

LiveLink 4 - 728/J8518

Technical Manual

Issue 1.0

20 January 2021

DOCUMENT SECURITY CLASSIFICATION

Public

No existing release restrictions other
than normal non disclosure rules

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Overview

The LiveLink 4 is a battery-backed vehicle tracking and telematics unit utilising GPS, GSM / GPRS, BLE and Wi-Fi technology.



Installation

LiveLink 4 units are designed to be installed both within the vehicle cab in a protected environment and externally fitted.

Depending on the application the device may be permanently powered, or only powered periodically. In either application, the LiveLink 4 is designed to make efficient use of the power available through the use of sleep modes when there is no activity.

When selecting a suitable mounting location, please be aware of:

- Excessive temperatures
- Corrosive fluids
- Areas where the unit may obstruct the driver's view or impede the operation of the vehicle
- Locations that may shield the unit affecting GPS and/or GPRS reception.
- Unit and antenna separation distance of at least 20cm from all persons, animals and other antennae or transmitters.
- Local or international regulations regarding the fitment of equipment within vehicles.

The installation must be carried out following FCS1362:2010 or later, by a Microlise approved installer. The recommend installation to vehicles is to be mounted on 2 x M5 fixings, tightened to 2Nm.

For installation the unit must be fused on the power input at 2A, and on the ignition input at 1A using automotive fuses and fuse holders tested to relevant safety standards appropriate for the intended country of use.

The minimum connections to the vehicle for unit operation are listed below.

Connection	Pin Number	Fused
Power	4M	Yes – 2A
Ignition	2M	Yes – 1A
Ground	3M	No
Ignition Ground	2L	No

Refer to relevant product guidelines and vehicle surveys for installation specifics.

Description of operation

Providing external power is applied, or the internal battery is sufficiently charged, and the unit is within GPS and GPRS coverage the unit will periodically (based on time and/or distance, and configuration) transmit location and telematics information to the relevant Microlise system.

If out of GPRS coverage then messages are stored into non-volatile Flash memory for transmission later when a GPRS connection can be established.

Whilst operating on external power the unit will charge the internal battery as required.

Two CAN interfaces are incorporated which are typically used to either listen for or request information on automotive CAN busses.

The unit incorporates an RS232 interface which can be used for connection of a variety of peripherals, e.g. Mobile Data Terminals, refrigeration temperature monitoring equipment, printers, sensors or other devices.

The unit incorporates six digital inputs. One is available for monitoring ignition status, another for engine run, the remainder are general-purpose inputs which can be used for monitoring doors switches, panic buttons or other digital signals.

A real-time clock is incorporated for time-stamping all events recorded by the unit.

The unit monitors its internal temperature. Battery charging is only permitted when the temperature is within the specified limits of the battery pack.

The Bluetooth interface can be used for diagnostics or connection to peripheral devices, e.g. a data terminal.

A Bluetooth Low Energy interface is available for monitoring a variety of BLE devices and tags.

The unit is fitted with internal GSM, GPS, Bluetooth and Wi-Fi antennas.

The built-in accelerometer can be used to monitor harsh braking, acceleration, cornering, and any lean of the vehicle.

The built-in modem supports four GSM frequency bands, seven UMTS frequency bands, and nineteen LTE frequency bands (see Technical Specification section for details).

The LiveLink 4 supports the application of firmware and configuration to allow specific user and vehicle profiles and functionality. These are applied by Microlise only and are not accessible to the end-user. The firmware and configuration do not affect the performance of the integrated RF modules, and changes to firmware and configuration do not affect the approval compliance of the product.

Service / Repair

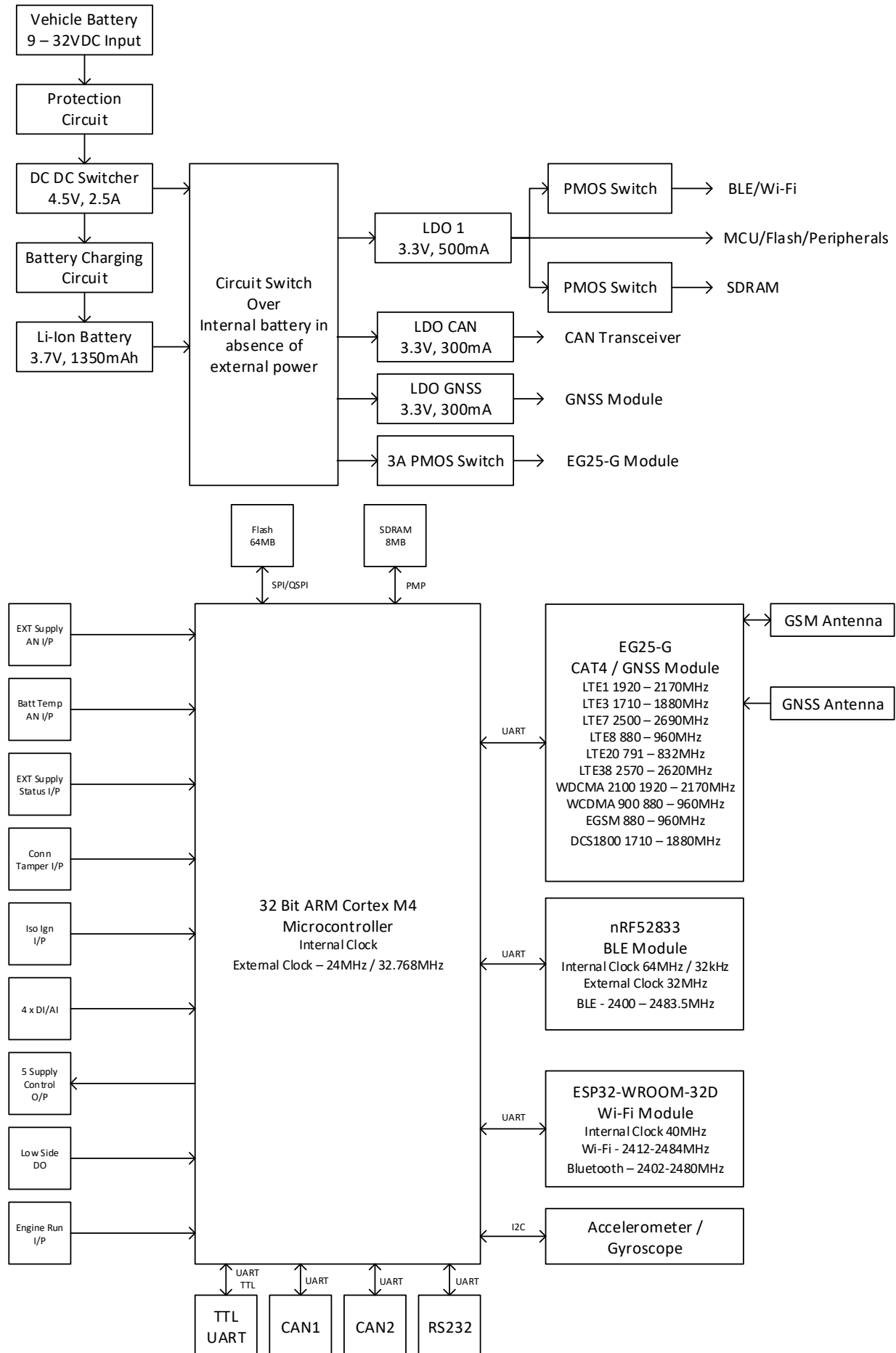
The LiveLink 4 contains no user tuneable or serviceable parts. Service of the LiveLink 4 should only be carried out by authorized personnel.

Technical queries should be directed to Microlise as the manufacturer at the address below:

Microlise Ltd
Farrington Way
Eastwood
NG16 3AG
United Kingdom

www.microlise.com

Block Diagram



Technical Specification

Item	Specification
Power Supply:	9 – 32 V dc, or internal 3.7V Li-ion battery
Current Consumption:	1A Max, <2mA average in sleep mode
Supported interfaces:	RS232 x 1 Engine run Ignition Isolated ignition Analog / digital inputs x 4 CAN bus interface x 2 BLE Accelerometer 3V nano SIM card interface
GSM/UMTS/LTE Bands Supported:	LTE 1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 19, 20, 25, 26, 28, 38, 39, 40, 41 UMTS 1, 2, 4, 5, 6, 8, 19 GSM 850, 900, 1800, 1900
GPRS:	703 – 2690MHz
Frequency:	See Cellular RF Power Output Table
Max Power Output:	
Internal GSM Antenna Model:	Taoglas PCS.06.F
Frequencies:	698 – 960MHz, 1710 – 2690MHz
Peak Gain:	3.72dBi (2500 – 29690MHz)
GNSS Receiver:	Supports GPS, GLONASS, BeiDou, Galileo
Internal GPS Antenna Model:	Abracon GPS + GLONASS Patch Antenna
BLE Class:	5.1
Frequencies:	2400 – 2483.5MHz
Power Output:	8dBm Max
Wi-Fi Protocol:	2.4GHz 802.11b/g/n
Frequencies:	2400 – 2483.5MHz
Power Output:	+20dBm (802.11b)
Bluetooth Class:	5.1
Frequencies:	2402 – 2480MHz
Power Output:	+8.61dBm
Mechanical Dimensions:	180mm x 40mm x 115mm
Weight:	400g
Environmental Operating Temperature:	-20°C - +70°C
Storage Temperature:	-40°C - +85°C
IP rating:	IP69K

1.1 Cellular RF Power Output

Technology	Band	Max Output Power	TX Freq
LTE	1	25dBm	1920 - 1980
LTE	2	25dBm	1850 - 1910
LTE	3	25dBm	1710 - 1785
LTE	4	25dBm	1710 - 1755
LTE	5	25dBm	824 - 849
LTE	7	25dBm	2500 - 2570
LTE	8	25dBm	880 - 915
LTE	12	25dBm	699 - 716
LTE	13	25dBm	777 - 787
LTE	18	25dBm	815 - 830
LTE	19	25dBm	830 - 845
LTE	20	25dBm	832 - 862
LTE	25	25dBm	1850 - 1915
LTE	26	25dBm	814 - 849
LTE	28	25dBm	703 - 748
LTE	38	25dBm	2570 - 2620
LTE	39	25dBm	1880 - 1920
LTE	40	25dBm	2400 - 2400
LTE	41	25dBm	2496 - 2690
UMTS	1	25dBm	1920 - 1980
UMTS	2	25dBm	1850 - 1910
UMTS	4	25dBm	1710 - 1755
UMTS	5	25dBm	824 - 849
UMTS	6	25dBm	830 - 840
UMTS	8	25dBm	880 - 915
UMTS	19	25dBm	830 - 845
GSM	850	35dBm	824 - 849
GSM	900	35dBm	880 - 915
GSM	1800	35dBm	1710 - 1785

Regulatory and Type Approvals

1.1 CE

EU DECLARATION OF CONFORMITY

We,

Microlise Ltd

Of: Farrington Way, Eastwood, Nottingham, NG16 3AG, United Kingdom

Declare that the declaration is issued under our sole responsibility and belongs to the following product:

Product: LiveLink 4

Type: 728/J8518

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Radio Equipment Directive 2014/53/EU

Restriction on Hazardous Substances 2011/65/EU

The following harmonised standards or technical specifications have been applied:

Radio Equipment Directive 2014/53/EU

Health (Article 3.1(a)):

EN62311:2020

Safety (Article 3.1(a)):

EN62368-1:2014

EMC (Article 3.1(b)):

EN 301 489-1 V2.2.3 (2019-11)

EN 301 489-17 V3.2.2 (2017-12)

EN 301 489-19 V2.1.1 (2019-04)

EN 301 489-52 V1.1.0 (2016-11)

Spectrum (Article 3.2):

EN 300 328 V2.2.2 (2019-07)

EN 301 511-13 V12.5.1 (2017-03)

EN 301 908-2 V11.1.2 (2017-08)

EN 301 908-13 V11.1.2 (2017-07)

EN 303 413 V1.1.1 (2017-06)

Notified Body: Element Material Technologies

4 Digit Notified Body Number: 0981

Reference Number of Certificate: ENW20RED1075

Intervention of Notified Body: EU-Type Examination for Article 3.2

Signed for and on behalf of:



Ian Dickinson, Director of Hardware Development
Microlise Ltd, 12 January 2021

1.2 E-Mark

Product	E-Mark Status
LiveLink 4	E Marked – E11 10R-05 11336 A copy of the product approval certificate is available on request.

1.3 Global Approvals

1.3.1 Canada (ISED)

IC ID: 21450-LL4

Contains Espressif ESP32-WROOM-32D IC ID: 21098-ESPWROOM32D

Contains Quectel EG25-G IC ID: 10224A-201903EG25G

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

1.3.2 United States (FCC)

FCC ID: OUU-LL4

Contains Espressif ESP32-WROOM-32D FCC ID: 2AC7Z-ESPWROOM32D

Contains Quectel EG25-G FCC ID: XMR201903EG25G

FCC warning statement:

- This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

Issue History

Issue	Author	Date	Change Details
1.0	J Marley	20/01/21	Initial Version