

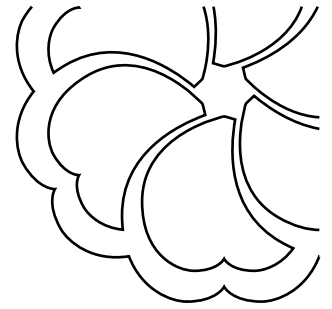
# Digital instrument cluster VIC Laplace Z

*specification*

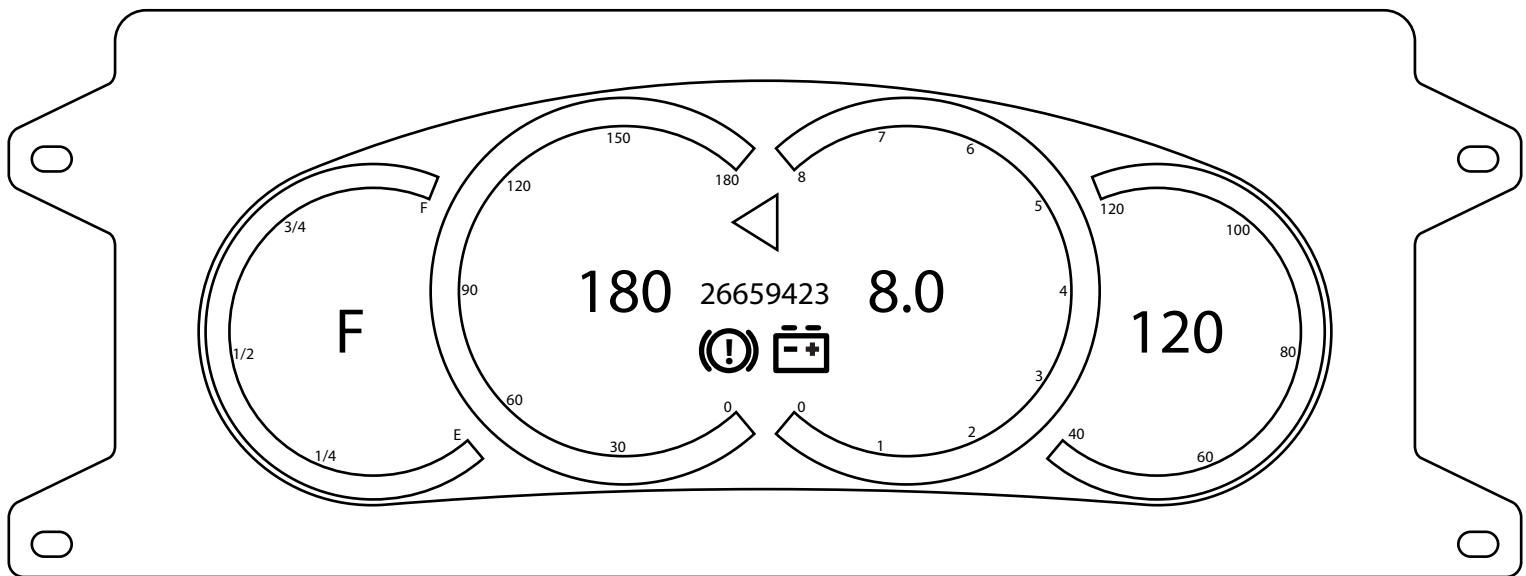
*version alpha*

# 1

## General description



VIC Laplace Z is a rugged automotive digital instrument cluster. This high-performance embedded graphics processor features high-brightness wide display, avionic aluminum housing and aerospace interface connector.



**Fig. 1.** VIC Laplace Z.

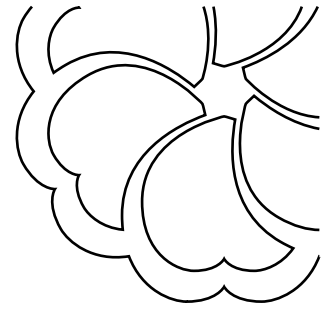
Cluster hardware is optimized for ultimate graphics performance and instant startup time.

As result the cluster has 60 *Hz* both display refresh rate and graphics frame rate — that is the display shows 60 frames per second and every frame is freshly built by graphics engine.

The cluster loads graphics and starts up in a fraction of a second.

# 2

## Display



VIC Laplace Z is equipped with a rugged, high-brightness and high-contrast display of 1280×480 resolution and 8:3 aspect ratio.

### Display data

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view area size	293.76 <i>mm</i> ×110.16 <i>mm</i>
resolution	1280×480
aspect ratio	8:3
color resolution	18 <i>bit</i>
brightness	1000 <i>cd/m<sup>2</sup></i>
contrast ratio	800
refresh rate	60 <i>Hz</i>
operating temperature	-30°C–80°C

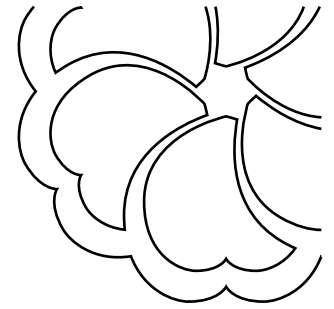
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**Table 1.** VIC Laplace Z display data.

The display diagonal is 314 *mm* or 12.5".

# 3

## Hardware



At its core VIC Laplace Z has Arm architecture plus 2D and 3D graphics engines capable of 60 *fps* frame rate for mixed scenes.

### Hardware data

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core frequency	400 <i>MHz</i>
graphics engine	2D and 3D
frame rate	60 <i>Hz</i>
flash memory	64 <i>MB</i>
DDR memory	128 <i>MB</i>
MRAM memory	256 <i>kB</i>
operating temperature	-40°C–85°C

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**Table 2.** VIC Laplace Z hardware data.

The cluster has on-board three types of memory:

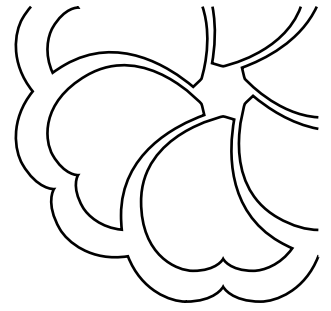
*flash* — for storing the graphics and code in off state

*DDR* — dynamic memory for graphics processing

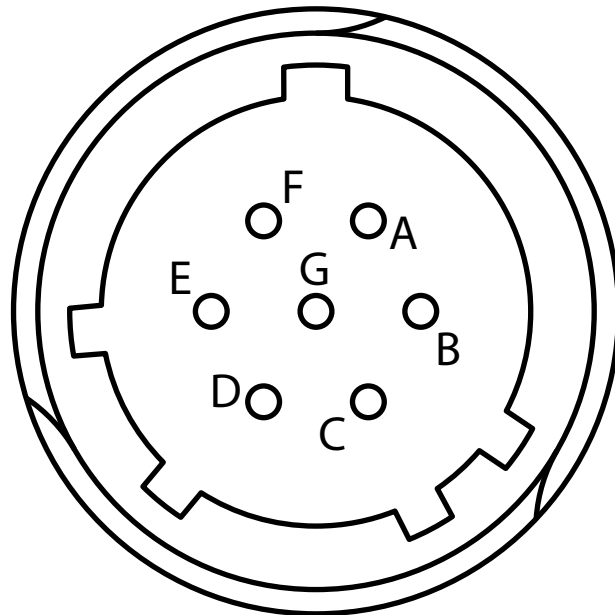
*MRAM* — magnetoresistive memory for storing temporary data

Like *flash*, *MRAM* can store data in off state. But unlike *flash*, *MRAM* has unlimited resource of rewrite cycles, which makes it a perfect choice for frequently saved data storage like odometer, trip counter and settings.

# 4 Connector



VIC Laplace Z has the only aerospace subminiature connector of *Tri-Start* series. The connector features high-performance gold plated pins.

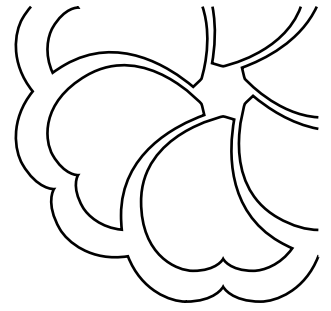


**Fig. 2.** VIC Laplace Z connector.

The mating plug is *D38999/26Z-B99SN*.

# 5

## Interface



VIC Laplace Z has a digital interface — two *CAN* buses and an *Enable* line.

<b>Pinout</b>	
A	CAN2-
B	CAN2+
C	Enable
D	Power +12 V
E	CAN1+
F	CAN1-
G	Power -12 V

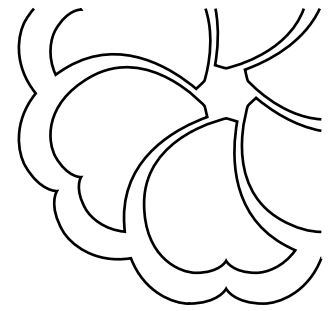
**Table 3.** VIC Laplace Z pinout.

The bus *CAN1* usually is used as the main data bus — for instance, standard *J1939*. The bus *CAN2* usually is programmed as custom control bus for instrument cluster control — brightness adjusting, mode switching and trip counter resetting. The buses are capable of up to 1 *Mb/s* transfer rate.

The *Enable* input is used for the instrument cluster startup and shutdown and could be connected to the ignition line of the vehicle. Its operating range is 4 V–80 V.

# 6

## Electrical data



Digital instrument cluster VIC Laplace Z is designed to be used in 12 V systems and features the highest level of protection. Due to robust power stage it could be used in 24 V systems with corresponding precautions.

### Electrical data

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nominal power	12 V
operating range	6 V–80 V
reverse battery protection	<i>yes</i>
double battery protection	<i>yes</i>
power transient protection	IV level of <i>ISO 7673-2</i>
power dump protection	IV level of <i>ISO 16750-2</i>

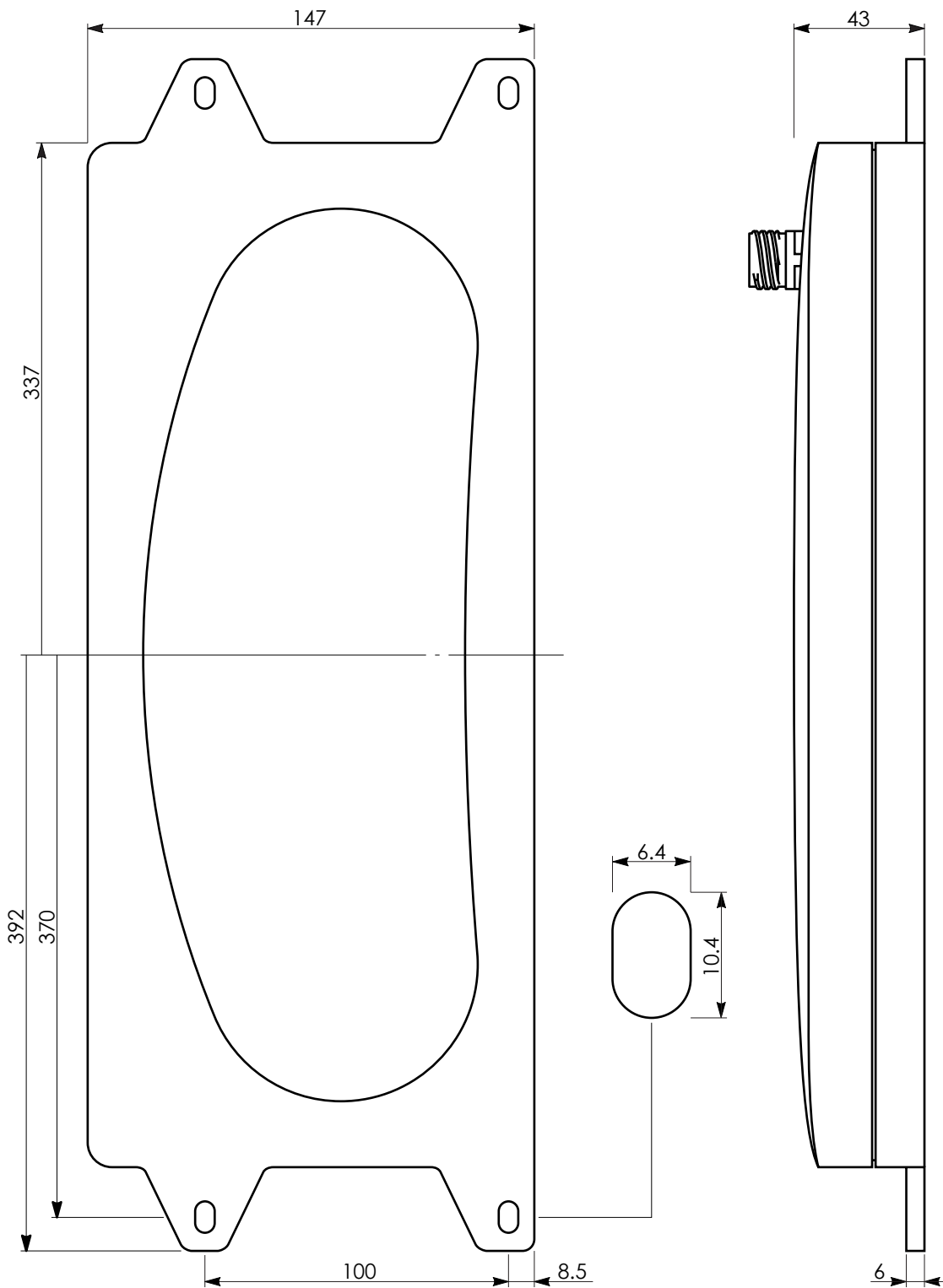
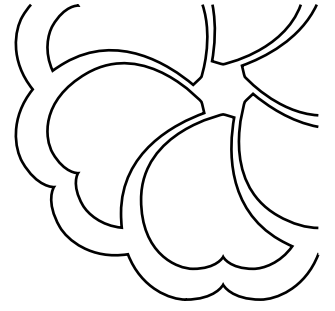
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**Table 4.** VIC Laplace Z electrical data.

As extra VIC Laplace Z features soft startup and gracious shutdown.

# 7

## Dimensions

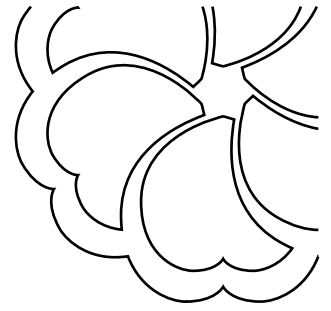


**Fig. 3.** VIC Laplace Z dimensions.



# 8

## Options



Custom options for digital instrument cluster VIC Laplace Z:

custom graphical design

custom housing

custom programming

ambient light stereo sensing — used for automatic brightness adjusting

If your project requires options beyond listed here, write us to create a new device from scratch.

### **Our address**

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