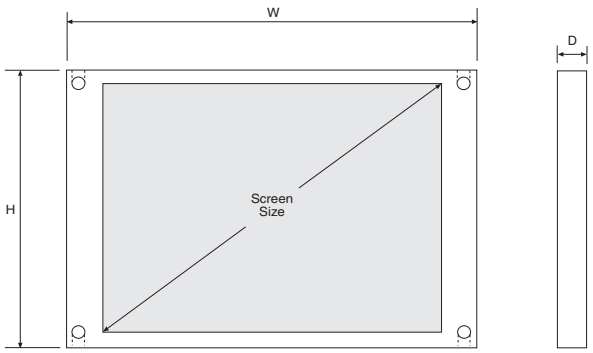
- Excellent Optical Performance
- Touchscreen Versions
- Backlight Variants
- Single Power Source
- Low Power Consumption
- Compact Dimensions

Fully supported by availability of essential accessories:

- Inverters
- Cables
- Connectors

Plus Development Boards

Dimensions (mm)



Screen Size	Resolution	Module Dimensions W x H x D (mm)	Backlight	Brightness Non Touch Version	Contrast	Supply Voltage	Features	Part Number	Touchscreen Version	Essential Accessories (see pages 14-17)				
										Inverter	Cable & Connector Codes			
5.7"	320 x 240 (QVGA)	167 x 109 x 8.9	CCFL	200cd/m2	40:1	3.3V	50k hour CCFL, DC/DC, Wide Viewing Angle	SX14Q004	SX14Q004-ZZA	INVC667	–	JJ	–	JC
5.7"	320 x 240 (QVGA)	167 x 109 x 8.9	White LED	200cd/m2	40:1	3.3V	Negative Mode, Wide Viewing Angle	SX14Q009	SX14Q009-ZZA	Not required	–	JJ	TC	JC
6.2"	640 x 240	173 x 70 x 7	CCFL	110cd/m2	30:1	3.3V	50k hour CCFL, DC/DC, Wide Viewing Angle	SX16H006	SX16H006-ZZA	INVC658	BP	HP	–	–
7.5"	640 x 480 (VGA)	197 x 145 x 8	2 x CCFL	150cd/m2	25:1	3.3V	Negative Mode	SX19V010	SX19V010-ZZA	–	–	JM	–	JC

Data Cable
Data Connector
Backlight Connector
Touchscreen Connector

See pages 15-17 for part numbers

Need to know more

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Need technical support

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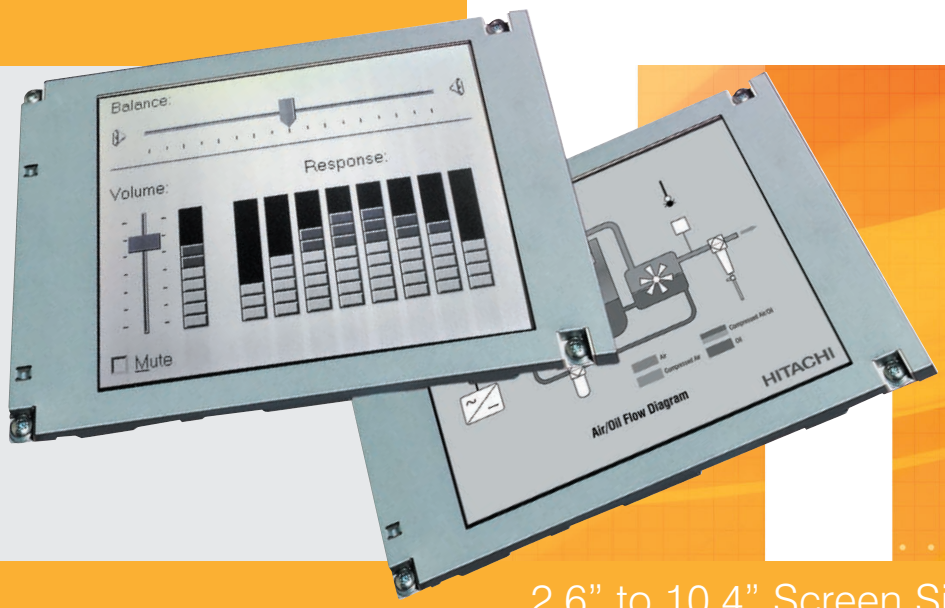
We're here to help.

Mono Graphic Displays - Passive



2.6” to 10.4” Screen Sizes

Features

- **Exceptional Optical Performance**
  High twist LC material and film compensated STN technology produce high contrast and excellent readability, Transflective versions for sunlight operation available.
- **Positive & Negative Mode**
  Standard parts feature both positive and negative mode versions.
- **Touchscreen Versions**
  4-wire analogue resistive touchscreens with anti-glare and non-scratch finish.
- **Backlight Variants**
  White, amber LED, standard life or long life CCFL and Electro-Luminescent (EL) backlights.
- **Types With Built-in Controllers**
  Two screen sizes have on-board controllers.
- **Compact Dimensions**
  Tape Carrier Package (TCP) and Chip on Glass (COG) construction both produce compact mechanical dimensions and lightweight modules.

Introduction

A large range of STN and Film-STN (FSTN) monochrome graphic modules from Hitachi offering resolutions up to VGA. High bright and analogue touchscreen options together with types suitable for sunlight readability and/or harsher temperatures ensure that these products provide solutions for a broad spectrum of applications and market environments.

Specification

Optical

Option of transflective or transmissive mode. Backgrounds are white unless otherwise stated.

Mechanical

Touchscreen adds 0.9 to 1.7mm to dimension ‘D’.

Environmental

The displays listed opposite are suitable for operating over a variety of temperature ranges. Identified by a code letter in a column adjacent to the features they include types designed for use over the wide -20 to +70°C industrial temperature range.

Applications

- Data Loggers
- EPOS
- Process Control
- Instrumentation
- Security Systems
- Information Terminals
- Ticketing Systems

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Controller/Driver ICs

Solomon Systech LCD graphic controllers and an IDT touchcscreen controller are available for Hitachi displays.
See page 18 for details.

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Mono Graphic Displays - Passive

- Excellent Optical Performance
- Positive & Negative Mode
- Touchscreen Versions
- Backlight Variants
- Types With Built-in Controllers
- Compact Dimensions

Fully supported by availability of essential accessories:

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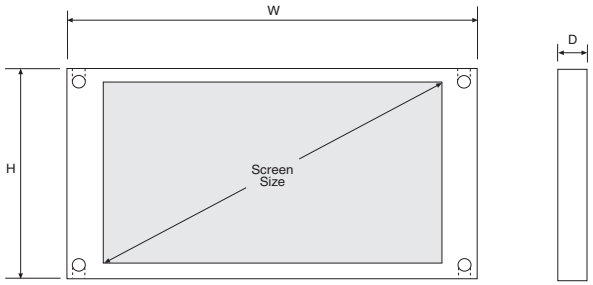
- Connectors

Plus Development Boards

Dimensions (mm)



Screen Size	Resolution	Display Type	Module Dimensions W x H x D (mm)	Backlight	Brightness Non Touch Version	Contrast	Supply Voltage (V)	Features	Oper. Temp. Range	Part Number	Touchcreen Version	Essential Accessories (see pages 14-17)				
												Inverter	Cable & Connector Codes			
Transflective																
2.6"	320 x 240 (QVGA)	FSTN	67.1 x 55.8 x 3.8	Amber LED	7cd/m2	5:1	3.3, 25	Sunlight Readable, Wide Temp Range	(A)	SP06Q002-T	SP06Q002-TZA	Not required	–	HM	–	–
3.8"	240 x 320 (QVGA)	FSTN	71.5 x 92.1 x 7.9	White LED	5cd/m2	12:1	3.3, 30	Portrait Mode	(C)	SP10Q005-T	SP10Q003-T	Not required	–	HM	–	–
3.8"	320 x 240 (QVGA)	FSTN	94.7 x 73.3 x 5.5	White LED	60cd/m2	5:1	3.3, 30	Sunlight Readable, Wide Temp Range	(A)	SP10Q010-T	SP10Q010-TZA	Not required	–	HM	–	JC
4.7"	320 x 240 (QVGA)	FSTN	129.6 x 92.6 x 7.5	CCFL	25cd/m2	5:1	5.0, -22	Sunlight Readable	(F)	LMG7525RPFF	–	INVC819/821	CG	JG	–	–
4.7"	320 x 240 (QVGA)	FSTN	129.6 x 92.6 x 7.5	White LED	60cd/m2	5:1	5.0, -22	Sunlight Readable, Wide Temp Range	(A)	ST12Q01L6ALZZ	–	Not required	CG	JG	–	–
5.7"	320 x 240 (QVGA)	FSTN	167.0 x 109.0 x 10	CCFL	60cd/m2	5:1	5.0, -22	Sunlight Readable	(C)	SP14Q002-T	–	INVC132/186/196	–	KH	–	–
5.7"	320 x 240 (QVGA)	FSTN	167.0 x 109.0 x 10	White LED	60cd/m2	5:1	5.0, -22	Sunlight Readable, Wide Temp Range	(A)	SP14Q006-T	SP14Q006-TZA	Not required	–	KH	TC	JC
Transmissive																
3.8"	320 x 240 (QVGA)	STN	94.7 x 73.3 x 5.5	White LED	110cd/m2	20:1	3.3, 30	Negative Mode, Wide Temp Range	(A)	SP10Q010	SP10Q010-ZZA	Not required	–	HM	–	–
4.7"	320 x 240 (QVGA)	STN	129.6 x 92.6 x 7.5	CCFL	100cd/m2	20:1	3.0/5.0, -22	Negative Mode	(F)	LMG7520RPFC	–	INVC819/821	CG	JG	–	–
4.7"	320 x 240 (QVGA)	FSTN	129.6 x 92.6 x 7.5	White LED	60cd/m2	20:1	3.0/5.0, -22	Wide Temp Range	(A)	SP12Q01L6ALZZ	–	Not required	CG	JG	–	–
4.8"	256 x 64	STN	160.0 x 68.0 x 9.5	EL	10cd/m2	3:1	5.0, -13	Grey Negative Mode, LC7981 Controller	(F)	SP12N001-T	–	*	–	RM	–	–
4.8"	256 x 64	FSTN	160.0 x 68.0 x 12	CCFL	90cd/m2	20:1	5.0, -15	Reversible Mode, T6963C Controller	(C)	SP12N002	–	INVC816	–	–	–	–
5.1"	240 x 128	FSTN	159.4 x 101.0 x 11	CCFL	150cd/m2	20:1	5.0	50k Hour CCFL, DC/DC, T6963C Controller	(B)	SP14N001	SP14N001-ZZA	INVC816	CQ	JQ	–	–
5.1"	240 x 128	FSTN	159.4 x 101.0 x 11	White LED	150cd/m2	20:1	5.0	DC/DC, T6963C Controller	(B)	SP14N01L6VLCZ	SP14N01L6VLCA	Not required	CQ	JQ	–	–
5.1"	240 x 128	FSTN	159.4 x 101.0 x 11	CCFL	150cd/m2	20:1	5.0, -15	50k Hour CCFL, T6963C Controller	(B)	SP14N001-Z1	SP14N001-Z1A	INVC816	CQ	JQ	–	–
5.1"	240 x 128	FSTN	159.4 x 101.0 x 11	White LED	150cd/m2	20:1	5.0, -15	T6963C Controller	(B)	SP14N01L6ALCZ	SP14N01L6ALCA	Not required	CQ	JQ	–	–
5.1"	240 x 128	STN	159.4 x 101.0 x 11	CCFL	150cd/m2	20:1	5.0, -15	Negative Mode, LC7981 Controller	(C)	SP14N002	–	INVC816	–	RM	–	–
5.1"	240 x 128	STN	159.4 x 101.0 x 11	CCFL	90cd/m2	7:1	5.0, -15	Blue Negative Mode, LC7981 Controller	(C)	SP14N003	–	INVC816	–	RM	–	–
5.7"	320 x 240 (QVGA)	STN	167.0 x 109.0 x 10	CCFL	110cd/m2	25:1	3.3, -22	Negative Mode	(C)	SP14Q002-A1	–	INVC132/186/196	–	KH	–	–
5.7"	320 x 240 (QVGA)	FSTN	167.0 x 109.0 x 10	CCFL	110cd/m2	25:1	3.3, -22	50k Hour CCFL, Wide Temp Range	(A)	SP14Q002-C1	SP14Q002-C1A	INVC132/186/196	–	KH	–	JC
5.7"	320 x 240 (QVGA)	FSTN	167.0 x 109.0 x 10	CCFL	110cd/m2	25:1	3.3, -22	–	(D)	–	SP14Q002-C2A	INVC132/186/196	–	KH	–	JC
5.7"	320 x 240 (QVGA)	STN	167.0 x 109.0 x 10	White LED	200cd/m2	6:1	3.3, -22	Blue Negative Mode, Wide Temp Range	(A)	SP14Q003-A	SP14Q003-AZA	Not required	–	KH	TC	–
5.7"	320 x 240 (QVGA)	STN	167.0 x 109.0 x 10	CCFL	100cd/m2	6:1	3.3, -22	Blue Negative Mode, 50k Hour CCFL, Wide Temp Range	(A)	SP14Q003-C1	SP14Q003-C1A	INVC132/186/196	–	KH	–	JC
5.7"	320 x 240 (QVGA)	FSTN	167.0 x 109.0 x 10	CCFL	220cd/m2	25:1	3.3, -22	50k Hour CCFL, High Bright, Wide Temp Range	(A)	SP14Q005	SP14Q005-ZZA	INVC132/186/196	–	KH	–	JC
5.7"	320 x 240 (QVGA)	FSTN	167.0 x 109.0 x 10	White LED	150cd/m2	25:1	3.3, -22	High Bright, Wide Temp Range	(A)	SP14Q006	SP14Q006-ZZA	Not required	–	KH	TC	JC
5.7"	320 x 240 (QVGA)	FSTN	131.0 x 102.0 x 10.9	White LED	220cd/m2	25:1	5.0, 32.5	Wide Temp Range	(A)	SP14Q011-A	SP14Q011-AZA	Not required	BM	HM	–	–
9.4"	640 x 480 (VGA)	STN	257.5 x 174.0 x 7	CCFL	110cd/m2	20:1	3.0/5.0, -22	Negative Mode, 50k Hour CFL	(E)	SP24V001	SP24V001-ZZA	INVC817/823	–	SX	–	JC
9.4"	640 x 480 (VGA)	STN	257.5 x 174.0 x 7	CCFL	110cd/m2	20:1	3.0/5.0, -22	Negative Mode, 50k Hour CFL	(E)	SP24V001-A	–	INVC817/823	–	SX	–	–
10.4"	640 x 480 (VGA)	STN	264.0 x 183.0 x 9	CCFL	100cd/m2	18:1	5.0, -22	Negative Mode	(E)	LMG7550XUFC	–	INVC818/819/821	–	SX	–	–

Oper. temp. range (A) = -20 to +70°C, (B) = -10 to +60°C, (C) = 0 to +60°C, (D) = 0 to +50°C, (E) = 0 to +45°C, (F)= 0 to +40°C

* Not currently available

Data Cable
Data Connector
Backlight Connector
Touchscreen Connector

See pages 15-17 for part numbers

BONA Mono Graphic Displays - see pages 8-9

Need to know more

A "Glossary of Terms" is provided on page 20 together with details of "Viewing Characteristics".

Need technical support

See page 19 for details.
We're here to help.

Mono Graphic Displays - Passive

120 x 32 to 320 x 240 (QVGA) Screen Resolutions

Features

- **Choice of Passive Matrix**

  Displays are offered in STN or FSTN.

- **Positive & Negative Mode**

  The Yellow/Green STN, Grey STN and Black/White FSTN displays listed are positive mode. The Blue STN displays are negative mode. Variations may be available upon request.

- **Viewing Direction Options**

  The normal viewing direction is 6 o'clock. Other viewing directions are available upon request.

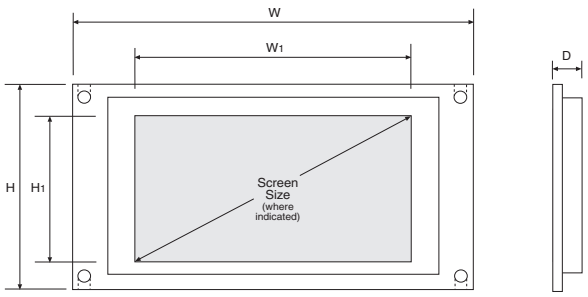
- **Backlight Variants**

  Choice of LED, EL or CCFL backlights. LED colours are either white or yellow/green with the option of amber, blue, green or red.

- **Built-in Controller**

  An on-board controller is fitted to all models.

Dimensions (mm)



Introduction

A wide range of STN and FSTN monochrome graphic modules from Bona Fide, which offer a choice of styles, backlighting colours and LCD colours in reflective, transflective or transmissive modes. The tables detail the most popular combinations available, with the second table listing 4:3 formats in both QVGA and portrait. However, variations in their specification can be easily accommodated - please contact us to discuss your alternative requirements.

Specification

Optical

Yellow/Green STN and Black/White FSTN backlit displays are transflective mode.
Blue Negative STN backlit displays are transmissive mode.
Non-backlit displays are reflective mode.

Environmental

Standard operating temperature range is 0 to +50°C.
Displays capable of handling a wider temperature range of -20 to +70°C or an extended range of -30 to +80°C can be supplied to special order.

Applications

■ Data Loggers ■ EPOS ■ Process Control ■ Instrumentation ■ Security Systems
■ Information Terminals ■ Ticketing Systems

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BONA

Mono Graphic Displays - Passive

- Choice of Passive Matrix
- Positive & Negative Display Mode
- Viewing Direction Options
- Backlight Variants
- Built-in Controller

Fully supported by availability of essential accessories:

- Cables
- Connectors

Plus Development Boards

Resolution	Viewing Area W1 x H1 (mm)	Module Dimensions W x H x D (mm)	Supply Voltage	On-Board Controller	Features	Part Number			Essential Accessories (see pages 15-17)		
						Yellow/Green STN +Yell/Grn LED Backlight	Blue Negative STN + White LED Backlight	Grey STN Reflective	Cable & Connector Codes		
120 x 32	62.0 x 22.5	68.1 x 32.9 x 7.6	3.3/5.0V	PT6250	EL B/L Option	BY-MG12032DLYS-01	BB-MG12032DLWS-01	BG-MG12032DNS-01	–	SL	–
122 x 32	61.7 x 17.4	84.0 x 44.0 x 15.0	3.3/5.0V	PT6520	EL B/L Option	BY-MG12232DLYS-01	BB-MG12232DLWS-01	BG-MG12232DNS-01	–	RM	–
122 x 32	60.6 x 20.0	65.4 x 30.0 x 5.0	3.3/5.0V	PT6520	–	BY-MG12232DLYS-02	BB-MG12232DLWS-02	BG-MG12232DNS-02	–	JL	–
122 x 32	54.8 x 19.1	65.6 x 29.2 x 5.2	3.3V	PT6520	–	BY-MG12232DLYS-12	BB-MG12232DLWS-12	BG-MG12232DNS-12	–	JL	–
128 x 64	70.9 x 39.1	93.0 x 70.0 x 14.0	5.0V	KS0107B	EL B/L Option	BY-MG12864DLYS-01	BB-MG12864DLWS-01	BG-MG12864DNS-01	–	SM	–
128 x 64	44.5 x 29.5	54.0 x 54.5 x 10.0	5.0V	KS0107B	EL B/L Option	BY-MG12864DLYS-02	BB-MG12864DLWS-02	BG-MG12864DNS-02	–	SM	–
128 x 64	54.0 x 31.0	59.0 x 39.5 x 2.2	3.0V	KS0713	DC/DC, No B/L	–	–	BG-MG12864DNS-03	–	–	–
128 x 64	31.0 x 16.5	36.7 x 29.2 x 4.55	3.0V	SSD1815Z	DC/DC	BY-MG12864DLYS-04	BB-MG12864DLWS-04	BG-MG12864DNS-04	–	–	–
128 x 64	50.0 x 29.0	55.0 x 43.0 x 2.6	3.0V	S6B1713	DC/DC, EL B/L Only	BY-MG12864DES-05	–	–	–	JS	–
128 x 64	70.7 x 38.8	93.7 x 52.4 x 5.5	3.0V	SPLC501C	DC/DC	BY-MG12864DLYS-06	BB-MG12864DLWS-06	BG-MG12864DNS-06	–	HQ	–
128 x 64	70.7 x 38.8	93.2 x 70.0 x 8.2	3.0V	SPLC501C	DC/DC	BY-MG12864DLYS-07	BB-MG12864DLWS-07	–	–	HQ	–
128 x 64	51.0 x 28.0	65.0 x 46.6 x 5.3	3.0V	S6B1713	DC/DC	BY-MG12864DLYS-18	BB-MG12864DLWS-18	–	–	HR	–
128 x 64	59.0 x 32.0	75.0 x 55.0 x 9.2	5.0V	KS0107B	–	BY-MG12864DLYS-19	BB-MG12864DLWS-19	–	–	RM	–
128 x 128	62.0 x 62.0	85.0 x 100.0 x 14.5	5.0V	KS0107B	–	BY-MG128128DLYS-01	BB-MG128128DLWS-01	BG-MG128128DNS-01	–	SN	–
240 x 64	132.6 x 39.0	180.0 x 75.0 x 14.0	5.0V	KS0107B	EL B/L Option	BY-MG24064DLYS-01	BB-MG24064DLWS-01	BG-MG24064DNS-01	–	SN	–
240 x 64	132.6 x 39.0	180.0 x 65.0 x 14.0	5.0V	T6963C	EL B/L Option	BY-MG24064DLYS-02	BB-MG24064DLWS-02	BG-MG24064DNS-02	–	SN	–
240 x 64	114.0 x 35.0	149.0 x 57.0 x 13.0	5.0V	KS0108B	EL B/L Option	BY-MG24064DLYS-04	–	–	–	SN	–
240 x 64	102.0 x 35.5	120.0 x 55.0 x 13.7	5.0V	S1D13700	–	BY-MG24064DLYS-05	BB-MG24064DLWS-05	–	–	QL	–
240 x 128	114.8 x 64.6	144.0 x 104.0 x 14.6	5.0V	T6963C	EL B/L Option	BY-MG240128DLYS-01	BB-MG240128DLWS-01	BG-MG240128DNS-01	–	RN	–
256 x 64	149.6 x 43.0	184.0 x 75.0 x 10.2	5.0V	HD61830	No B/L	BY-MG25664DNS-01	–	–	–	RM	–

4:3 format versions (QVGA and portrait)

Resolution	Screen Size	Display Type	Module Dimensions W x H x D (mm)	Backlight	Supply Voltage	On-Board Controller	Part Number	Essential Accessories (see pages 15-17)		
								Cable & Connector Codes		
240 x 320	3.5"	Yell/Grn STN	70.5 x 89.0 x 5.3	EL	3.3/5.0V	NT7701H	BY-MG320240DES-01	–	HP	–
240 x 320	3.5"	Blue Neg STN	70.5 x 89.0 x 5.3	EL	3.3/5.0V	NT7701H	BB-MG320240DES-01	–	HP	–
240 x 320	3.5"	B/W FSTN	70.5 x 89.0 x 5.3	EL	3.3/5.0V	NT7701H	BF-MG320240DES-01	–	HP	–
320 x 240 (QVGA)	5.2"	Yell/Grn STN	160.0 x 109.0 x 12.0	White LED	5.0V	S1D13700	BY-MG320240DLWS-02	DM	KM	–
320 x 240 (QVGA)	5.2"	Blue Neg STN	160.0 x 109.0 x 12.0	White LED	5.0V	S1D13700	BB-MG320240DLWS-02	DM	KM	–
320 x 240 (QVGA)	5.2"	B/W FSTN	160.0 x 109.0 x 12.0	White LED	5.0V	S1D13700	BF-MG320240DLWS-02	DM	KM	–
320 x 240 (QVGA)	5.2"	Yell/Grn STN	160.0 x 109.0 x 12.0	CCFL	5.0V	HD66206	BY-MG320240DCS-21	DJ	KJ	–
320 x 240 (QVGA)	5.2"	Blue Neg STN	160.0 x 109.0 x 12.0	CCFL	5.0V	HD66206	BB-MG320240DCS-21	DJ	KJ	–
320 x 240 (QVGA)	5.2"	B/W FSTN	160.0 x 109.0 x 12.0	CCFL	5.0V	HD66206	BF-MG320240DCS-21	DJ	KJ	–

Data Cable
Data Connector
Backlight Connector

See pages 15-17 for part numbers

HITACHI
Inspire the Next

Mono Graphic Displays - see pages 6-7

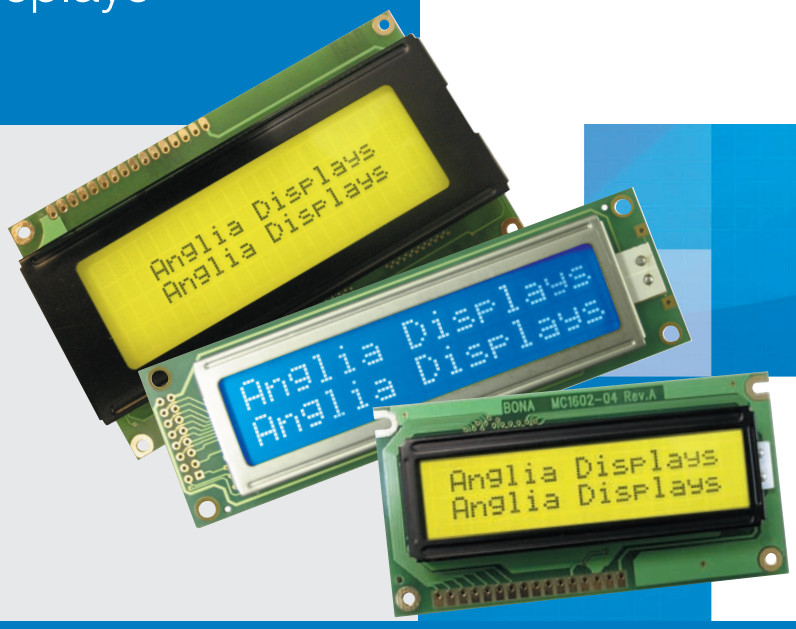
Need to know more

A "Glossary of Terms" is provided on page 20 together with details of "Viewing Characteristics".

Need technical support

See page 19 for details.
We're here to help.

Alphanumeric Displays



16 x 1 to 40 x 4 Screen Formats

Features

- **Choice of Passive Matrix**

  Displays are offered in STN but FSTN can also be supplied.

- **Positive & Negative Mode**

  The Yellow/Green STN and Grey STN displays listed are positive mode. The Blue STN displays listed are negative mode. Variations may be available upon request.

- **Viewing Direction Options**

  The normal viewing direction is 6 o'clock. Other viewing directions are available upon request.

- **Backlight Variants**

  Choice of LED or EL backlights for use with transflective or transmissive modules. LED colours are either white or yellow/green with the option of amber, blue, green or red.

- **Built-in Controller**

  An on-board controller is fitted to all models.

Introduction

A wide range of STN alphanumeric display modules from Bona Fide, which offer a choice of formats, backlighting colours and LCD colours in reflective, transflective or transmissive modes. The table details the most popular combinations available but variations in their specification can be easily accommodated - please contact us to discuss your alternative requirements.

Specification

Optical

Yellow/Green backlit displays shown are transflective mode.
Blue Negative backlit displays shown are transmissive mode.
Non-backlit displays are reflective mode.

Environmental

Standard operating temperature range is 0 to +50°C.
Displays capable of handling a wider temperature range of -20 to +70°C or an extended range of -30 to +80°C can be supplied to special order.

Applications

- Process Control
- Instrumentation
- Security Systems
- Ticketing Systems

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BONA

Alphanumeric Displays

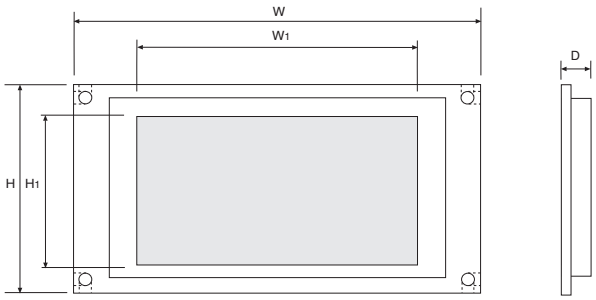
- Choice of Passive Matrix
- Positive & Negative Mode
- Viewing Direction Options
- Backlight Variants
- Built-in Controller

Fully supported by availability of essential accessories:

- Connectors

Plus Development Boards

Dimensions (mm)



Screen Format Char. x Lines	Viewing Area W1 x H1 (mm)	Module Dimensions W x H x D (mm)	Supply Voltage	On-board Controller	Features	Part Number			Essential Accessories (see pages 15-17)		
						Yellow/Green STN + Yell/Grn LED Backlight	Blue Negative STN + White LED Backlight	Grey STN Reflective	Cable & Connector Codes		
16 x 1	64.5 x 13.8	79.5 x 35.5 x 13.0	5.0V	KS0066U	EL B/L Option	BY-MC1601DLYS-01	BB-MC1601DLWS-01	BG-MC1601DNS-01	–	RJ	–
16 x 1	64.5 x 13.8	79.5 x 35.5 x 13.0	5.0V	KS0066U	EL B/L Option	BY-MC1601DLYS-02	BB-MC1601DLWS-02	BG-MC1601DNS-02	–	RJ	–
16 x 2	99.0 x 24.0	122.0 x 44.0 x 14.0	5.0V	KS0066U	EL B/L Option	BY-MC1602DLYS-03	BB-MC1602DLWS-03	BG-MC1602DNS-03	–	RJ	–
16 x 2	65.6 x 16.0	84.0 x 44.0 x 13.0	5.0V	KS0066U	EL B/L Option	BY-MC1602DLYS-04	BB-MC1602DLWS-04	BG-MC1602DNS-04	–	RJ	–
16 x 2	65.6 x 16.0	79.5 x 35.5 x 13.0	5.0V	KS0066U	EL B/L Option	BY-MC1602DLYS-13	BB-MC1602DLWS-13	BG-MC1602DNS-13	–	RJ	–
16 x 2	65.6 x 16.0	79.5 x 35.5 x 13.0	5.0V	KS0066U	EL B/L Option	BY-MC1602DLYS-17	BB-MC1602DLWS-17	BG-MC1602DNS-17	–	RJ	–
16 x 2	64.4 x 13.8	79.5 x 35.5 x 13.0	5.0V	KS0066U	EL B/L Option	BY-MC1602DLYS-18	BB-MC1602DLWS-18	BG-MC1602DNS-18	–	RJ	–
16 x 2	61.0 x 15.7	65.0 x 27.7 x 2.85	5.0V	ML9042	EL B/L Option	–	–	BG-MC1602DNS-20	–	–	–
16 x 2	61.0 x 16.0	85.0 x 32.5 x 13.0	5.0V	KS0066U	EL B/L Option	BY-MC1602DLYS-21	BB-MC1602DLWS-21	BG-MC1602DNS-21	–	SJ	–
16 x 4	61.8 x 25.2	87.0 x 60.0 x 14.0	5.0V	KS0066U	EL B/L Option	BY-MC1604DLYS-01	BB-MC1604DLWS-01	BG-MC1604DNS-01	–	RJ	–
16 x 4	61.8 x 25.2	87.0 x 60.0 x 15.0	5.0V	SPLC780	–	BY-MC1604DLYS-02	BB-MC1604DLWS-02	BG-MC1604DNS-02	–	RJ	–
20 x 2	85.0 x 19.8	116.0 x 37.0 x 10.0	5.0V	KS0066U	EL B/L Option	BY-MC2002DLYS-01	BB-MC2002DLWS-01	BG-MC2002DNS-01	–	SJ	–
20 x 2	85.0 x 19.8	116.0 x 39.0 x 14.0	5.0V	KS0066U	EL B/L Option	BY-MC2002DLYS-02	BB-MC2002DLWS-02	BG-MC2002DNS-02	–	RJ	–
20 x 2	85.0 x 19.8	116.0 x 37.0 x 14.0	5.0V	KS0066U	EL B/L Option	BY-MC2002DLYS-03	BB-MC2002DLWS-03	BG-MC2002DNS-03	–	SJ	–
20 x 4	76.0 x 25.2	98.0 x 60.0 x 14.0	5.0V	KS0066U	EL B/L Option	BY-MC2004DLYS-01	BB-MC2004DLWS-01	BG-MC2004DNS-01	–	RJ	–
20 x 4	76.0 x 25.2	98.0 x 60.0 x 15.0	5.0V	S6A0069	–	BY-MC2004DLYS-04	BB-MC2004DLWS-04	BG-MC2004DNS-04	–	RJ	–
24 x 2	93.5 x 15.8	118.0 x 36.0 x 14.0	5.0V	KS0066U	EL B/L Option	BY-MC2402DLYS-01	BB-MC2402DLWS-01	BG-MC2402DNS-01	–	SJ	–
40 x 2	154.0 x 15.8	182.0 x 33.5 x 14.0	5.0V	KS0066U	EL B/L Option	BY-MC4002DLYS-01	BB-MC4002DLWS-01	BG-MC4002DNS-01	–	SJ	–
40 x 4	147.0 x 29.5	190.0 x 54.0 x 14.0	5.0V	KS0066U	EL B/L Option	BY-MC4004DLYS-01	BB-MC4004DLWS-01	BG-MC4004DNS-01	–	SL	–

Data Cable
Data Connector
Backlight Connector

See pages 15-17 for part numbers

Need to know more

A “Glossary of Terms” is provided on page 20 together with details of “Viewing Characteristics”.

Need technical support

See page 19 for details.
We’re here to help.

Custom Displays

Monochrome LCD

Custom Options

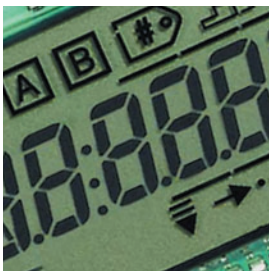
These include :

- Custom screen icons on LCD glass
- Custom icons added to standard displays
- Wide temperature specifications
- Touch panels
- EL backlights
- LED backlights in white or colour
- LCD colour
- Negative mode
- Viewing angle
- Reflective, transflective and transmissive
- Driver IC selection
- Connector variations

Introduction

For customers who require a monochrome LCD display that is not featured in this brochure Anglia Displays are able to offer a wide variety of custom made products from Bona Fide in TN, HTN, STN, FSTN, CSTN and TFT. They range from 7-Segment displays with custom icons through to 320 x 240 dot graphic displays with a touch panel.

Depending on the level of customisation and value of the finished product minimum order quantities will vary from low to medium volume.



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BONA

- Monochrome LCD
- Wide variety of display technologies to choose from
- Extensive list of customisation options
- Choice of chip mounting technology

The Custom Process

The process consists of the following steps:

1) Customer submits a drawing of the desired display icons and layout.
2) Bona Fide produces a drawing to base production upon.
3) Customer accepts or amends the manufacturing drawing.
4) Samples are produced for customer test and approval.
5) Customer approves the samples or requests final changes.
6) Once the customer is satisfied with samples the first production batch can be made.

Custom parts are 100% tested.

Estimated total time for the custom process 12-16 weeks.

Chip Mounting Technology

Chip on glass (COG)
Chip on board (COB)
Chip on tab (TAB)

Need to know more

A “Glossary of Terms” is provided on page 20 together with details of “Viewing Characteristics”.

Need technical support

See page 19 for details.
We’re here to help.

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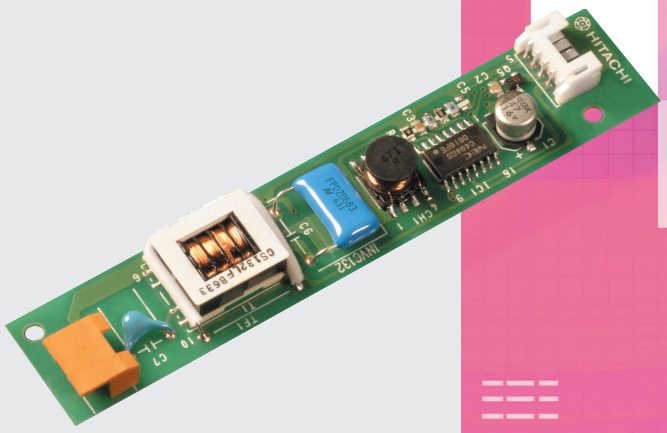

To Power CCFL Backlights

Features

- Low Voltage Input, 5V & 12V
- Single, Dual & Quad Output
- Dimming Facility Available
- Remote On/Off Function

Introduction

A range of inverters specifically designed to drive the CCFL backlights of Hitachi displays listed in this brochure.

Part Number	Description	Input Voltage	Input Voltage Range	Input Current (mA)	Dimensions (mm) L x W x H	Features	Input Connector
INVC132	Inverter for SP14Q002, SP14Q003 & SP14Q005	12V	8 - 17V	200 (Vin = 12V)	103.0 x 20.0 x 10.0	Dim Function	XD
INVC186	Inverter for SP14Q002, SP14Q003 & SP14Q005	12V	10.8 - 13.2V	170	90.0 x 20.0 x 8.4	–	XB
INVC196	Inverter for SP14Q002, SP14Q003 & SP14Q005	5V	4.5 - 5.5V	360	90.0 x 20.0 x 8.4	–	XB
INVC617	Inverter for TX14D11, TX18D16 & TX20D16	12V	10.8 - 13.2V	500	100.0 x 30.0 x 11.5	Dim Function	WD
INVC655	Inverter for TX26D01 & TX26D55 (2 Outputs)	12V	9.6 - 14.4V	580	140.0 x 22.0 x 8.0	Dim Function	WD
INVC657	Inverter for TX14D11, TX18D16 & TX20D16	12V	10.8 - 13.2V	320	120.0 x 12.0 x 6.0	Dim Function	XZ
INVC658	Inverter for SX16H006	12V	9.0 - 13.2V	205	80.0 x 16.0 x 6.2	Dim Function	WE
INVC659	Inverter for TX16D11	12V	9.0 - 13.2V	220	80.0 x 16.0 x 6.3	Dim Function	WE
INVC667	Inverter for SX14Q001 & SX14Q004	5V	4.5 - 5.5V	480	90.5 x 22.0 x 10.0	–	XB
INVC695	Inverter for TX14D12	5V	4.75 - 5.25V	670	80.0 x 16.0 x 6.2	Dim Function	WE
INVC783	Inverter for TX31D55 & TX31D56 (2 Outputs)	12V	10.8 - 13.2V	960	130.0 x 35.0 x 10.0	Dim Function	WE
INVC784	Inverter for TX38D55 & TX39D55 (4 Outputs)	12V	10.8 - 13.2V	1300	180.0 x 35.0 x 10.0	Dim Function	WF
INVC816	Inverter for SP12N002, SP14N001, SP14N002 & SP14N003	12V	7 - 17V	180	95.0 x 15.0 x 6.0	Dim Function	WD
INVC817	Inverter for SP24V001	12V	8 - 17V	210	130.0 x 18.0 x 6.0	Dim Function	ZD
INVC818	Inverter for LMG7550	12V	7 - 19V	350	110.0 x 13.0 x 8.0	Dim Function	YE
INVC819	Inverter for SP10Q002, LMG7520, LMG7525 & LMG7550	12V	10.8 - 13.2V	200	90.0 x 22.0 x 10.0	–	XB
INVC821	Inverter for SP10Q002, LMG7520, LMG7525 & LMG7550	5V	4.5 - 5.5V	510	90.0 x 22.0 x 10.0	–	XB
INVC823	Inverter for SP24V001	12V	8-17V	260	130.0 x 18.0 x 8.0	–	ZD

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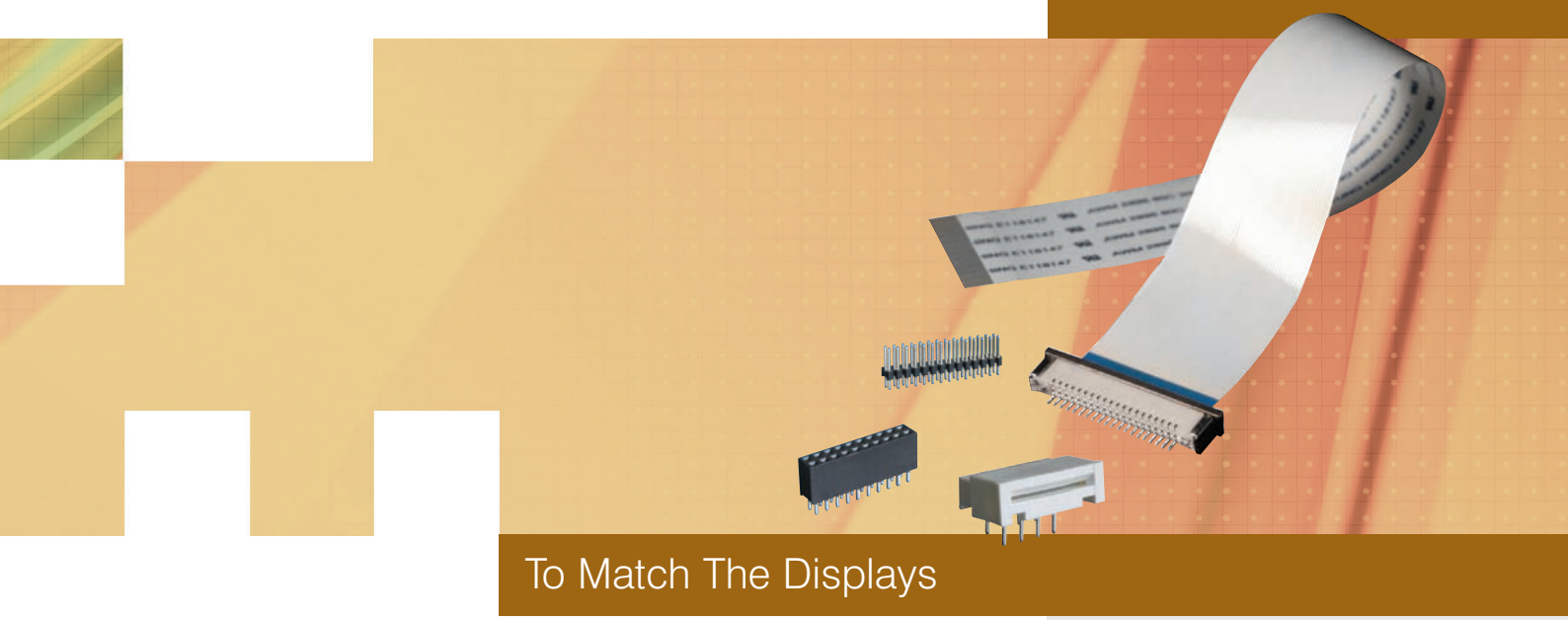
Cable & Connectors



To Match The Displays

Introduction

The cable and connector requirements for displays featured in this brochure are many and varied. To simplify the situation we have given each display, listed on the previous pages, a reference code or group of reference codes under the heading 'Essential Accessories'. These codes are repeated on the following pages and will identify which cables and connectors are required to match the chosen display together with their part numbers for ordering.

Data cable and connectors

Most Hitachi displays use Flat Flexible Cable for the data input connections. Whilst some of the displays will have the cable already fitted and require only an FFC connector for your driver PCB, the majority will have an FFC connector only which requires a cable plus an FFC connector for your driver PCB.

Most Bona Fide displays have only holes in the PCB and will require pin headers and a mating socket for your driver PCB.

Backlight connectors

Displays with backlights may require a pin header on your driver PCB to accept the flying lead socket on the display. CCFL backlight units on Hitachi displays have a flying lead connector which mates with their inverter PCB, whereas Bona CCFL units are terminated through the data connector.

Inverter connectors

Hitachi CCFL inverter units have a pin header as the DC input connector and require a specific crimp socket to mate.

Touchscreen connectors

Hitachi touchscreen units have a 4 way FFC tail fitted and require a 4 way FFC connector on your touchscreen controller PCB.

Features

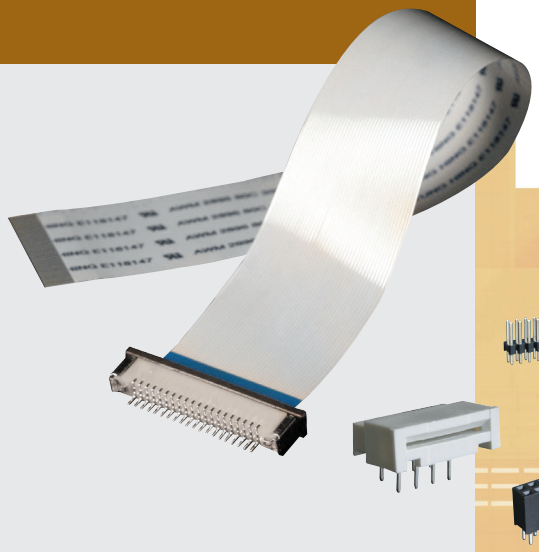
- **Data Cable & Connectors**
  Flat Flexible Cable and FFC connectors for Hitachi displays, pin headers and sockets for Bona Fide.
- **Backlight Connectors**
  Pin headers to accept flying lead socket from the displays.
- **Inverter Connectors**
  Crimp sockets for DC input on Hitachi CCFL inverters.
- **Touchscreen Connectors**
  4 way FFC connectors for your touchscreen controller PCB.

continued overleaf > > > >

Need to know more
A "Glossary of Terms" is provided on page 20 together with details of "Viewing Characteristics".

Need technical support
See page 19 for details.
We're here to help.

Cable & Connectors



continuation from page 15

Flat Flexible Cable (for Hitachi displays)

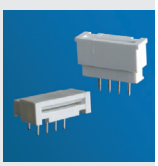
Ref Code	FFC Description	Part Number TAICOM 50mm	100mm	150mm	200mm	250mm
BM	0.5mm 20W	TFF20C3L050	TFF20C3L100	TFF20C3L150	TFF20C3L200	TFF20C3L250
BP	0.5mm 24W	TFF24C3L050	TFF24C3L100	TFF24C3L150	TFF24C3L200	TFF24C3L250
BT	0.5mm 32W	TFF32C3L050	TFF32C3L100	TFF32C3L150	TFF32C3L200	TFF32C3L250
BV	0.5mm 40W	TFF40C3L050	TFF40C3L100	TFF40C3L150	TFF40C3L200	TFF40C3L250
BW	0.5mm 50W	TFF50C3L050	TFF50C3L100	TFF50C3L150	TFF50C3L200	TFF50C3L250
CG	1mm 12W	TFF12C2L050	TFF12C2L100	TFF12C2L150	TFF12C2L200	TFF12C2L250
CQ	1mm 26W	TFF26C2L050	TFF26C2L100	TFF26C2L150	TFF26C2L200	TFF26C2L250
DJ	1.25mm 16W	TFF16C1L050	TFF16C1L100	TFF16C1L150	TFF16C1L200	TFF16C1L250
DM	1.25mm 20W	TFF20C1L050	TFF20C1L100	TFF20C1L150	TFF20C1L200	TFF20C1L250

Flat Flexible Cable Connectors (for your driver PCB)

SMT

Ref Code	FFC Description	Part Number Top Contact (HIROSE)	Vertical (HIROSE)	Top Contact (JAE)	Bottom Contact (JAE)	Top Contact (Tyco Electronics)	Bottom Contact (Tyco Electronics)
GU	0.3mm 39W	FH2639S0.3SHW(05)	–	–	–	–	–
GX	0.3mm 45W	FH2345S0.3SHW(05)	–	–	–	–	–
HM	0.5mm 20W	FH12A20S0.5SH(55)	FH12-20S0.5SV(55)	ILFPRU20SHFN1R3000	ILFPR20SHFN1R3000	2-1734839-0	2-1734592-0
HP	0.5mm 24W	FH12A24S0.5SH(55)	FH12-24S0.5SV(55)	ILFPRU24SHFN1R3000	ILFPR24SHFN1R3000	2-1734839-4	2-1734592-4
HQ	0.5mm 26W	FH12A26S0.5SH(55)	FH12-26S0.5SV(55)	ILFPRU26SHFN1R3000	ILFPR26SHFN1R3000	2-1734839-6	2-1734592-6
HR	0.5mm 29W	FH12A29S0.5SH(55)	–	–	–	2-1734839-9	2-1734592-9
HT	0.5mm 32W	FH12A32S0.5SH(55)	FH12-32S0.5SV(55)	ILFPRU32SHFN1R3000	ILFPR32SHFN1R3000	3-1734839-2	3-1734592-2
HV	0.5mm 40W	FH12A40S0.5SH(55)	FH12-40S0.5SV(55)	ILFPRU40SHFN1R3000	ILFPR40SHFN1R3000	4-1734839-0	4-1734592-0
HW	0.5mm 50W	FH12A50S0.5SH(55)	FH12-50S0.5SV(55)	ILFPRU50SHFN1R3000	ILFPR50SHFN1R3000	5-1734839-0	5-1734592-0
		HIROSE	HIROSE	TAICOM	TAICOM	Tyco Electronics	Tyco Electronics
JC	1mm 4W	–	–	TFPC042RL2SM	TFPC042RL1SM	84953-4	84952-4
JG	1mm 12W	–	–	TFPC122RL2SM	TFPC122RL1SM	1-84953-2	1-84952-2
JJ	1mm 16W	FH12A-16S-1SH(55)	FH12-16S-1SV(55)	TFPC162RL2SM	TFPC162RL1SM	1-84953-6	1-84952-6
JL	1mm 18W	–	–	TFPC182RL2SM	TFPC182RL1SM	1-84953-8	1-84952-8
JM	1mm 20W	–	FH12-20S-1SV(55)	TFPC202RL2SM	TFPC202RL1SM	2-84953-0	2-84952-0
JQ	1mm 26W	–	–	TFPC262RL2SM	TFPC262RL1SM	2-84953-6	2-84952-6
JS	1mm 30W	–	–	TFPC302RL2SM	TFPC302RL1SM	3-84953-0	3-84952-0

Through Hole



Ref Code	FCC Description	Part Number Top Contact (Tyco Electronics)	Vertical (Tyco Electronics)
KH	1.25mm 14W	1-84533-4	1-84534-4
KJ	1.25mm 16W	1-84533-6	1-84534-6
KM	1.25mm 20W	2-84533-0	2-84534-0

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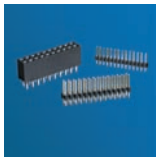
Cable & Connectors

- Data Cable & Connectors
- Backlight Connectors
- Inverter Connectors
- Touchscreen Connectors



Pin Headers & Sockets

(for display PCB data connections)

Ref Code	Description	Part Number	
		Header Straight	Mating PCB socket
		TAICOM	TAICOM
QL	2.0mm Single Row 18W	TPH18BSS	TFH18BSS
RJ	2.54mm Single Row 16W	TPH16SS	TFH16SS
RM	2.54mm Single Row 20W	TPH20SS	TFH20SS
RN	2.54mm Single Row 22W	TPH22SS	TFH22SS
SJ	2.54mm Dual Row 8 + 8W	TPH08DS	TFH08DS
SL	2.54mm Dual Row 9 + 9W	TPH09DS	TFH09DS
SM	2.54mm Dual Row 10 + 10W	TPH10DS	TFH10DS
SN	2.54mm Dual Row 11 +11W	TPH11DS	TFH11DS

Ref Code	Description	Part Number
		Crimp Socket
		TAICOM
SX	1.25mm Single Row 15W	TKH15FL + (terminal TK0011 x 15)

Pin Headers

(for your LED & EL backlight driver PCB, mates with display flying lead)

Ref Code	Description	Part Number	
		Header Straight	Header Right Angle
		JAE	JAE
TC	2.5mm Single Row 4W	ILG04PS3T2SA1	ILG04PS3L2SA1

Sockets

(for CCFL Inverter input, ouput connector mates with display flying lead)

Ref Code	Description	Part Number
		Crimp Socket
		TAICOM
WD	1.25mm Single Row 5W	TKH05FL + (terminal TK0011 x 5)
WE	1.25mm Single Row 6W	TKH06FL + (terminal TK0011 x 6)
WF	1.25mm Single Row 8W	TKH08FL + (terminal TK0011 x 8)
		TAICOM
XZ	1.0mm Single Row 7W	TKG07FL + (terminal TK1821 x 7)
XB	2.0mm Single Row 3W	TKM03FL + (terminal TK1921 x 3)
XD	2.0mm Single Row 5W	TKM05FL + (terminal TK1921 x 5)
		HIROSE
YE	1.25mm Single Row 6W	DF13-6S-1.25C + (term DF13-2630SCF x 6)
		JAE
ZD	1.25mm Single Row 5W	IL-Z-5S-S125C3 + (term IL-Z-C3-A-15000 x 5)

Need to know more

A “Glossary of Terms” is provided on page 20 together with details of “Viewing Characteristics”.

Need technical support

See page 19 for details.
We’re here to help.

Controller/ Driver ICs

- Display Driver ICs
- Development Kit
- Touchscreen Controller IC

With Development Kit

Features

- **Display Driver ICs**
  Provide a single chip LCD graphic controller solution.
- **Development Kit**
  To evaluate the Solomon Systech display driver ICs.
- **Touchscreen Controller IC**
  For 4-wire analogue resistive touchscreens.

Introduction

A range of Display drivers from Solomon Systech complemented by a development board to speed up the design process. A four wire resistive Touch Screen controller from IDT is also featured.

Display Drivers

As a single chip solution Solomon Systech's SSD1905/1906/1908 LCD Graphic Controllers handle the entire image rendering and STN/CSTN/TFT display interface providing a rich display. They will interface with almost any kind of MCU, even low cost 8-bit MCUs. An embedded SRAM frame buffer memory of 80k bytes for the SSD1905 and 256k bytes for the SSD1906/SSD1908 can support from 1 bit-per-pixel colours with 64 grey shades. To reduce software manipulation for animation display the on-chip graphic engine provides command type graphic manipulation such as display rotation, window mode, cursor mode etc. The SSD1908 will drive analogue displays and has a Horizontal Resolution Doubling feature.

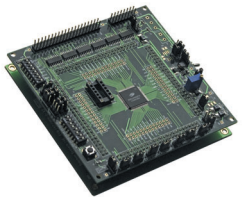
In addition the SSD1921 LCD Graphic Controller has Camera or DVD input port with an image processing unit and JPEG codec. The files can be saved into SD/MMC card, decoded and displayed on the LCD through the LCD interface which supports STN, CSTN and TFT panels.

Solomon Systech Driver ICs for Displays

Part Number	Description	SRAM	Package	LCD Supported
SSD1905QT2	LCD Graphic Controller	80k	TQFP100	STN, CSTN, TFT, HR-TFT
SSD1906QT2	LCD Graphic Controller	256k	TQFP100	STN, CSTN, TFT, HR-TFT
SSD1908QT2	LCD Graphic Controller with Horizontal doubling.	256k	TQFP100	STN, CSTN, TFT, HR-TFT, Analog TFT
SSD1921QL12	LCD Graphic Controller with Camera/DVD Input	256k	LQFP144	STN, CSTN, TFT

Solomon Systech Development Kit

Part Number	Description
DVK1906QT2-1-A3	SSD1906QT2/SSD1908QT2 Dev Kit
EVM190X-0-A2	Dev Kit USB Adapter Board



Touchscreen Controller

The MK712 Touchscreen Controller IC provides all the screen drive, A to D converter and control circuits to easily interface to 4-wire analogue resistive Touchscreen. Available with a choice of package.

IDT Touchscreen Controller IC

Part Number	Description	Package
MK712SLF	Controller IC for 4-wire resistive Touchscreens	SOIC28
MK712RLF	Controller IC for 4-wire resistive Touchscreens	SSOP28

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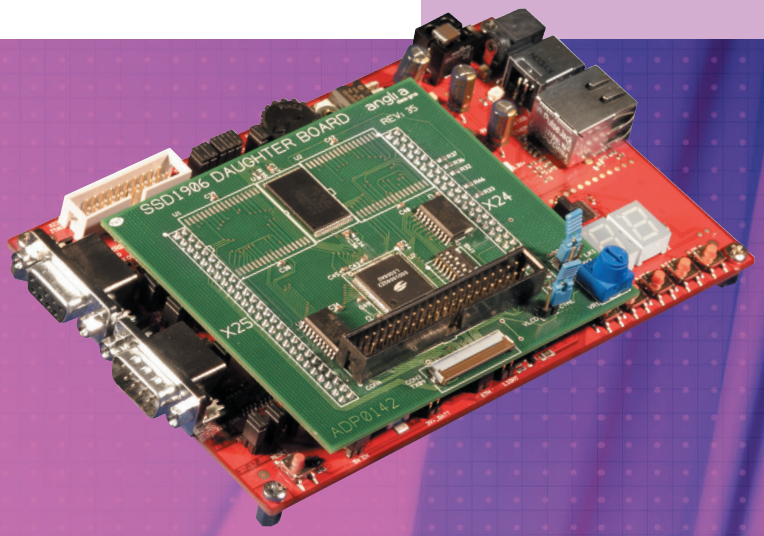
Technical Support & Advice



Design-in Guidance

Introduction

Anglia Displays are able to provide extensive technical support and advice during your assessment and design-in of LCDs. We can also provide starter kits, evaluation boards and reference platforms to enable you to fast track the introduction of your end product.

We can offer :

- Technical support and guidance
- An in-house design team
- On-site labs
- Working knowledge of displays
- Familiarity of software issues
- Availability of starter kits, evaluation boards and reference platforms
- LCD backlight and high end FPGA driving solutions

All arranged to enable you to gain a better understanding of the products, overcome delays and thus speed 'time to market'.

For the very latest information on our entire range of LCDs and accessories, please visit our website :

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Contact details

for dedicated technical support

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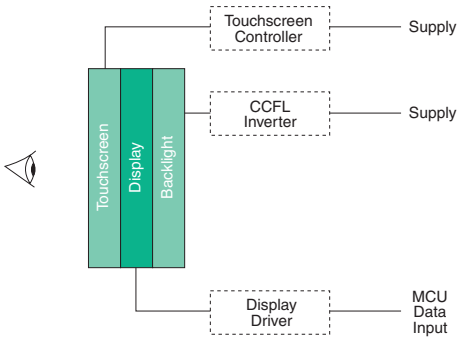
- **Email:**
  support@anglia-displays.com
- **Website:**
  www.anglia-displays.com/support.asp



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Need to know more

A "Glossary of Terms" is provided on page 20 together with details of "Viewing Characteristics".

Glossary of Terms

A definition of various terms and initials used throughout this brochure. Those marked with an asterisk are explained in more detail on the following page.

Active – A display technique by which each pixel is driven by a thin film transistor in the LCD glass

Aspect Ratio – Screen shape defined by the ratio of width to height

Brightness – Light intensity of the display measured in candela per square metre (cd/m2)

CCFL – Cold Cathode Fluorescent Lamp (also known as CFL)*

COB – Chip On Board

COG – Chip On Glass

Contrast – The ratio between the screen's brightest pixels and its darkest pixels

CSTN – Colour Super Twisted Nematic (also known as Colour STN)

EL – Electro-Luminescent backlight*

FFC – Flat Flexible Cable

FSTN – Film compensated Super Twisted Nematic (also known as Film-STN)

HIFAS – High Frequency Amplitude Selection

HTN – High Twisted Nematic

IPS – In-Plane Switching (also known as Super TFT)

LCD – Liquid Crystal Display

LED – Light Emitting Diode backlight*

LVDS – Low Voltage Differential Signalling

Negative Mode Display – Light characters on a dark background

Passive – A display technique by which the rows and columns of pixels are multiplexed

Positive Mode Display – Dark characters on a light background

QVGA – Quarter VGA (offers a screen resolution of 320 x 240)*

Reflective – Viewing mode which uses ambient light only to provide display illumination*

Resolution – Pixel count e.g. 320 x 240

Reversible – A feature which enables a display to be switched from positive to negative mode

SVGA – Super VGA (offers a screen resolution of 800 x 600)*

STN – Super Twisted Nematic

Supply Voltage – Logic supply voltage which on some modules may be separate from the LCD supply

TAB – Chip on Tab

TCP – Tape Carrier Package

TFT – Thin Film Transistor

TN – Twisted Nematic

Transflective – Viewing mode which uses ambient light or backlighting to provide display illumination*

Transmissive – Viewing mode which uses backlighting only to provide display illumination*

VGA – Video Graphics Array (offers a screen resolution of 640 x 480)*

Viewing Angle – The maximum angle at which a display can be viewed with acceptable definition

Viewing Direction – Displays that are best viewed at a direction from below the centre of the screen are defined as 6 o'clock. Displays best viewed above the centre are defined as 12 o'clock

WVGA – Wide VGA (offers a screen resolution of 800 x 480)*

WXGA – Wide Extended Graphics Arrays (offers a screen resolution of 1280 x 800)*

XVGA – Extended VGA (offers a screen resolution of 1024 x 768)*

6 o'clock – See 'Viewing Direction' above

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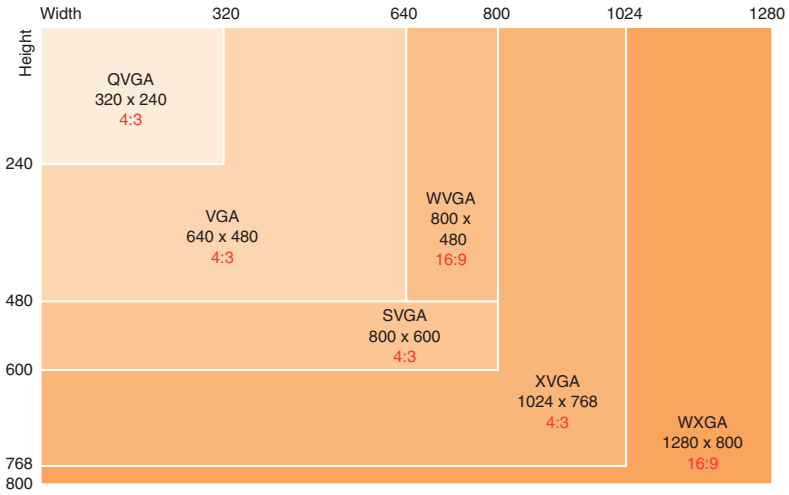
Viewing Characteristics

Screen Shapes, Resolutions & Aspect Ratios



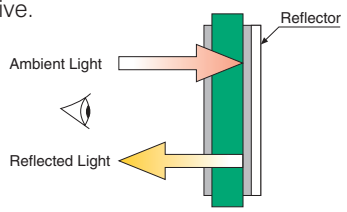
Operating Modes

As liquid crystal displays do not emit light they require external light sources to provide screen illumination. This is achieved by three modes of operation; reflective, transmissive or transflective.

Reflective mode

(for monochrome displays)

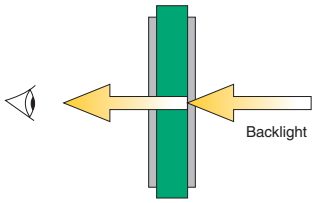
Relies upon the reflection of ambient light, or other front lighting, to illuminate the screen. Simple, effective and low cost. Ideal for energy saving but the displays will not function under dark conditions.



Transmissive mode

(for monochrome and colour displays)

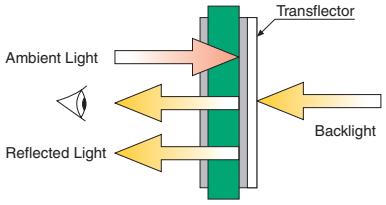
Relies upon powered backlighting to illuminate the screen such as LED, EL or CCFL. Allows TFT and CSTN screens to display full colour. Backlighting needs to be continuously on to enable displays to function.



Transflective mode

(for monochrome displays)

Uses a combination of reflected ambient light for energy saving and powered backlighting (such as LED or CCFL) for situations where ambient light is poor or non-existent.



Backlighting

CCFL: Cold cathode fluorescent lamp that provides a bright illumination of the display in conjunction with a diffuser. Requires a separate high voltage inverter to operate.

EL: Electro-luminescent panel that provides an even illumination of the display without the need for a diffuser. Requires a separate high voltage inverter to operate.

LED: Light emitting diode backlight that provides a long life illumination of the display. Uses a low voltage supply.