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ACU6 Lite Machines User Manual - 105560001	ACTIA Group	U - Uncontrolled	1.2	1.3 Released

ACU6 LITE MACHINES USER MANUAL - 105560001



Revision history

Revision	Date	Author(s)	Cause of changes	Updates
1.0	2020-08-10	S. Alazawi		First version - Draft
1.1	2023-03-07	S. Alazawi		GSM 900 removed
1.2	2023-04-03	S. Alazawi		Corrected safety distance
1.3	2023-04-04	S. Alazawi		Added warning text for ISED

Contents

Revision history	2
1 Product description	4
1.1 General	4
1.2 Connectors.....	4
1.3 SIM.....	4
1.4 Power supply	4
1.4.1 External supply	4
1.4.2 Backup battery.....	4
1.5 Temperature range.....	4
2 RF description	5
2.1 General	5
2.2 Cellular	5
2.2.1 Bands and output power	5
2.3 Bluetooth.....	5
2.4 GNSS	6
3 Functional Description.....	7
3.1 CAN connection	7
3.2 Positioning information	7



4	Installation and maintenance.....	8
4.1	Installation.....	8
4.2	Cable harness	8
4.3	Safety Distance	8
4.4	Maintenance.....	8

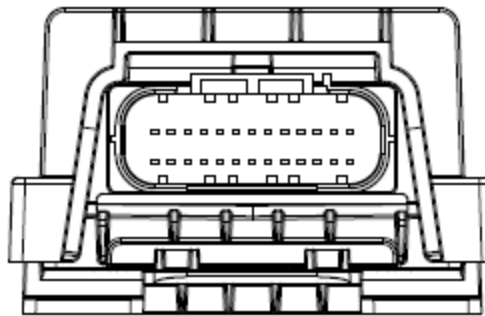
1 PRODUCT DESCRIPTION

1.1 GENERAL

105560001 is a telematics product for off highway applications. It will be factory fitted in the machinery. Different external interfaces are used for wired communication. It has an embedded cellular LTE modem and Bluetooth Low Energy transceiver. Positioning is made with an GNSS receiver.

There is also an internal backup battery that is used if the external power source is lost.

1.2 CONNECTORS



1. 26-pin JEA

Main connector

1.3 SIM

The product has an internal eSIM that is soldered to the PCB.

1.4 POWER SUPPLY

1.4.1 External supply

Operating voltage range: 9-16 V. Nominal 14.2 V

1.4.2 Backup battery

105560001 can also be operated without external power source using an internal rechargeable battery pack. In this mode some functionality is disabled.

1.5 TEMPERATURE RANGE

Operating temperature range: -40 to +75 C

2 RF DESCRIPTION

2.1 GENERAL

105560001 supports different radio technologies:

- Cellular
- Bluetooth (BLE)
- GNSS

When the product is in normal operation mode and powered by external power source all technologies can be activated. When powered by the internal backup battery only cellular and GNSS can be activated.

2.2 CELLULAR

105560001 uses an embedded CAT M & NB LTE modem.

2.2.1 Bands and output power

Technology	Bands	Max. ouput power
GSM/GPRS/EDGE	850/1800/1900	Class 4 (+33dBm $\pm$ 2dB) EGSM850 Class 1 (+30dBm $\pm$ 2dB) for GSM1800 & GSM1900 Class E2 (+27dBm $\pm$ 3dB) for GSM 850 Class E2 (+26dBm +3 /-4dB) for GSM 1800 & GSM 1900 8-PSK
LTE CAT M1	Bd12, Bd13, Bd28, Bd85 (700), Bd18, Bd19, Bd20, Bd26, Bd27 (800), Bd5 (850), Bd8 (900), Bd66 (AWS-3), Bd4 (AWS-1), Bd3 (1800). Bd2 & b25 (1900), Bd1 (2100)	Class 5 (+20dBm $\pm$ 2dB)
LTE NB1/2	Bd71 (600), Bd12, Bd13, Bd28, Bd85 (700), Bd18, Bd19, Bd20, Bd26 (800), Bd5 (850), Bd8 (900), Bd66 (AWS-3), Bd4 (AWS-1), Bd3 (1800). Bd2 & b25 (1900), Bd1 (2100)	Class 5 (+20dBm $\pm$ 2dB)

2.3 BLUETOOTH

Bluetooth Low Energy (BLE) is supported.

Output power class 1.

2.4 GNSS

System	Band
GPS	L1
GLONASS	L1 FDMA
Galileo	L1
Beidou	B1

3 FUNCTIONAL DESCRIPTION

3.1 CAN CONNECTION

105560001 has a CAN interface for connection to CAN buss vehicles. CAN data can be sent and received.

3.2 POSITIONING INFORMATION

The product can send GNSS position data on the CAN bus. The GNSS data can be used by other ECUs in the vehicle, for instance the navigation system.

4 INSTALLATION AND MAINTENANCE

4.1 INSTALLATION

The product is factory fitted in vehicles. It is not possible to buy this product separately.

4.2 CABLE HARNESS

Wire insulation and tubing in cable harness shall comply with IEC 60332-1-2, IEC 60332-1-3, IEC 60332-2-2 or IEC/TS 60695-11-21.

4.3 SAFETY DISTANCE

Minimum safety distance for the device and the internal transmitting antennas is 7.5 cm.

4.4 MAINTENANCE

The status of the product can be read via diagnostic connections using special workshop tools. In addition, other ECUs monitor the communication from the product and in case of missing/invalid communication, the Central Electronic Module in the vehicle is alerted, and will display a warning to the driver.

Maintenance and replacement of the product can only be performed by certified workshops.

5 REGULATORY CERTIFICATIONS

5.1 USA (FCC)

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.

5.1.1 FCC Warnings and Notices

WARNING: The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by ACTIA Nordic AB could void the user's authority to operate the equipment.

RF EXPOSURE WARNING: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 7.5 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

5.1.2 OEM Requirements

Following text should be printed in the user manual for vehicles in US:

Type Approval USA

FCC ID: 2AGKK105560001

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.

WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTICE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

5.2 CANADA (ISED)

5.2.1 ISED Warnings and Notices

This device is compliant with the Radio-Electrical Standards for Radio Devices for Canadian Industry exempt from license. Operation is permitted under the following two conditions: (1) the device shall not produce any interference, and (2) the user of the device must accept any received radio-electrical interference, even if the interference is likely to compromise its operation.

This radio transmitter 20839-105560001 has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

WARNING: The ISED requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Actia Nordic AB could void the user's authority to operate the equipment.

RF EXPOSURE WARNING: This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 7.5 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Le présent émetteur radio 20839-103360002 a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

AVERTISSEMENT : L'ISED exige que l'utilisateur soit informé que tout changement ou modification apporté à cet appareil qui n'est pas expressément approuvé par Actia Nordic AB pourrait annuler l'autorité de l'utilisateur à utiliser l'équipement.

AVERTISSEMENT D'EXPOSITION RF : Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 7,5 cm entre le radiateur et votre corps. Cet émetteur ne doit pas être co-localisé ou fonctionner en conjonction avec une autre antenne ou un autre émetteur.

5.2.2 OEM Requirements

Following text should be printed in the user manual for vehicles in Canada:

Type Approval Canada

IC: 20839-105560001

This device contains license-exempt transmitters/receivers that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS standard(s)]. 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.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.