General features for **display** Alphanumerical Modules
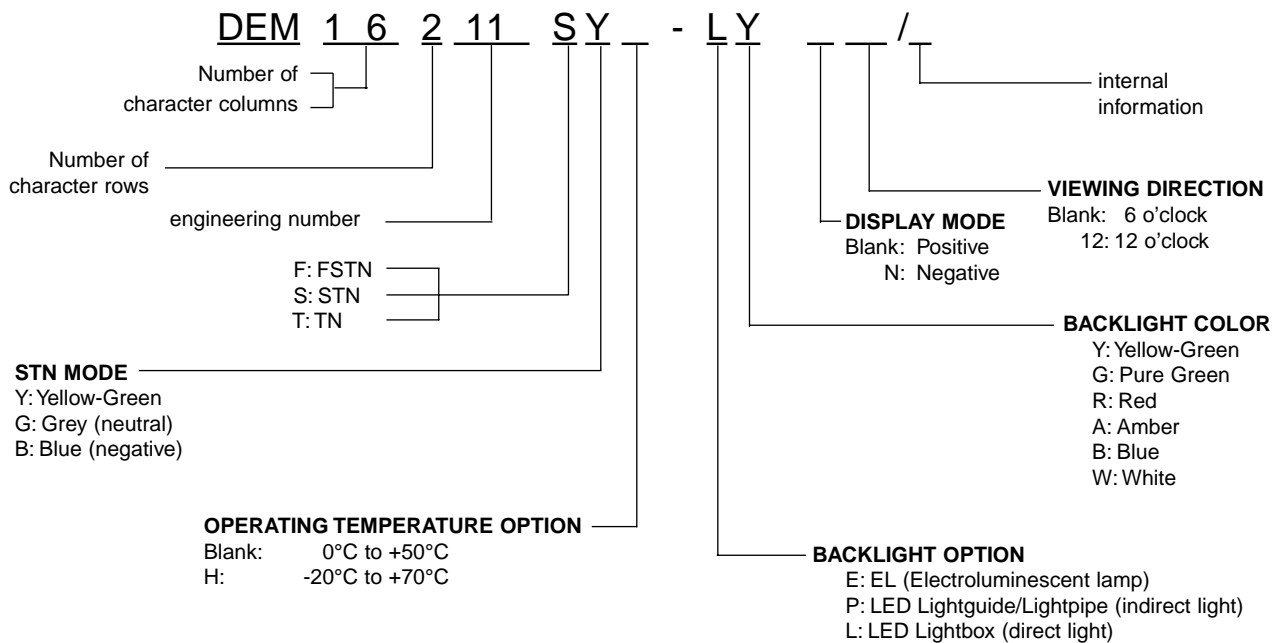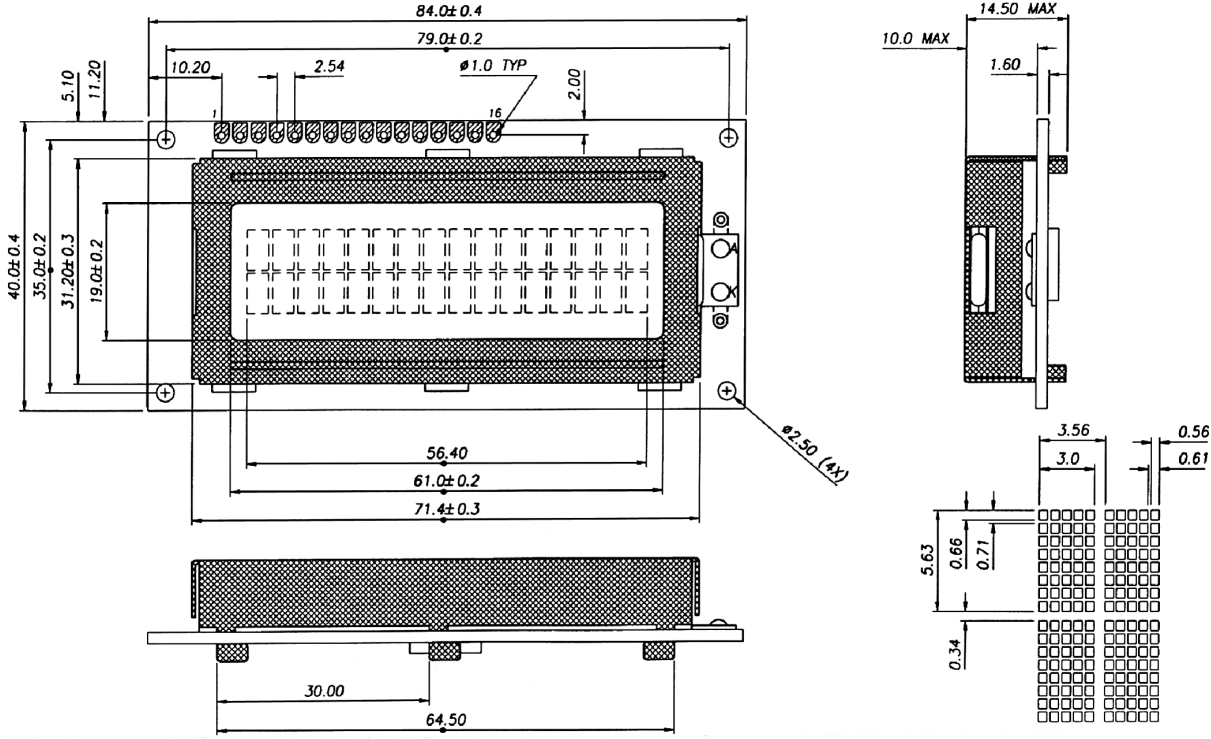
- In the meantime most of our modules operate within wide temperature range (-20°C to +70°C) without negative voltage. Therefore a contrast-voltage of approx. 4,5 Volt is required (against Vdd).

- The twist of 240° causes excellent contrast and improved viewing cone.

- We use a 16 pin version PCB with optional pins for the LED-backlight (A/K)

- Our modules have the LED-limit-resistances already on board. This resistors can be changed or bridged easily. If neccessary the power consumption and brightness can be optimized as per customers request.

- LED-polarity can be changed. To swop the LED-polarity our boards provide this possibility.

- The metallbezel is set on ground. If neccessary our boards are prepared for disconnection.

New technical concepts allow us to achieve wide temperature range modules without price increase. We are always interested in very good availability. If you do not find a product which can fit in your application we have the possibility to make a custom- or semicustom design already at low volumes and economical price level.
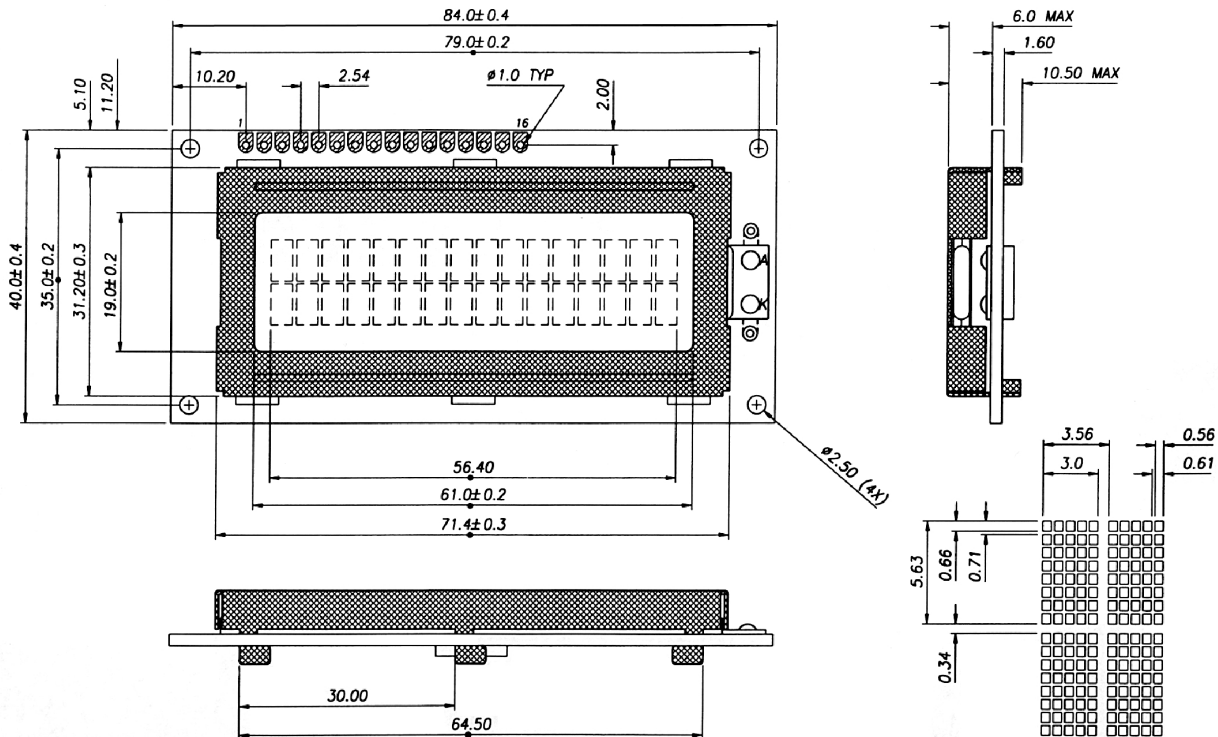
ORDERING INFORMATION

DEM 1 6 2 11 S Y - L Y _ _ / _

Number of character columns

Number of character rows

engineering number

F: FSTN
S: STN
T: TN

STN MODE
Y: Yellow-Green
G: Grey (neutral)
B: Blue (negative)

OPERATING TEMPERATURE OPTION
Blank: 0°C to +50°C
H: -20°C to +70°C

internal information

VIEWING DIRECTION
Blank: 6 o'clock
12: 12 o'clock

DISPLAY MODE
Blank: Positive
N: Negative

BACKLIGHT COLOR
Y: Yellow-Green
G: Pure Green
R: Red
A: Amber
B: Blue
W: White

BACKLIGHT OPTION
E: EL (Electroluminescent lamp)
P: LED Lightguide/Lightpipe (indirect light)
L: LED Lightbox (direct light)

DEM16211 (Lightbox)

DEM16211 (Lightpipe)

Group 3 - A. num. Dot Matrix 11/02

02

DEFINITION OF TERMINALS

(valid for all modules except DEM 16223/16224/40491)

PIN NO.	SYMBOL	FUNCTION
1	V_{SS}	Ground terminal of module
2	V_{DD}	Supply terminal of module +5V
3	V_O	Power supply for Liquid crystal Drive
4	RS	Register Select RS = 0 ... Instruction Register RS = 1 ... Data Register
5	R/W	Read/Write R/W = 1 ... Read R/W = 0 ... Write
6	E	Enable
7 - 14	DB0–DB7	Bi-directional Data Bus, Data Transfer is performed once, thru DB0-DB7, in the case of interface data. Length is 8-bits; and twice, thru DB4-DB7, in the case of interface data length is 4-bits. Upper four bits first then lower four bits.
15 16	L- L+	LED or EL lamp power supply terminals.

OPERATING SPECIFICATIONS

	NORMAL TEMP
Operating temperature range	0°C to +50°C
Storage temperature range	-10°C to +60°C
Operating relative humidity	90% max
	WIDE TEMP
Operating temperature range	-20°C to +70°C
Storage temperature range	-30°C to +75°C
Operating relative humidity	90% max

POWER SUPPLY REQUIREMENTS

• **Normal Temperature and Wide Temperature Range**
  - Only 5 Volt (V_{DD}) - FLUID SOLUTION
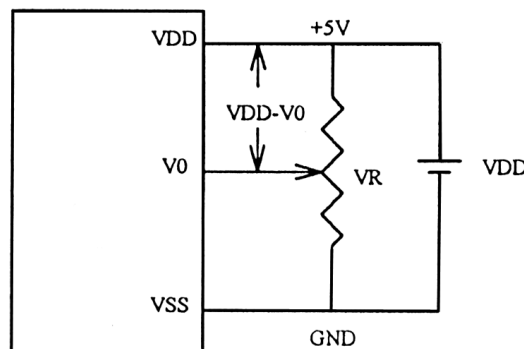
V_{DD} - V_O: LCD Driving Voltage

Vr: 10K - 20K

Please note:
Older module technologies may require negative voltage.