

INCH-POUND

MIL-DTL-28803/3D
6 September 2013
SUPERSEDING
MIL-D-28803/3C
3 August 1990

DETAIL SPECIFICATION SHEET

DISPLAY, OPTOELECTRONIC, SEGMENTED READOUT, BACKLIGHTED,
STYLE I (INCANDESCENT, DOT PATTERN AND BAR PATTERN,
RFI SHIELDED, MOISTURE SEALED, TYPE R03

This specification sheet is approved for use by all Departments
and Agencies of the Department of Defense.

The requirements for acquiring the product described herein
shall consist of this specification sheet and [MIL-DTL-28803](#).

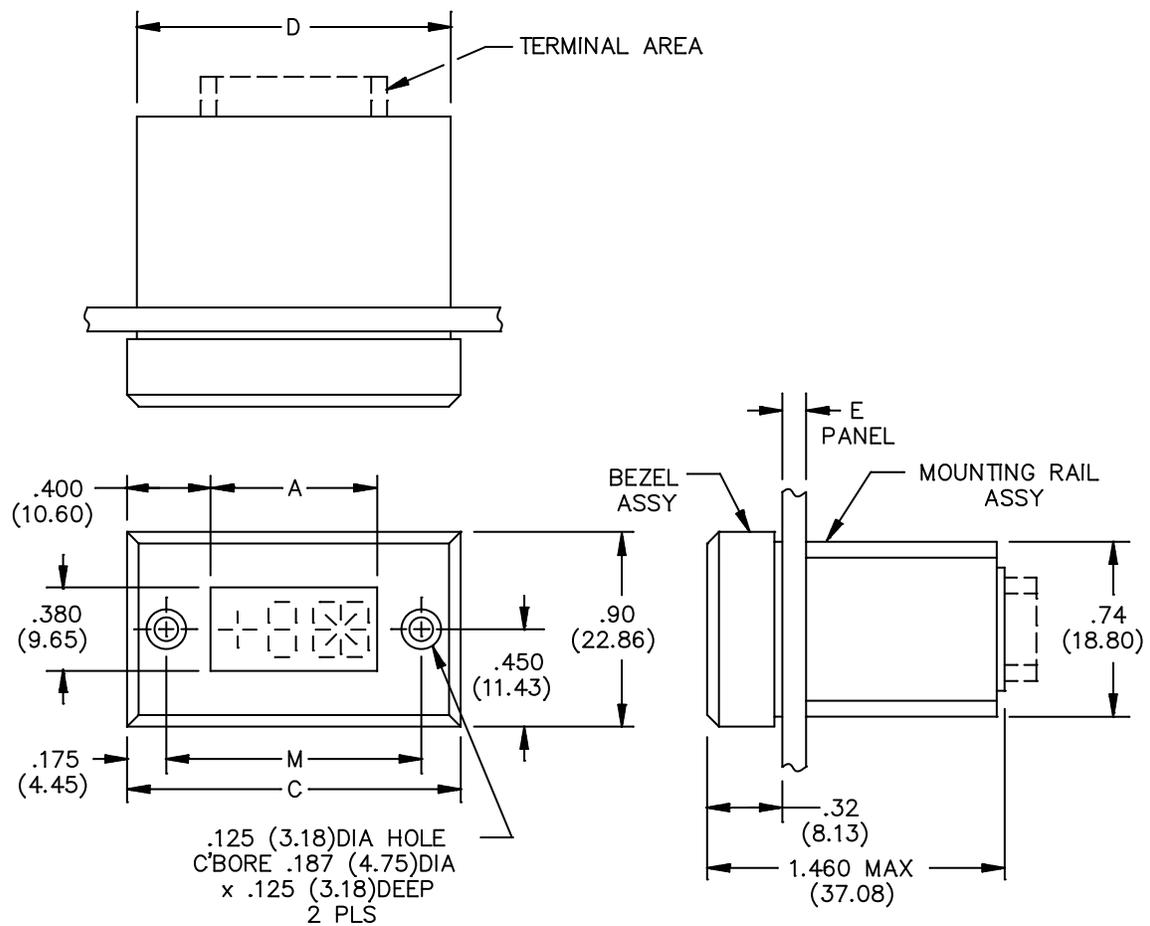


FIGURE 1. Type R03 display.

NOTES:

1. Dimensions are in inches. Millimeter equivalents are given for general information only.
2. Unless otherwise specified, tolerances are ± 0.02 inch (0.51 mm) for two place decimals and ± 0.010 inch (0.25 mm) for three place decimals.
3. Design configuration optional within envelope as shown.
4. The values for dimensions A, C, D, E, and M are listed in table I.

FIGURE 1. Type R03 display – Continued.

TABLE I. Display assembly and parts dimensions. ^{1/} ^{2/}

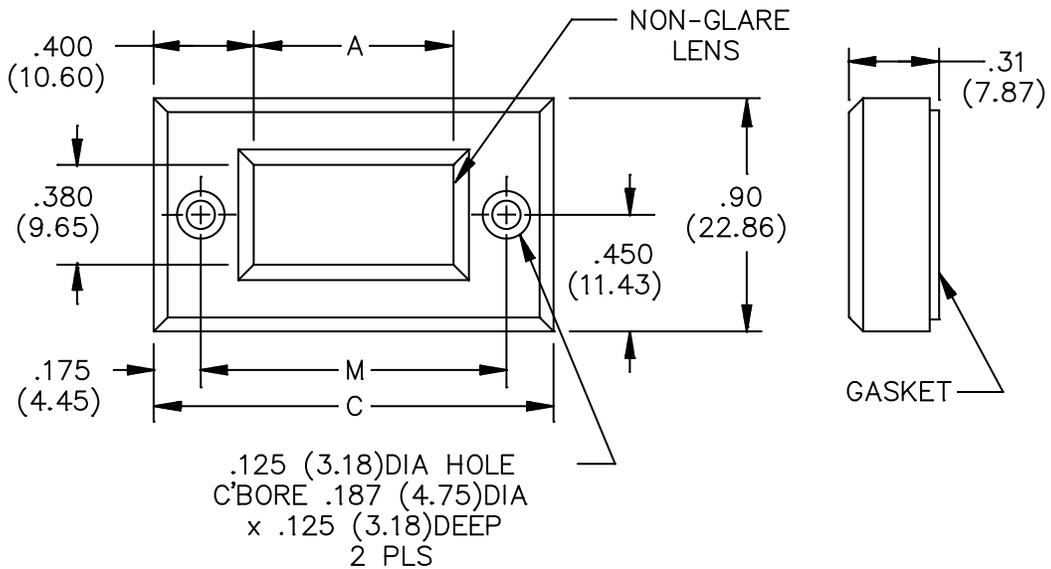
Dimension	Calculation ^{3/}
A	$L + .10$ (2.54)
M	$L + .55$ (13.97)
C	$L + .90$ (22.86)
D	$L + .80$ (20.32)
E	(See figure 3 and table IV)

- ^{1/} Dimensions are in inches. Millimeter equivalents are given for general information only.
- ^{2/} Unless otherwise specified, tolerances are ± 0.02 inch (0.51 mm) for two place decimals and ± 0.010 inch (0.25 mm) for three place decimals.
- ^{3/} Dimension L derived from table II.

TABLE II. Calculation for dimension L.

Type of module ^{1/}	Calculation for L ^{2/} ^{3/}
Two 7 segment and two decimal points	Multiply the number of modules by $x .60$ (15.24)
Three 7 segments	Multiply the number of modules by $x .60$ (15.24)
16 segment	Multiply the number of modules by $.40$ (10.16)
9 segment	Multiply the number of modules by $.40$ (10.16)
Two 7 segment and one decimal point	Multiply the number of modules by $x .40$ (15.24)
7 segment	Multiply the number of modules by $.20$ (5.08)
4 segment	Multiply the number of modules by $.20$ (5.08)
Colon, decimal point, or degree	Multiply the number of modules by $.20$ (5.08)
North – South East – West	Multiply the number of N/S or E/W by $.40$ (10.16)

- ^{1/} See [table VII](#) for module description.
- ^{2/} Dimensions are in inches. Millimeter equivalents are given for general information only.
- ^{3/} Unless otherwise specified, tolerances are ± 0.02 inch (0.51 mm) for two place decimals and ± 0.010 inch (0.25 mm) for three place decimals.



NOTES:

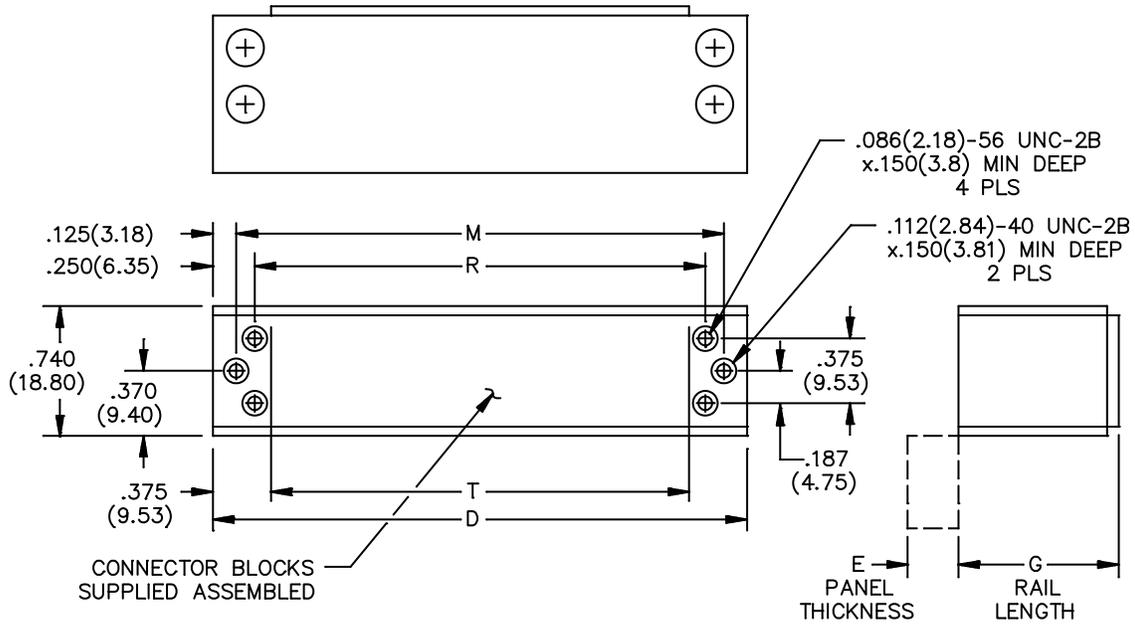
1. Dimensions are in inches. Millimeter equivalents are given for general information only.
2. Unless otherwise specified, tolerances are $\pm .02$ inch (0.51 mm) for two place decimals.
3. Design configuration optional within envelope as shown.
4. The values for dimensions A, C, and M are listed in [table I](#).

FIGURE 2. Bezel assembly.

TABLE III. Mounting rail assembly dimensions. 1/ 2/

Dimension	Calculation <u>1/</u> <u>2/</u>
T	L + .05 (1.27)
R	L + .30 (7.62)
M	L + .55 (13.97)
D	L + .80 (20.32)

- 1/ Dimensions are in inches. Millimeter equivalents are given for general information only.
- 2/ Unless otherwise specified, tolerances are $\pm .02$ inch (0.51 mm) for two place decimals and $\pm .010$ inch (0.25 mm) for three place decimals.



NOTES:

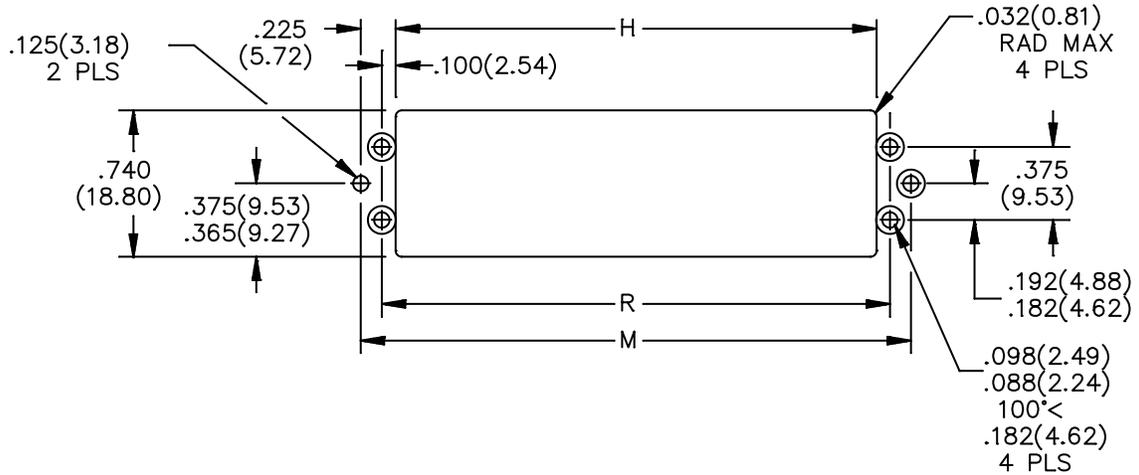
1. Dimensions are in inches. Millimeter equivalents are given for general information only.
2. Unless otherwise specified, tolerances are ± 0.02 inch (0.51 mm) for two place decimals and ± 0.010 inch (0.25 mm) for three place decimals.
3. Design configuration optional within envelope as shown.
4. The values for dimensions D, M, R, and T are listed in table III. The values for dimensions E and G are listed in [table IV](#).

FIGURE 3. Mounting rail assembly.

TABLE IV. Mounting rail assembly panel thickness. 1/ 2/

Dimension E		Dimension G	
Inches	mm	Inches	mm
.063	1.60	1.05	26.7
.093	2.36	1.02	25.9
.125	3.18	.99	25.1
.190	4.83	.92	23.4
.250	6.35	.86	21.8

- 1/ Dimensions are in inches. Millimeter equivalents are given for general information only.
- 2/ Unless otherwise specified, tolerances are ± 0.02 inch (0.51 mm) for two place decimals and ± 0.010 inch (0.25 mm) for three place decimals.



NOTES:

1. Dimensions are in inches. Millimeter equivalents are given for general information only.
2. Unless otherwise specified, tolerances are $\pm .010$ inch (0.25 mm) for three place decimals.
3. Design configuration optional within envelope as shown.
4. The values for dimensions H, M, and R are listed in [table V](#).

FIGURE 4. Panel cut-out dimension.

TABLE V. Panel width cutout dimension.

Dimension	Calculation
H	$L + .100$ (5.24)
R	$L + .300$ (7.62)
M	$L + .550$ (13.97)

- 1/ Dimensions are in inches. Millimeter equivalents are given for general information only.
- 2/ Unless otherwise specified, tolerances are $\pm .010$ inch (0.25 mm) for three place decimals.

REQUIREMENTS:

Design and construction:

Dimensions and configurations: See [figures 1](#) through [4](#) and [tables I](#) through [V](#).

Display assembly: The complete multi-station display assembly shall be assembled and consist of the following:

- a. Bezel assembly with lens and panel gasket.
- b. Mounting rail assembly.
- c. Module assemblies in accordance with [MIL-DTL-28803/4](#).
- d. Lamp assemblies in accordance with [MIL-DTL-28803/4](#).
- e. Connector blocks in accordance with [MIL-DTL-28803/4](#).
- f. Insertable crimp-type terminals (packaged separately) in accordance with [MIL-DTL-28803/4](#).

RFI shielding: Grounded RFI panel gasket shall be provided.

Mounting flange: Front face of mounting flange shall be a black lusterless color.

Weight:

Bezel assembly: 11.0 grams maximum when dimension L = .20 inch (mm). Add 0.1 gram for each additional .20 inch increment.

Mounting rail assembly: 26.0 grams maximum when dimension L = .20 inch (mm). Add 2.5 grams for each additional .20 inch increment.

All other components: See [MIL-DTL-28803/4](#).

Light source: T-3/4 incandescent bulb.

Front lens plate: The display shall appear obscured in the unlighted condition. In the lighted condition, characters shall appear incandescent white on a black background (see [table VIII](#)).

Lens material: Neutral density filter (nonglare).

Color: Incandescent white in accordance with [table VIII](#).

Operating:

Dot to dot ratio:

Segment to segment: 3 to 1 maximum.

Digit to digit: 3 to 1 maximum.

Optical:

Chromaticity: Method I in accordance with [MIL-DTL-28803](#).

Contrast ratio:

Prior to life (electrical): 10 to 1 minimum.

After life (electrical): 4 to 1 minimum.

Luminance: Average 300 foot-lamberts (1027.9 Candela per square meter) minimum with a supply of 5 volts.

Physical and mechanical:

Mechanical endurance: Not applicable.

Solderability: Not applicable.

Terminal strength: The terminals shall be tested in accordance with Method 211 of [MIL-STD-202](#), with the following details and exceptions: Test condition letter A, with an applied force of 5 pounds (2.27 Kg) in accordance with [MIL-DTL-28803](#).

Electrical:

Supply voltage: 5 volts maximum.

Supply current (each lamp): .025 ampere maximum.

Environmental:

Shock: Method I in accordance with [MIL-DTL-28803](#).

Vibration: Grade 2 in accordance with [MIL-DTL-28803](#).

Operating temperature: -55°C to +71°C.

Storage temperature: -55°C to +85°C.

TABLE VI. Code letters for type of display (dot matrix or bar matrix) and panel thickness.

Code	Type of display	Panel thickness <u>1/</u> <u>2/</u>
1	Dot matrix	.250 (6.35)
2	Dot matrix	.190 (4.83)
3	Dot matrix	.125 (3.18)
4	Dot matrix	.063 (1.60)
5	Dot matrix	.093 (2.36)
6	Bar matrix	.250 (6.35)
7	Bar matrix	.190 (4.83)
8	Bar matrix	.125 (3.18)
9	Bar matrix	.063 (1.60)
0	Bar matrix	.093 (2.36)

1/ Dimensions are in inches. Millimeter equivalents are given for general information only.

2/ Unless otherwise specified, tolerances are ± 0.010 inch (0.25 mm) for three place decimals.

TABLE VII. Code letters for MIL-DTL-28803/4 module assemblies.

Code letter	Display	Type of module
A		Colon, degree, or decimal
B		16 segment alpha-numeric
C		Two 7 segment numeric
D		4 segment sign and 7 segment numeric
E		Colon and 7 segment numeric

TABLE VII. Code letters for [MIL-DTL-28803/4](#) module assemblies – Continued.

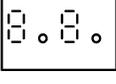
Code letter	Display	Type of module
F		7 segment numeric and colon
G		Three 7 segment numeric
H		4 segment sign and two 7 segment numeric
J		Colon and two 7 segment numeric
K		7 segment numeric, colon, and 7 segment numeric
L		Two 7 segment numeric and colon
M		Two 7 segment numeric and 4 segment sign
T		North – South
U		East – West
V		7 segment numeric, decimal, and 7 segment numeric
W		7 segment numeric, decimal, 7 segment numeric, and decimal

TABLE VIII. Illuminated chromaticity limits.

Color	@ 2100° Kelvin	
	X	Y
Incandescent white <u>1/</u>	.500	.400
	.500	.450
	.550	.400
	.550	.450

1/ Unfiltered incandescent light.

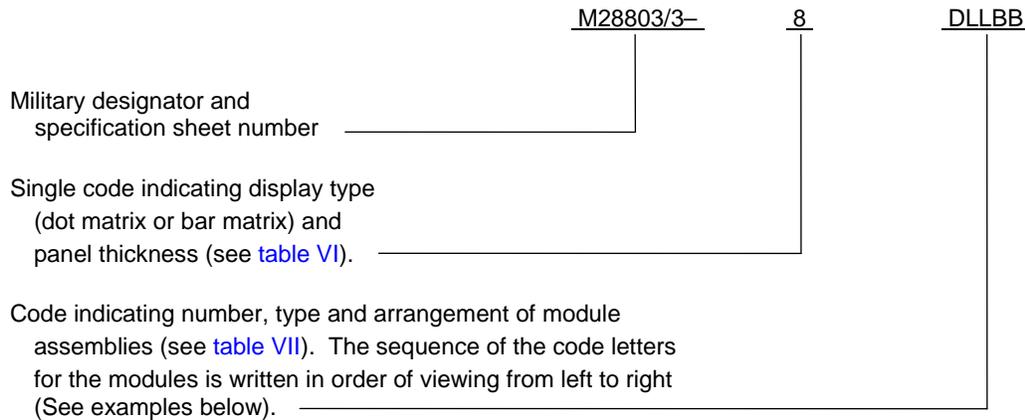
QUALIFICATION:

Qualification and group B inspection: See table IX.

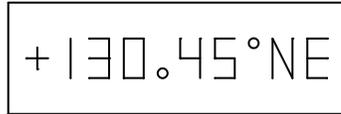
TABLE IX. Qualification and group B inspection – group submission.

PIN	Number of samples required	Tests	Extent of approval
M28803/3-2LC	2	All applicable tests in accordance with the qualification and group B inspection table of MIL-DTL-28803 . In group IV, contrast ratio shall be tested before and after life (electrical).	All PINs
M28803/3-7LC	2		
M28803/3-2CG	2		
M28803/3-7CG	2		
M28803/3-2DCEFB	1		
M28803/3-7DCEFB	1		

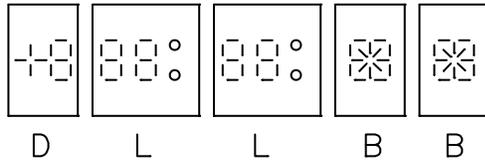
Part or Identifying Numbers (PIN): The PIN shall consist of the letter "M" followed by the basic number of the specification sheet, and a coded symbol indicating the type of display, panel thickness, and arrangement of the module assemblies. See example:



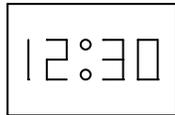
EXAMPLE:



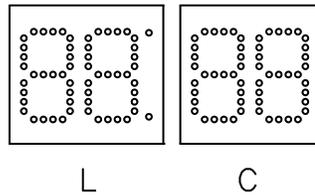
.125 PANEL, +130.45° NE
M28803/3-8DLLBB
(BAR MATRIX SEGMENTS)



EXAMPLE:



.250 PANEL, 12:30
M28803/3-1LC
(DOT MATRIX SEGMENTS)



Reference documents. In addition to [MIL-DTL-28803](#), this document references the following:

- [MIL-STD-202](#)
- [MIL-DTL-28803/4](#)

The margins of this specification sheet are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:
Army – CR
Navy – EC
Air Force – 85
DLA – CC

Preparing activity:
DLA – CC

Project 5980–2013–003

Review activities:
Army– AR, AT, AV, CR4, MI
Navy – AS, MC, OS, SH
Air Force – 99

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