User Manual C-Compact

FCC Part 15 complient notice for product variant 62 (North America)

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.

Changes or modifications not expressly approved by Convadis AG could void the user's authority to operate the equipment.

Note: 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.

To comply with FCC RF exposure compliance requirements for an uncontrolled environment, «C-Compact» main unit must be installed to provide a separation distance of at least 20 cm from all persons.

This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

INDUSTRY CANADA (IC) complient notice for product variant 62 (North America)

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:

- This device may not cause interference.
- This device must accept any interference, including interference that may cause undesired operation of the device.

To comply with ISED Canada RF exposure compliance requirements for an uncontrolled environment, C-Compact main unit must be installed to provide a separation distance of at least 20 cm from all persons.

To comply with the Canadian RF exposure compliance requirements, this device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

Pour se conformer aux exigences d'ISED Canada en matière d'exposition aux radiofréquences dans un environnement non contrôlé, la unité principale de "C-Compact" doit être installé de manière à assurer une distance de séparation d'au moins 20 cm par rapport à toutes les personnes.

Pour se conformer aux exigences de conformité RF canadienne l'exposition, cet appareil et son antenne ne doivent pas être co-localisés ou fonctionnant en conjonction avec une autre antenne ou transmetteur.

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:

- *L'appareil ne doit pas produire de brouillage.*
- *L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. Pour se conformer aux exigences d'ISED Canada en matière d'exposition aux radiofréquences dans un environnement non contrôlé.*

Description

C-Compact is a small car sharing /fleet management unit to be installed into a vehicle, scooter, truck or other road vehicle. It consists of only one unit, with the option to connect C-Intac, an external fuel/parking card/key fob reading antenna with 2 buttons.

The unit can exchange data to a booking system via our communication server CCom.

Features

- 32 bit ARM microcontroller
- 1MB Flash memory for program (main processor)
- 32 MB flash memory external and data memory (Logs, configuration, firmware imares).
- 64 kB EEPROM data memory (configuration, status info, trip data, reservation data)
- Cell phone module (LTE CAT 1):

  - Worldwide version LTE-M version: Sara R510S (Multi Region, FCC and ISED Canada certification pending)

- LTE-M: 1(2100 MHz), 2(1900 MHz), 3(1800 MHz), 4 (1700 MHz), 5(850 MHz), 8(900 MHz), 12(700 MHz), 13(750 MHz), 18(850 MHz), 19(850 MHz), 20(800 MHz), 25(1900 MHz), 26(850 MHz), 28(700 MHz)
    - FCC US: Band 2,4,5,12,13,25, 26
    - ISED CANADA: Band 2,4,5,12,13,25
- HW ready to assemble alternate cell phone modules
    o 2G/3G, 4G NB-IoT, 5G module from the same supplier.
- Integrated cell phone antenna
- GNSS module (GPS/GLONASS,GALILEO, BAIDU). A-GPS with integrated antenna.
- Bluetooth module (BLE 5) for communication with our smartphone app (C-App): Lock, unlock, reservation end, transmit reservation via smart phone (eg. for underground parking stations without cell phone coverage), dashboard view, configuration
- 2 Hi speed CAN bus interfaces
- 1 CAN-FD-Interface (Option)
- Inputs for odometer pulse reading, analog fuel reading, ignition detection, door feedback lines.
- Activator outputs for central lock systems: Wires to door lock switch and interior lock button, special connector for soldering/connecting the electronic circuit of the remote key of of the car.
- Activator outputs for immobilizer via a relay or via C-Port (see below).
- 3 axis Acceleration sensor for damage reporting and tampering alarms.
- LIN interface for external hardware extensions or for LIN data from vehicles.
- 3 color LED for user feedback.
- Integrated option (sub print): RFID card reader:
    o Integrated RFID antenna.
    o Readable RFID card types: 13.56 MHz: Mifare, ISO14443A, ISO14443B, ISO15693, Sony Felica.
    o Connector to external fuel/ parking card and RFID key fob reading unit (C-Intac).
- Push button: E.g. for starting synchronization/configuration process via smart phone (C-App)

Technical data:

- Input voltage range: 5.5-55V
- Temperature range:
    o Normal operationg range: -20 .. +65 ° celsius.
    o Extended operating range: -40 .. +85 ° celsius (RF perforence of Cell phone module reduced).
    o Notice: Temperature range of M2M SIM cards is SIM usually -25°C to 85°C, while more durable variants designed for industrial and automotive use can withstand temperatures ranging from -40°C to 105°
- Power consumption (12V input):
    o Operative: ca 100mA (4G registered).
    o Average in sleep mode: Currently ca. 20 mA (polling for 3 different RFID cards, 4G network, registered) This value might be reduced in in next 6 month (processor deep sleep mode not implemented yet)
- Dimensions: 116 x 79 x 24 mm.
- TCP Data consumption: See "Hardware description CBox Modulo"

Installation:
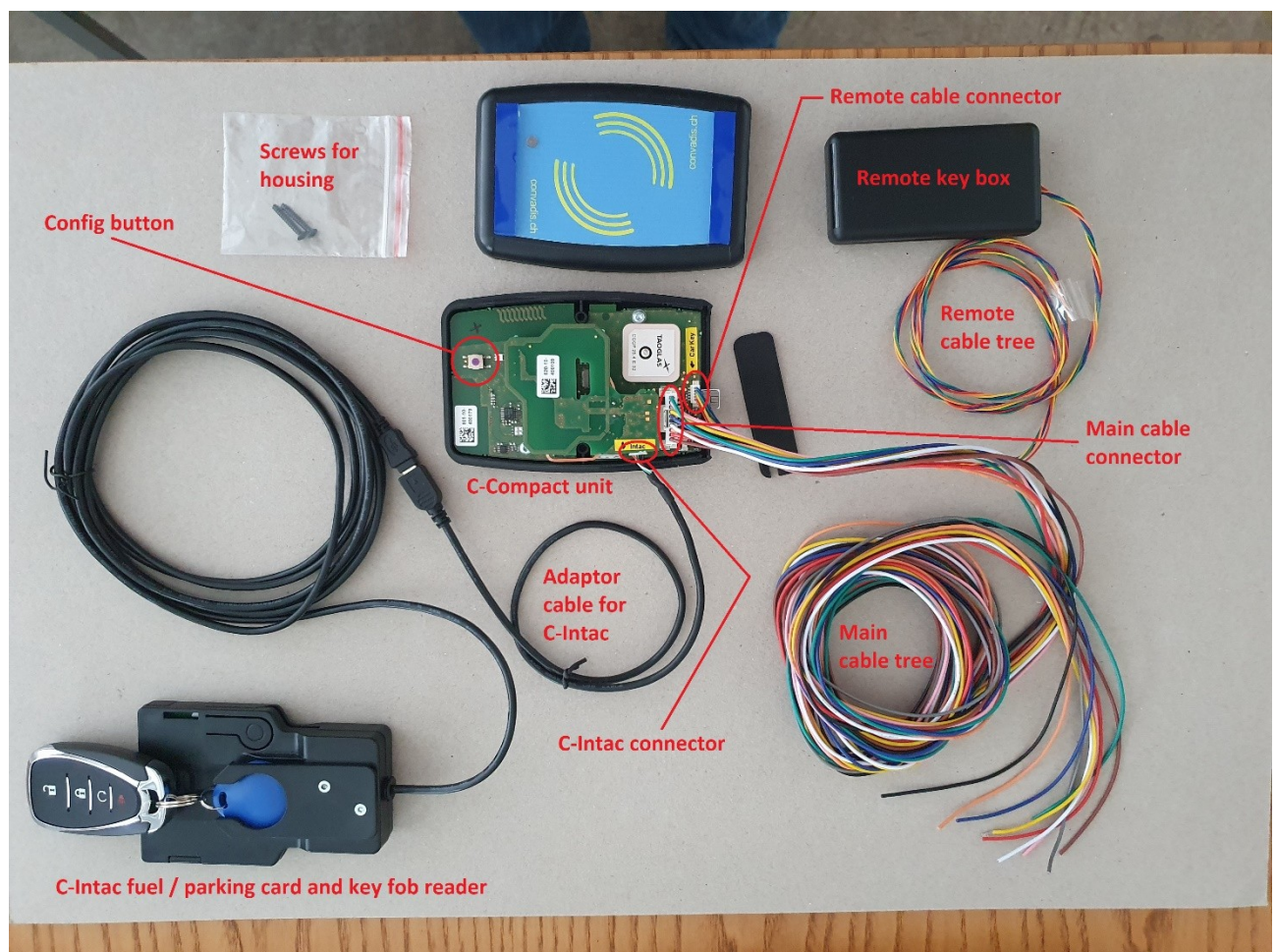
The unit includes a 10 pin conector with multiple hw configurable signal routing options and an additional connector for connectiong remote keys of the car (for lock/ unlock and for immobilizer function on cars with keyless start system).
For easy connecting to the vehicle harness (12V power and data) a connector to the On Board diagnostic connector or the vehicle (OBD) is avaialble. If the signals are readable from there and together with "C-Port" no other electric connection to the vehicle is needed.

C-Port includes an immobilizer option for for vehicle types with keyless go systems (start button instead of ignition lock switch), as well as for transponder immobilizer systems.

Inserting the SIM card, place and install the main unit and connect the cables:

The SIM card (Nano-SIM) is inserted under the main print. Before inserting, the device

must be disconnected from the power supply by unplugging the main plug. Press briefly at the little notch to remove the SIM.
After you have removed the housing cover by loosening the two black housing screws, the cables can be plugged into the edge of the device.
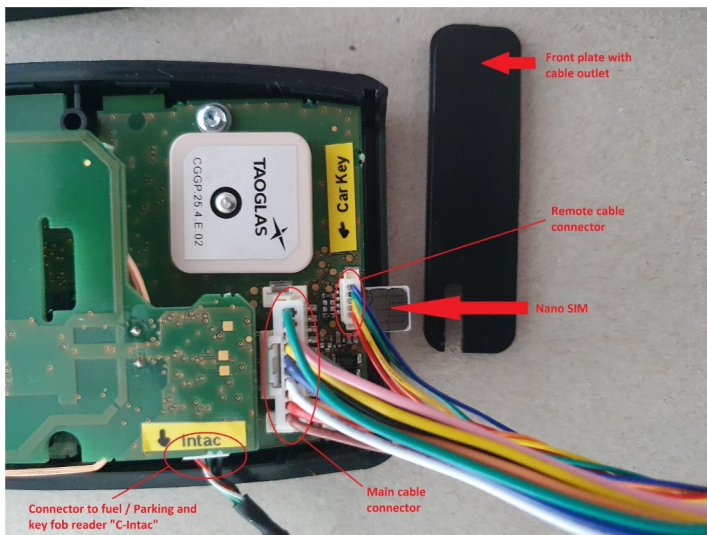
Attention: The cables for the central lock system and for the immobilizer can be configured as in- or outputs. To ensure that the central lock outputs in particular do not cause short circuits on the connected vehicle cables, please do not perform any log in/log out operations before synchronising the device with the CCOM server (see below). During synchronization, the correct vehicle-specific configuration is loaded.
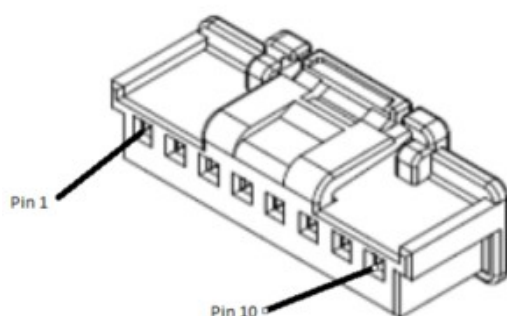
Vehicle connections:
Before connecting the cables, disconnect the battery!
Convadis provides instattation manuals for various vehicle models for registered customers on request. Als Convadis support for details (contact information see below). Usually our vehicle-specific installation instructions contain several connection variants (options). Select the appropriate installation variant, connect the cables accordingly, use the appropriate main wiring harness and configure the device accordingly.

Connect all required wires from the main connection tree to the specified connection point of the vehicle wiring according to the connection list in the vehicle-specific installation manual (see above). Please make sure that the connections are good, and the wires are fixed well and strain relief are secure.

Main cable three:

Pin	Color	Standard signal	Alternate signals
1	green	Immobilizer 2 output	• Analog fuel input • LIN bus • +3V out
2	pink	Analog fuel input	• Immobilizer 1 output • +3V out
3	grey	CAN1 Lo	• CAN FD Lo
4	yellow	*CAN1 Hi	• CAN FD Hi
5	blue	Odometer pulse input	• CAN2 Lo
6	black	Ignition on detect	• CAN2 hi
7	white	• Unlock (Separate lock/unlock, no feedback line) • Permanent feedback (common lock/unlock on Pin 8)	
8	orange	• Lock (Separate lock/unlock, no feedback line) • Pulse feedback (common	

		lock/unlock on Pin 7)	
9	red	Power Supply +	
10	brown	Ground	

Immobilizer:

Direct connection to «Immobilizer 2» wire of main OBS cable tree:
The immobilizer output «Immobilizer 2» (main cable tree Pin 1, green wire) contains a self protective FET to connect a wire to ground, e. g. the wire from the start button of a the car can be connected to ground via this wire. The OBS will switch the ground connection off in «logged out» state to immobilize the car then.

Breaking a wire via immobilizer relay:
Cut a dedicated wire of the vehicle harness to immobilize of the car (e.g. the wire to vehicle starter relay) and connect the 2 ends to the switch of the relay. Connect one wire to the «normaly open» contact (NO) and the other to the «common» contact (C) of the immobilizer relay. Connect one contact of the relay coil to 12V and the other to «Immobilizer 2» output of the device (Main cable tree: Pin 1. Green wire). Attention ! The relay needs 100 mA, if th immobilizer is released. If «Key detection mode» is enabled or «Automatic log out» is disabled by configuration, the relay will drain 100 mA during the whole time of a trip, even if the user is logged out. This could drain the car battery. To avoid this, connect the relay coil to «12V ignition on» (K15) instead of «12 Volt permanent» (K30) or use a «latching relay» .

Connecting to CAN bus wires of the vehicle

Wires to the CAN bus must be twisted. Connection to CAN-Bus must be realized with twisted wires. The cable lenth shall be as short as possible, cpecially, when connectiong to high speed CAN bus (500 kB/s).

Soldering a cable to the remote key electronics
Optional, Only needed, if not connecting central lock actuator lines to vehicle harness
Attention: Opening the housing and soldering the cable to the remote control print is delicate. Convadis is offering a service to connect the cable for you.
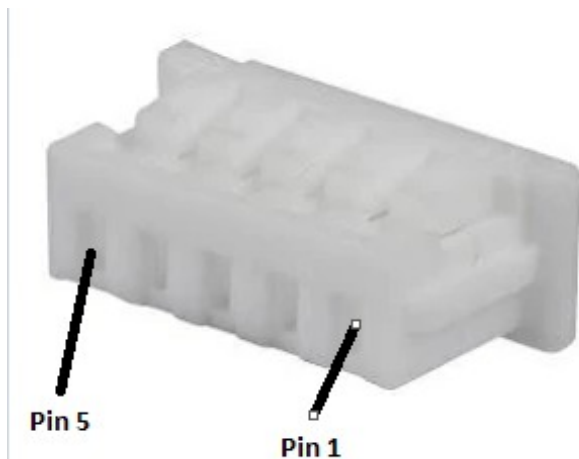
Pin	Color	Signal
1	red	Unlock
2	orange	Lock
3	yellow	Reference voltage in
4	green	3V power for Remote control battery
5	blue	Remote Control battery ground

Mounting the parts

It is critical that the mounting position of the unit is in accordance with the local government standards in the operational region of the vehicle.

Mounting of the components on the windshield is only allowed at specific locations, mainly the corners (Europe: EU standard 77/649/EWG). The mounted components cannot impair the sight to relevant areas outside the vehicle.

All components have to be placed, that in case of accident the passengers can not get injured by sharp corners or edges (EU: all parts, touchable with a bowl of 165 mm diameter in its installed position, muss have radii of >= 2.5 mm, 74/60/EwG).

All components have to be placed in a way, that they can not get touched by exploding airbags and so, that the function of the airbags will not be affected.

All components have to be placed so, that they do not affect the adjustable elements of the vehicle (e.g. interior mirror, steering wheel, o its adjustment system, seat adjustment, glove compartment cover) and so, that the parts and wires of C-Compact cannot get damaged by such components.

Mounting C-Compact main unit:

If using the RFID reader the unit is the standard mounting place in a car is in a corner at the inside of the windshield. Otherwise it can be mounted in other places, where GSM and GPS signal is available (e.g. under plastic covers of the dashboard).

Please make sure, that the unit is fixed securely to not become loose, even during a crash. Please clean the mounting place with alcohol before taping it onto the glass. l
The device is including a high frequency cell phone antenna and other RF antennas and therefore it must be placed at least 20 cm away from the passenger body in its usual position. Please also locate it 20 cm away from sensitive electronic parts and wires of the vehicle and from any other RF antenna.

Mounting of the fuel/ charging card and key fob detector unit „C-Intac":
«C-Intac" must be placed in the glove compartment of the vehicle or somewhere else, where touching passengers body in case of an accident is not possible or fullfill the conditions according the relevant regulations of the coutry or usage (EU: 74/60/EwG see above).
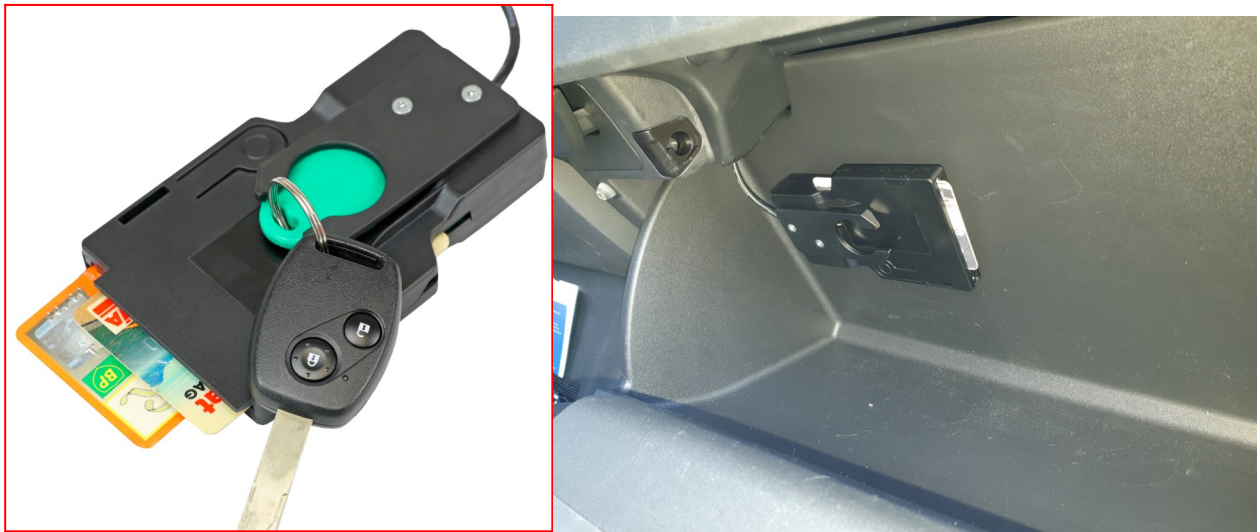
The reader can be attached either with double-sided heavy-duty adhesive tape or with Velcro tape. The surface on which the tape must be cleaned with alcohol beforehand.

Configuration and synchronization with the CCOM server

After connection, the device must be synchronized to assigne it to a vehicle and an organization.

Conditions: The installer needs an Android smartphone with our Convadis App "C-App". The app can be downloaded from Google Play. Before use, an "App key" and a "User ID" must be entered (to be obtained from the customer).

Synchronization steps:
- Create a configuration job for the "User ID" of the installer and the vehicle to be installed: This is usually done in "CCom" by the central operator prior to installation.
- Open the app and/ or press "Refresh". The previously created configuration job is now loaded onto the smartphone. It is visible in tab "Vehicles".
- Press the "Config. button" of C-Cmpact. The LED lights up red (max. 10 seconds).

- Now tap the job in the vehicle list in the smartphone. It will now be sent to the vehicle. The LED now lights up green.
- The device now establishes a connection to the CCom server and obtains the previously defined vehicle-specific device configuration from there. If necessary, the firmware on the device is also updated (duration approx. 10 minutes). Status messages appear in the app.
- At the end the LED goes out. "Synchronization complete" is displayed in the app.

Final test and documentation

In order to ensure, that the device works properly, it is essential to carry out a complete function test after each installation in accordance with our document *"CBox Compact final test.pdf"* (available in CComE dokument server (folder„General" - „C-Compact"). Check all functions according to this document and fill in the test results accordingly.

If the installation si done different than documented inside the vehicle-specific installation manual, both your customer and Convadis require the relevant information in order to be able to provide reliable support and locate the problem in an emergency. Please forward the information. Convadis will then include the variant into the installation manual and make it available to all installers.

Additional info

For aditional info about the user functions, please check our Wiki (wiki.convadis.ch) or contac us Tel. +41 56 290 35 45. Email: support@convadis.ch