



## IPC/RSL-R 81

This fanless RML-R COMPACT81 generation is based on the Intel® Atom™ E3900 (Apollo Lake) processor technology and offers a wide range of interface options. The robust and uncompromising industrial design allows the implementation in the most demanding rolling stock applications and guarantees long term availability.

- **Railway approved (EN50155 & EN45545)**
- **24/7 continuous operation**
- **M12 connectors for Power and LAN**
- **Shock and vibration resistant**
- **Full -40...+85°C on component level**



### Product Highlights

Power Ignition controller  
 Inertial Measurement Unit (IMU)  
 GNSS with dead reckoning  
 Fanless, No moving parts  
 Maintenance free  
 Long term availability

### Product Features

Intel® Atom™ E3900 Series  
 up to 2.0GHz, 4 Cores  
 RAM soldered on board 8GB  
 Socket for CFast storage card  
 Gbit Ethernet, USB 3.1, RS232, CAN  
 Optional 5G, 4G, Wi-Fi & Bluetooth options  
 Rugged M12 connectors  
 Stainless steel housing  
 Protection class IP40

### Markets / Applications

Railway (rolling stock)  
 Transportation

**Processor / Performance**

Intel® Atom™ x7-E3950 2.00GHz (Burst) | 1.6GHz Clock - Quad Core | 8GB RAM

Intel® Atom™ x5-E3940 1.80GHz (Burst) | 1.6GHz Clock - Quad Core | 4GB RAM

**Memory**

L2 cache

2MB

RAM DDR3L 1866MT/s soldered on board

8GB

**Features**

Inertial measurement unit (IMU) STMicroelectronics ISM330DHCXTR

Real time clock (RTC) with goldcap backup (holds charge for 48h)

Hardware watchdog &amp; Temperature supervisor

Intelligent power management (Ignition controller)

TPM 2.0 according to ISO/IEC11889 Infineon SLB9665

**Communication Interfaces**

DisplayPort 1.4 (up to 7680 x 4320 @ 60Hz)

1

USB version 3.1

(Type A)

2

Ethernet 10/100/1000 Mbit (Intel I210-IT)

(M12 female x-coded)

2

CAN 2.0A/2.0B &amp; CAN FD (PEAK FPGA chip, SJA1000 compatible), isolated

(DSUB9)

2

The CAN signals give no network feedback and are attached via non-volatile I/O port on the I2C bus

Serial RS232, isolated

(DSUB9)

optional

CFast socket with retention frame <sup>2</sup>

1

M.2 Key B socket <sup>2</sup>

(M.2 3042)

1

M.2 Key E socket <sup>2</sup>

(M.2 2230)

1

Mini PCIe socket <sup>2</sup>

1

MicroSD Card socket <sup>2</sup>

1

Buzzer <sup>2</sup>

1

I2C bus <sup>2</sup>

1

**Wireless Connectivity**Cellular 4G module (3G/2G fallback) Sierra Wireless EM7455 - M2M only!  
with dual nano SIM support

2x SMA

Wireless LAN IEEE 802.11ac/a/b/g/n/ dual-band 2x2 MIMO SparkLAN WxxB-263ACNI(BT)

2x RP-SMA

GNSS positioning module with dead reckoning u-blox NEO-M9 Module <sup>3</sup>

1x SMA

Cellular 5G module (4G/3G fallback) Sierra Wireless EM9191 - M2M only!

(2x SMA)

optional

High accuracy GNSS positioning module w/ RTK support u-blox ZED F9P module

(1x SMA)

optional

**Technical Data**

Exterior dimensions [mm]

w262 x h53 x d137

Net weight [gram]

~ 1850

Input voltage (isolated and reverse polarity protected)

(M12 4P male a-coded)

16.8 ... 45VDC

Wide input voltage 14.4 .. 137.5VDC (isolated and reverse polarity protected)

(M12 4P male a-coded)

optional

Uninterruptible power supply (UPS), interruption time of supply voltage

~ 10-15s

Current consumption typ. in mA @ 24V without Add-Ins, idle

~ 500

Power consumption typ. in Watt @ 24V without Add-Ins, idle

~ 12

**Environmental Conditions**Operating temperature (complies with EN50155 class OT4) <sup>4</sup>

-40°C ... +70°C

Storage temperature

-40°C ... +85°C

Ingress Protection standard EN60529

IP40

Conformal coating<sup>5</sup>

PCX

Shock

EN61373

Vibration

EN61373

EMI-Conformity

EN50121-3-2

Safety (designed to meet)

EN62368-1

Fire protection

EN45545-2 HL3

Radio and Telecommunication (designed to meet)

RED

MTBF @ 25°C according to Telcordia SR-332, Environment GB, excluding optional extensions

~ 480 000h

<sup>1</sup> Please contact factory for minimum order quantities<sup>2</sup> Internal connector<sup>3</sup> NEO M9 Series, NEO-M9L (with dead reckoning) is planned, however subject to availability the NEO-M9N (without dead reckoning) may be used prior.<sup>4</sup> Depending on installation situation and interface connection. Please see user documentation.<sup>5</sup> On all possible components (excl. connectors and wireless devices)