Titel	Reg. Nr.	Date	Author	Revision
Installation Manual MCG TQ377	TQ-18-496	2019-05-29	Erik Ljung	p1k

Mobile Communication Gateway

Installation Manual

MCG TQ377

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General Description

This document is the installation manual for MCG TQ377

Document revision

Date	Rev	Content	Author
2018-11-14	p1a	Started writing	Erik Ljung
2018-11-22	p1b	Edited	Erik Ljung
2019-02-12	p1c	Edited after review by Dan B	Erik Ljung
2019-02-13	p1d	Changed picture for antenna pattern	Erik Ljung
2019-03-20	p1e	Changed MCG picture	Erik Ljung
2019-04-18	p1f	Added FCC statements	Erik Ljung
2019-04-25	p1g	Added distance in FCC statement	Erik Ljung
2019-05-09	p1h	Added info on do not mount close to antennas	Erik Ljung
2019-05-22	p1i	Added FCC ID and IC	Erik Ljung

2019-05-28	p1j	Added screw force	Erik Ljung
2019-05-29	p1k	Changed FCC range to human body to 20cm, and added WiFi/BT antenna pattern 2430MHz	Erik Ljung

Delivery content

Please check that the delivery includes the following:

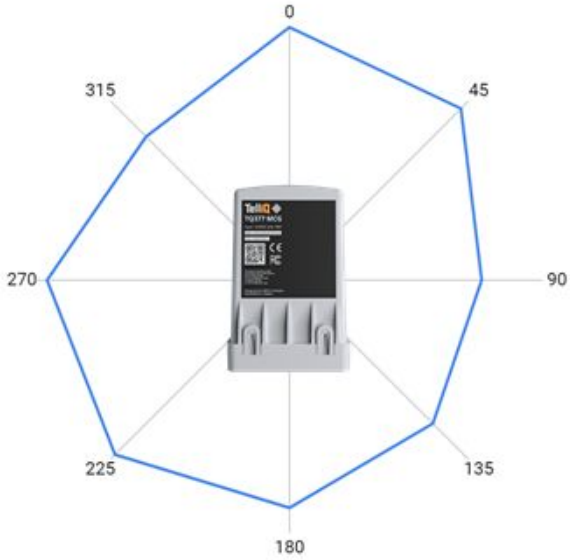
- Mobile Communication Gateway, TQ377
- Power cable
- Fuse holder
- 3A fuse
- CAN cable

Optional equipment

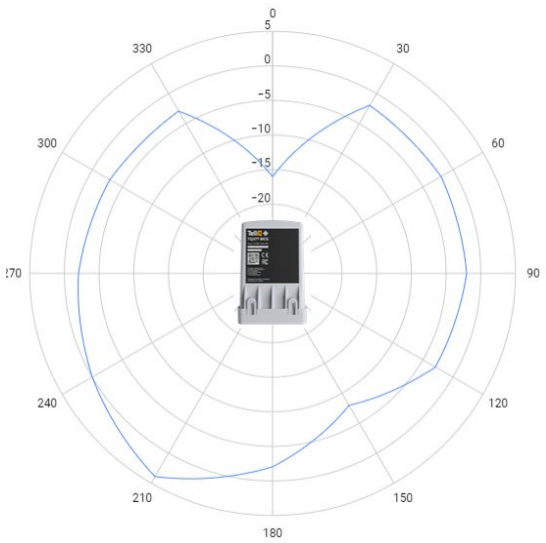
- Four M4 screws
- One M5 screw
- Cable Ties
- Ethernet cable
- Magnetic fixation kit
- Fixation plate

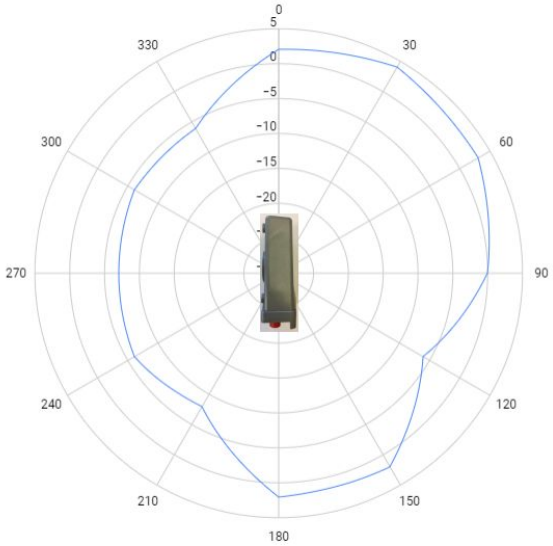
Mounting the unit

Mount the unit on a suitable location as an antenna with a clear view to the sky for communication and navigation. The unit shall be mounted flat horizontal. The unit shall not be mounted close to other antennas, if closer than 500mm than a radio evaluation needs to be done. Example on antenna pattern from above for cellular communication at 900MHz is given in the figure below.



Example on antenna pattern from above for WiFi/Bluetooth communication at 2430MHz is given in the figures below.





If the unit is to be connected to CAN-BUS, place the unit as close as possible to connection point. Mount the unit where the temperature is lower than 60℃.
Drill one 5,5mm hole at the machine and screw the unit using one screw to the machine, use a force of 3Nm (max 3,6Nm).

If the four holes shall be used for mounting, drill four 4,5mm hole at size 58*90mm and use M4 screws to secure the unit on the machine, use a force of 2Nm (max 3,6Nm).

If the optional magnetic kit is used, screw these four magnets to the unit and snap the unit on to the machine at a suitable place.

If the optional fixation plate is used, screw that to the unit and screw the plate (and unit) to the machine.
Strap the cables on the machine to where they shall be connected.

Electrical installation

X1 X2 X3

X1 MCG Power Connector and cable

The MCG Power Connector is an M12 standard male A-coded.
The attached cable is a straight connector M12 standard female A-coded cable with free ends.
Note! Some functions are critical for the unit to work properly and shall always be connected.
The MCG Power Cable is connected with the following signals and colors:

Signal	PIN	Color	Description
UIN 10-36 VDC	1	BROWN	Connect to battery + (positive) before main power switch via a 3A fuse
IO1 – Ignition	2	WHITE	Connect to ignition signal on machine. Ignition must be turned on to wake up the unit from sleep mode
A GND	3	BLUE	Connected to battery – (negative) before main power switch
IO2	4	BLACK	Connect IO2 signal Digital signal or analogue signal (0-30VDC) or pulse signal
IO3	5	GRAY or YELLOW/ GREEN	Connect IO3 signal Digital signal or analogue signal (0-30VDC/0-5VDC) or pulse signal

Note! At least the three wires in MCG X1 pin 1-3 Power cable needs to be connected for full functionality.

X2 MCG CAN connector

The MCG CAN Connector is an M12 standard female A-coded with interconnections according to the CANopen standard.
The attached cable is a straight connector M12 standard male A-coded CAN cable with free ends.
Note! All shields shall be connected on the machine side (GND).
The MCG:CAN cable shall if connected as a stub (Drop Cable) not be longer than 1 meter. If the CAN cable is connected as a bus extender with termination (external or internal) it can be longer. It shall be connected with the following signals and colors:

Signal	PIN	Color	Description
Shield	1	Shield	Connect to GND on machine
Connected to sensor power (max 100mA)	2	RED	Is controllable sensor output voltage (Uin-1V)
CAN1 GND	3	BLACK	Connect to CAN GND
CAN1 High	4	WHITE	Connect to CAN High
CAN1 Low	5	BLUE or BROWN	Connect to CAN Low

X3 MCG Ethernet connector

The MCG:Ethernet connector is a D-Coded female M12 connector with MDI/MDIX so a crossed or straight cable to the other Ethernet unit (example switch) can be used.
The connector interconnection is according to profinet standard.

Signal	PIN	Description
TX+	1	Yellow
RX+	2	White
TX-	3	Orange
RX-	4	Blue

Commissioning

The machine should be outside for optimal GNSS reception and where GSM/4G coverage is adequate.

Turn on the ignition and engine for up to five minutes to active the unit for the first time. Then contact your account manager or technical contact for functional control and administration of the unit in the TelliQ Back Office.

TelliQ Support is available 08.00-17.00 CET on telephone no.: +46 589 123 70 or email: support@telliq.com

LED functionality

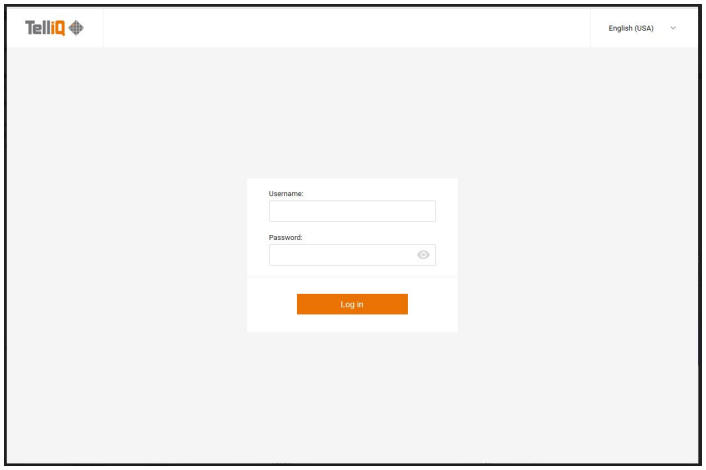
The green status LED on the MCG can be used to monitor the basic MCG status. The status LED have the following functionalities:

1. No LED lit = No power to the unit or the unit in power save mode.
2. Green LED lit = Got power to the unit (or waking up from power save) will be on for some seconds
3. Green LED flashing (0,5Hz) = Normal operation
4. Green LED quick flashes (4Hz) = unit is not working as supposed

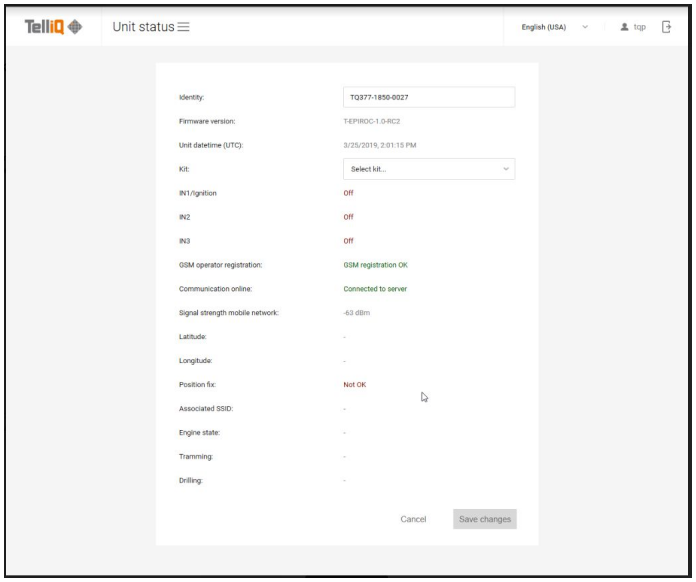
The standard functionality after starting a unit is that it is doing 1 to 3. For more information or if quick flashes arise, please login using the smartphone.

CADI functionality for commissioning and diagnostics of the MCG and its interfaces

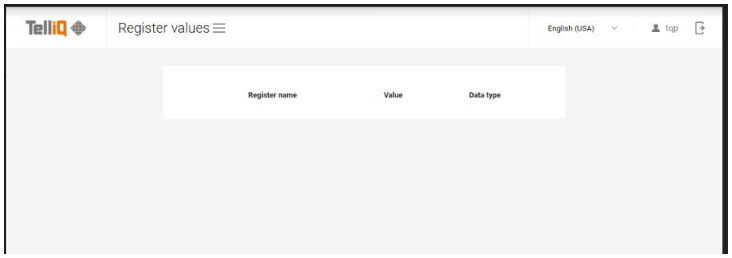
The Commissioning And Diagnostics Interface (“CADI”) can be accessed by any web browser, when attached to the access-point with the same SSID as the SN of the MCG unit.
The key for the network is entered.
Surf to: HTTPS://MCG.TELLIQ.COM
Type the user name and the password.



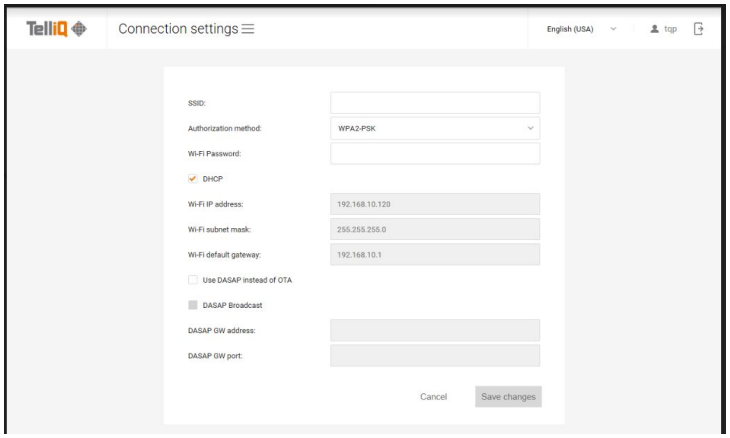
Unit status gives information on the status of the MCG and it is possible to set the Kit type (Machine type) from this view.



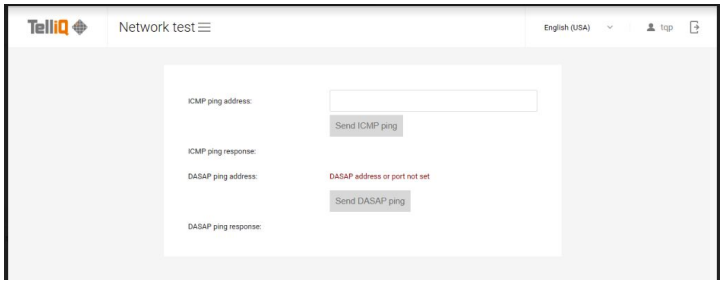
Register Values view gives information on the latest register values, internally in/from the MCG or from the interfaces from the machine (example control system or CAN system data)



Connection settings are settings for the WiFi network



Network test gives information on TBD



Support

If anything is missing from the delivery, or your appointed contact is unavailable please contact TelliQ Support on telephone no.: +46 589 123 70 or e-mail: support@telliq.com

FCC Statement

This unit has FCC ID: 2AS7RTQ377MCG
This device contains radio transmitter with certification to

- FCC ID: XF6-M15SB
- FCC ID: RI7ME910C1WW
- IC: 8407A-M15SB
- IC: 5131A-ME910C1WW

Part 15.19 NOTICE:
This device complies with Part 15 of the FCC Rules and with Industry Canada 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.

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'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Part 15.21 NOTICE:
Changes or modifications made to this equipment not expressly approved by (manufacturer name) may void the FCC authorization to operate this equipment.

Part 15.105 NOTE:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RF Exposure Information according 2.1091 / 2.1093 / KDB 447498 / RSS-102
Radiofrequency radiation exposure Information:
This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of [20] cm between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de [20] cm de distance entre la source de rayonnement et votre corps.
Ce transmetteur ne doit pas etre place au meme endroit ou utilise simultanement avec un autre transmetteur ou antenne.