CL10 User Manual

Part Number: 1033349-01

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Foreword

The CL10 adds cellular and Wi-Fi capability to the X-Family consoles. It allows access to the new Topcon Agriculture Platform (TAP), which is a cloud based integrated agronomic management platform. It also provides access to the XTEND feature in the Horizon console operating system.

General Information

Description

The CLOUDLYNK 10 is proposed as a USB-powered plug and play box hosted by a remote, LINUX based, processor. It will provide 3G/LTE global, WiFi 802/11 b,g,n and BLE 4.2 communication capability to the host processor, along with a multimode positioning system (a-GPS and telephone cell geo-referencing) and an hardware based, highly secure encryption engine. Furthermore 2 high speed USB ports will be made available to the user.

CL10 variants

The CL10 is available in different hardware versions with different MODEM characteristics:

- CL-10 3G
- CL-10 LTE EU
- CL-10 LTE JAP
- CL-10 LTE AUS
- CL-10 LTE VZW

Hardware

Mechanical characteristics

The Mechanical components of CLOUDLYNK 10 are:

- Back housing / aluminum carrier
- Plastic front cover with integrated LED-windows
- Mainboard
- Antennas (external & internal)
- Supporting parts (gasket, screws, M8-harness, venting membrane, Label, …)

Accessories:

- USB connecting cable M8 to USB-Type A

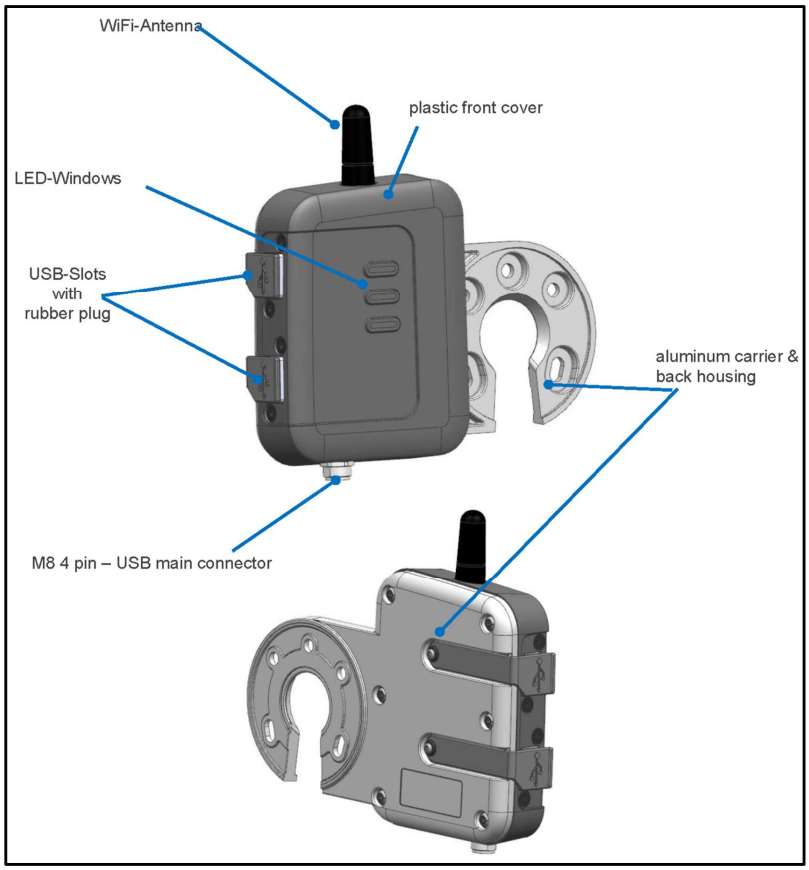

Figure 1

Figure 2

Figure 3

Cover characteristics

Back housing / aluminum carrier

- Aluminum die cast
- Supporting the venting membrane and the label field
- Powder coating with structure, semi gloss, RAL 9006

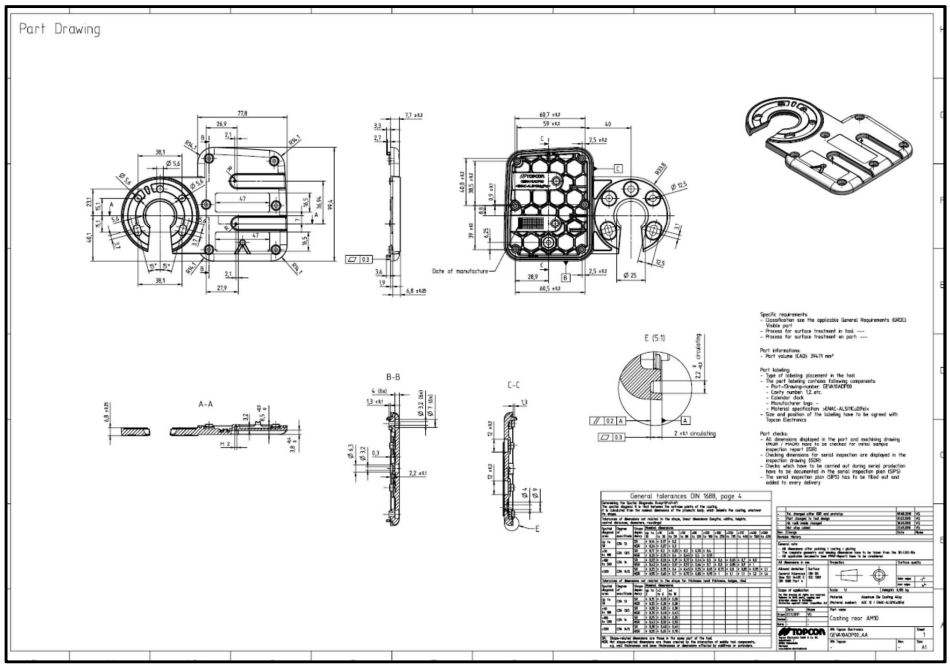

Figure 4

Plastic Front Cover

- Plastic molded part, visible surfaces etched & polished, no painting
- 3 overmolded or assembled LED windows
- Supporting the mainboard with 2 sealed Amphenol USB-Type A slots with related rubber plugs
- Supporting the internal antennas (self sticking)
- Supporting the external WiFi-Antenna
- Supporting the M8-USB Main connector
- Plastic material color 9005, black

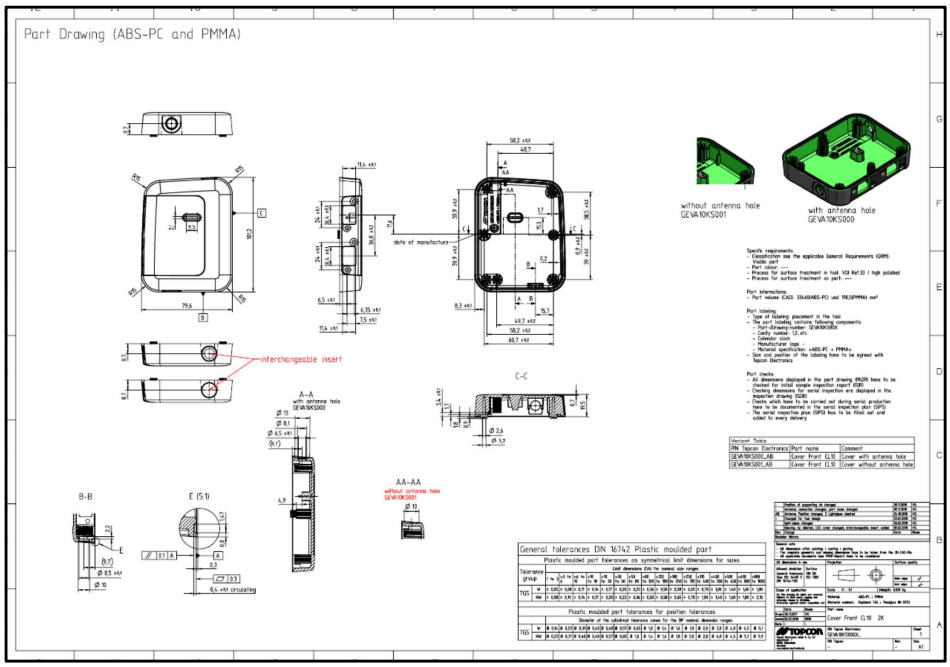

Figure 5

Mass

The CLOUDLYNK 10 total mass is 0,15 kg max including the USB connection cable/plug and the USB ports sealing caps.

Mechanical dimensions

The CLOUDLYNK 10 box board can be contained into a prism having the following dimensions: 122,3 x 82,7 x 26,5 mm.

The length of the harness connection cable is 350 mm including the plug. The 2 USB ports rubber protection caps are considered pugged.

Technical Specifications

Thermal characteristics

Operating temperature

The CLOUDLYNK 10 will be able to operate in accordance with the specification while exposed to a still air environment at a temperature range of -25 °C < Top < +65 °C.

Storage temperature

The CLOUDLYNK 10, not connected to the host device, will withstand an indefinite storage period in an environment at a temperature range of -40° C < Ts < +85 °C.

Altitude

The CLOUDLYNK 10 will meet the specification requirements if kept to an altitude up to 2500 m a.s.l.

Humidity

The CLOUDLYNK 10 will be able to operate in accordance with the specification while kept in an ambient of RH included in the range 5% - 85% non-condensing.

A proper moisture coating could protect the CLOUDLINK 10 PCB; the type and extent of the coating, if any, will be defined after the prototype test.

General environmental characteristics

Protection degree

The CLOUDLYNK 10, properly installed and connected, will meet the IP65 protection level. The M8 on CLOUDLYNK 10 side is specified with IP65 so in combination with appropriate host connector this connection is sealed to IP65 (e.g. X25/X35)

If CLOUDLYNK 10 will work properly also in case of water drops or dust contamination (IP66 protection level), a proper PCB coating will be implemented.

Chemicals

The CLOUDLYNK 10 will meet the chemical exposure requirements specified in the Test Plan specification, either in terms of atmosphere and fluids.

Weather and ageing

The CLOUDLYNK 10 will meet the requirements specified in the Test Plan specification in terms of weather exposure and ageing.

Vibration and shock

The CLOUDLYNK 10, properly mounted and connected, will be able to operate in accordance with the specification while exposed to a 10 – 300 Hz 50 m/s2 24 hours 1 octave/min along each geometrical axis.

Special care must be taken to protect the connection cable and the USB plug from vibration field. The CLOUDLYNK 10 will survive the application of 3 impulses 300 m/s2 11mS along each geometrical axis.

Electrical characteristics

Electrical architecture

The table 1 lists the CLOUDLYNK 10 functional blocks.

The table 2 shows the microprocessor block diagram.

OP Mode	Mode Characteristics	Current Consumption
Modem (**3G** version)	**SARA-U201(U-Blox)** Global coverage **Approvals:** RED GCF CE FCC PTCRB Anatel(Brazil) AT&T and other local approvals & provider certifications RCM(Australia) CCC (China) •	**Bands:** Five Bands UMTS (WCDMA/FDD) Bands: 800, 850, 900, 1900 and 2100 MHz Quad-Band GSM Bands: 850, 900, 1800 and 1900 MHz 3GPP Rel.7 Compliant Protocol Stack **Data speed:** HSDPA Cat.8 / HSUPA Cat.6 data rates DL: max. 7.2 Mbps, UL: max. 5.76 Mbps EDGE Class 12 data rates DL: max. 237 kbps, UL: max. 237 kbps GPRS Class 12 data rates DL: max. 85.6 kbps, UL: max. 85.6 kbps
Modem (**LTE Cat 1**)	**LARA-R204-Verizon(U-Blox)** **Local coverage: US** **Approvals:** FCC GCF ISED Verizon certification RoHS	LTE (FDD) 3GPP Rel.9 Compliant **Bands:** Bands 4,13 (1700 AWS, 700 MHz) **Data speed:** LTE Cat. 1 single layer DL-MIMO DL/UL max: 10.3Mbps / 5.2 Mbps

OP Mode	Mode Characteristics	Current Consumption
Modem **(LTE Cat 1** Version)	**LARA-R2** Local coverage: EU, US, AUS,JAP **Approvals:** CE RED GCF PTCRB IC AT&T	LTE (FDD) 3GPP Rel.9 Compliant Protocol Stack, RX-Diversity **Bands** Quad-Band LTE: Bands 2, 4, 5, 12 (700, 850, 1700/2100 (AWS) and 1900 MHz) Tri-Band UMTS: Bands 5, 4, 2 (WCDMA/FDD 850, 1700/2100 (AWS) and 1900 MHz) **Data speed** LTE Cat.1 DL: max. 10.2 Mbps, UL: max. 5.2 Mbps HSPA+ Cat.8 (ELS61-US) data rates DL: max. 7.2 Mbps, UL: max. 5.76 Mbps GPRS Class 12 (ELS61-E) DL: max. 85.6 kbps, UL: max 85.6 kbps SMS text and PDU mode support
SIM	Global Coverage SIM on Chip (KPN) Verizon SIM on Chip for US	Lock on local provider possible
GPS	EVA – M8M(uBLOX)	72-channel u-blox M8 engine GPS/QZSS L1C/A, GLONASS L1OF, BeiDou B1l, Galileo E1B/C, SBAS L1C/A: WAAS, EGNOS, MSAS, GAGAN FA-GPS and SBAS compliant PPS available
BLE	**Bluemod+S42**	Generic GATT central with up to 3 parallel connections Terminal I/O peripheral RSSI compliant
WiFi	**LYLY-W132** (uBLOX) Approval for US (FCC), Canada (IC) and Japan (MIC)	802.11 b/g/n compliant Output frequency: 2,4 GHz Channels: 1 – 13 Station and micro access point operation (up to 8 clients) 802.11 PHY data rates up to 72 Mbps LTE coexistence BAW filter included
Processor	**STM32F070CBT6TR** (ST)	ARM Cortex M0 core (see below the STM32 family block diagram)
Flash memory	128 kBytes (TBR)	Embedded in the uP
RAM memory	16 kBytes (TBR)	Embedded in the uP

OP Mode	Mode Characteristics	Current Consumption
Data security H/W	Secure element **SE V1.3.1** (Gemalto-Cinterion) Asimmetric Crypto Engine	DES, 3DES (ECB, CBC), AES up to 256 bits RSA keys up to 2048 bits Elliptic curves support from 224 bits to 384 bits SHA-1, SHA-256, SHA-384 bits RSA according to ISO 9796-2 or PKCS#1 v2.1 (PSS-OAEP) On Board Key Generation Updatable cryptographic profile True RNG (random number generator) according to AIS31
USB Hub (note 1)	**USB2517** (Microchip)	1 upstream to 7 downstream USB Hub 2 User available downstream ports Full Speed compliant (480 Mb/s) Port Speed autodetect capability
Power supply	5 Vdc from USB upstream port.	500 mA max

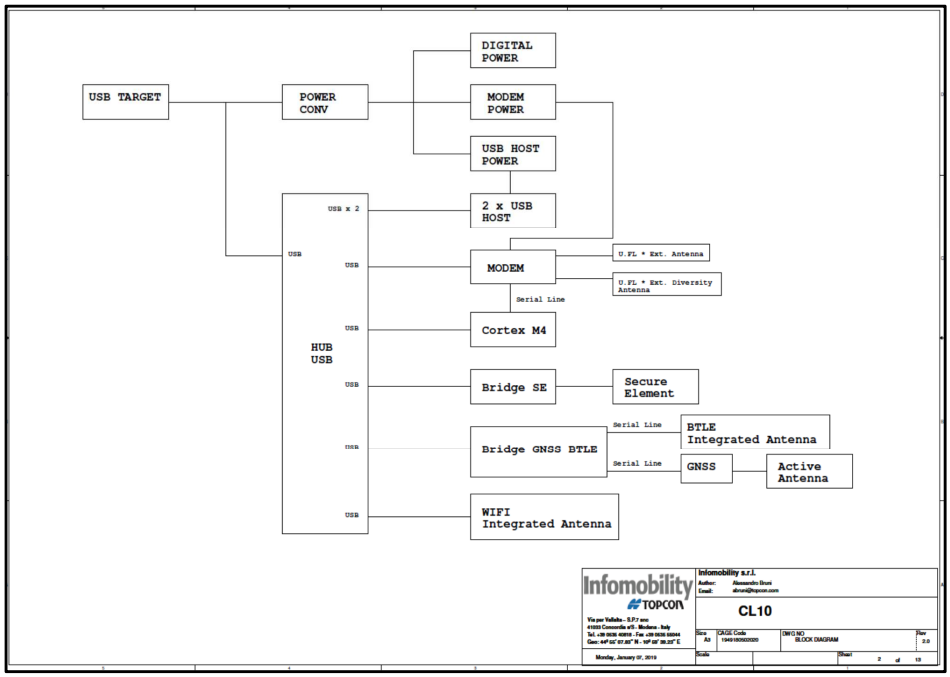

TABLE 1 – Functional blocks

Note: Due to limited power availability from the upstream port, the USB user available downstream ports power lines DOES NOT COMPLY with USB standards in terms of current availability.

TABLE 2 - Processor block diagram

Supply voltage

The CLOUDLYNK 10, properly connected, will be able to operate in accordance with the specification when the supply voltage will be in the range of 4,5 – 5,5 Vdc.

The nominal supply voltage will be 5,0 Vdc (USB standard)

Being all USB connectors intrinsically polarized, the power lines are not protected against the polarity inversion.

Installation – setup

CL10 installation

With mounting arm for RAM

1. Remove the nuts from the RAM mount.
2. Place the CL10 arm over the RAM mount, align with the screws and replace the nuts.
3. Plug the CL10 into the USB port on the rear of the console.

User interface

LED status

The LEDs on the CL10 are currently not used.

Product Warranty

ELECTRONIC COMPONENTS -TPA warrants that the electronic components manufactured by TPA shall be free of defects in materials and workmanship for a period of two years from the original date of shipment to the dealer.

Use restrictions and warnings (FCC / ISED)

Commentato [MDA1]: Inserire tutto il capitolo

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

2.Device model CL-10 3G:

CONTAINS FCC ID: 2ASVE-CL10 IC: 24901-CL10

CONTAINS: FCC ID: XPY1CGM5NNN IC: 8595A-1CGM5NNN

CONTAINS: FCC ID: RFRMS42 IC:4957A-MS42

Device model CL-10 LTE VZW:

CONTAINS FCC ID: 2ASVE-CL10 IC: 24901-CL10

CONTAINS: FCC ID: XPY1EIQN2NN IC: 8595A-1EIQN2NN

CONTAINS: FCC ID: RFRMS42 IC:4957A-MS42

3.Responsible party's contact located in the United States:

FERDINAND RIODIQUE
7400 NATIONAL DRIVE, LIVERMORE, CA, USA 94550
Phone no: 925-245-8516
Email address: friodique@topcon.com

4.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. 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.

6. Responsible party's contact located in the Canada:

STEPHEN ROSENEGGER
106-7326-10th Street N.E., Calgary, AB T2E8W1 Canada
Phone no: +1.403.450.4262
Email address: srosenegger@topcon.com

7. This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'emetteur/recepteur exempt de licence contenu dans le present appareil est conforme aux CNR d'Innovation, Sciences et Developpement economique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisee aux deux conditions suivantes : (1) L'appareil ne doit pas produire de brouillage; (2) L'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

8. ICES-003 Class B Notice -Avis NMB-003 Classe B :

This Class B digital device complies with Canadian ICES-003

Cet appareil numerique classe B est conforme à la norme Canadien NMB-003.

CAN ICES-3(B) /NMB-3(B)

RF Radiation Exposure statement

Commentato [MDA2]: Inserire tutto il capitolo

This product complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body.

Cet appareil est conforme aux limites d'exposition aux rayonnements de l'ISED pour un environnement non contrôlé. L'antenne doit être installé de façon à garder une distance minimale de 20 centimètres entre la source de rayonnements et votre corps.