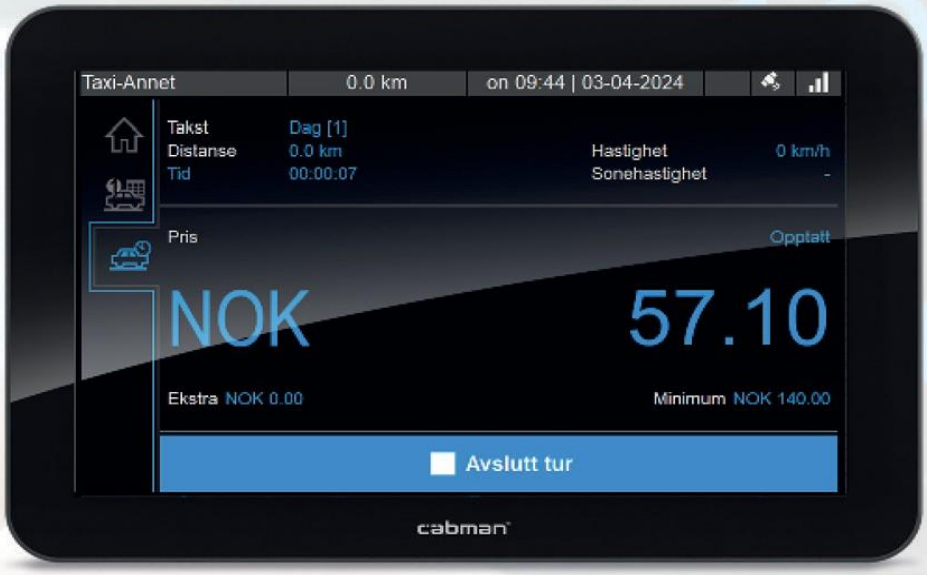
QTech as

cabman MDT



Cabman MDT Installation Manual

Content

1. Introduction

The Cabman MDT is a mobile computer, made for handling of trips and vehicle logistics in a car as quick, simple and intuitive as possible. The Cabman MDT can be set up in different ways, to be able to handle different transportation types.

The Cabman MDT consists of a 5 or 7 inches MDT display that acts as the user interface, and a MDT Box that contains the logic. For the taxi market in Norway, the Cabman MDT is always set up with integrated MID-certified taximeter and datacom modules. A printer is also supplied. Normally a payment terminal is also a part of the package. See figure 1-1.

Figure 1-1: Cabman MDT Display

The MDT display has a touch screen and is be operated entirely by using the fingers. On the right-hand side of the screen, there is a USB-C port and a card reader. See figure 1-2.

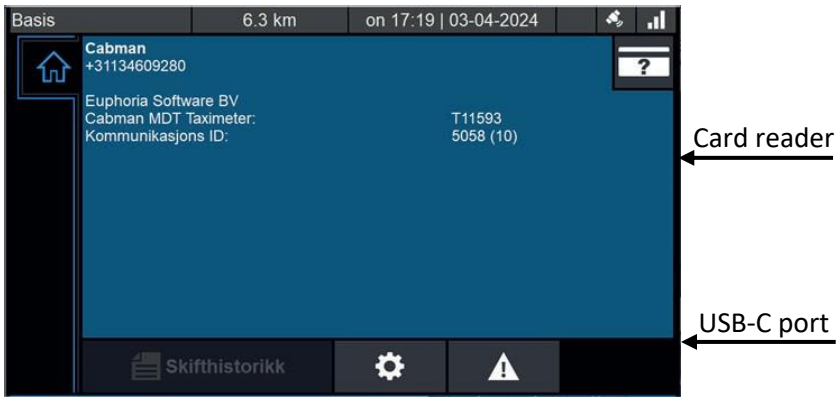


Figure 1-2: Cabman MDT touch display with card reader and USB-C port

1.1. Workshop login

Workshops log in using smartcards called workshop cards. These cards are only to be used by the specific MDT workshops to securely identify the workshop. As an alternative, a specific login code can be used by a workshop. This ensures that only authorized persons can read and adjust data in the MDT, and that they only have access to the data for their own customers.

1.2. Home screen overview

The home screen consists of the following elements, see figure 1.3:

1. Work mode and work level indication. This can be used to recognize which type of user is logged in and how time and kilometres are registered.
2. Mileage registered by the Cabman MDT since activation
3. Local time and date of the Cabman MDT
4. Indication symbol for GPS reception
5. Indication symbol for data communication reception
6. Login button to log in with driverid
7. Trip overview. Depending on the access rights, a complete overview or only the current service can be seen here
8. Options button
9. Status button
10. Main screen. User or status dependent information is shown here.

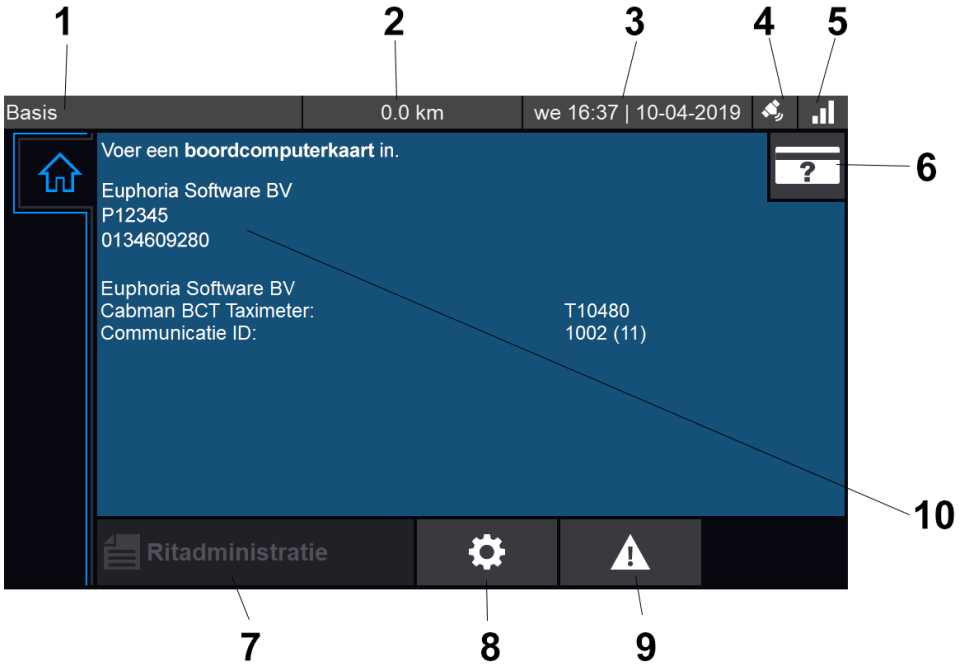


Figure 1-3: Home screen overview

1.3. Diagnosis and self-test

The Cabman MDT is equipped with a self-test used to find whether the Cabman MDT is functioning properly. In the Home tab you can press the Status button (see figure 1-3, button 9). This immediately starts the self-test and shows the system status, see figure 1-4.

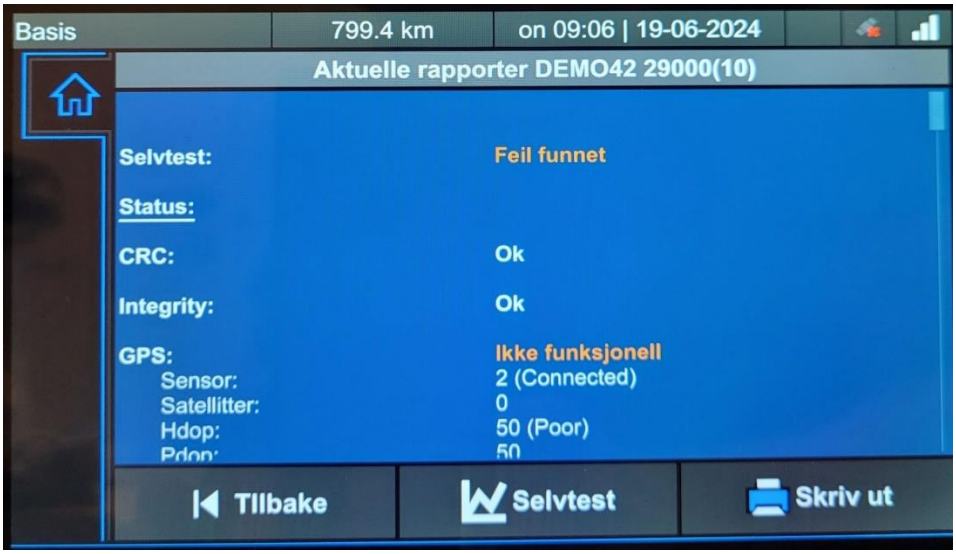


Figure 1-4: Selftest overview

The selftest shows the current status of a number of features, and indicates if status is OK or if there is an error situation. An overall status is shown on the top of the screen.
The tested features are:

- CRC test
- System data integrity
- GPS sensor
- ODO sensor
- Accelerator sensor
- Ignition status
- Rooflight status
- Taximeter, indicates if an internal or external taximeter is used
- Processor
- Printer
- Data communication
- GSM modem

Manual self-test may be started, by pushing the 'Selftest' button. The manual self-test consists of:

1. A check of the touchscreen, press the indicated rings until the Cabman MDT gives a sound signal
2. A check of the entire color spectrum (red, green and blue) to validate that the LCD is functioning correctly. You can then complete the manual test.

2. Preparing for installation

2.1. Checking that all parts are available

Before starting the installation, always check that all parts of your Cabman MDT are available. The following parts are needed:

- The Cabman MDT Display (5 or 7 inches) with product number PN: 8008-00X. The product number is shown on the label on the back of the display.
- The Cabman MDT Box with product number PN8007-00X
- The Cabman MDT Software version to be used: 1.2-221B5D53.
- The power cable. The label on the cable: 1032-001-300. Connector: X101.
- The printer cable, provided together with the printer. Connector: X103.
- The rooflight cable . Label on the cable: 1040-001-300. Connector: X104.
- The connector cable. Label on the cable: 1033-001-300. Connector: X106.
- The display cable , with two USB-C connectors. NB: Only works one way! Connector: X107.
- The GPS Antenna. Only use the antenna supplied by Euphoria.
- The MyPOS Go2 payment terminal
- The roof light
- The GSM antenna
- Display mounting bracket
- The SIM-card
- The COM3 dongle

2.2. Checking the Cabman MDT seals

Two seals must be present on the Cabman MDT box before installation, and also during normal operation. The seals are vital for the validity of the Cabman MDT. Figure 2-1 shows where the seals should be placed when the MDT Box is shipped by the supplier. If any of the seals are missing or damaged, the Cabman MDT Box should be returned to the supplier.

Figure 2-1: Seals that should be present on the Cabman MDT Box

3. Installation

If all parts are present and correct, the actual installation can be started. Follow the steps given in this section. If you deviate from this order, Euphoria cannot guarantee that the Cabman MDT will function in accordance with the requirements.

3.1. Location of the equipment

The location of the equipment must be optimized to meet the functional requirements for the specific equipment. Keep this in mind during the installation.

3.1.1. GPS Antenna

The GPS Antenna must be placed in such a way that the top of the antenna has a clear view towards the satellites. The antenna functions optimally if it is mounted flat on a grounded ground. The quality of the reception can be negatively affected if the antenna is placed incorrectly, for example behind a coated window, under the dashboard, near electrical sources of interference etc.

3.1.2. GSM Antenna

The GSM antenna should be placed as high as possible in the car, to optimize the GSM coverage.

3.1.3. Cabman MDT Display

The MDT display can have the size of 5 or 7 inches. It must be mounted where it is accessible for the driver, and where it is easily readable by all passengers.

3.1.4. Cabman MDT box

The MDT Box can be mounted in the glove compartment, hidden under the dashboard or elsewhere where it is not in the way. The Cabman MDT Box must be installed so that the seals from figure 4-1 are visible, and so that the covers next to the seals are freely accessible.

3.1.5. The printer

Place the printer in a location where the driver can replace the printer rollers in an ergonomic way. The most used position is on the top of the dashboard, to the left for the steering wheel.

3.1.6. SIM Card installation

The SIM-card must be installed into the SIM card slot marked with “B”, under the cover up to the right of the taximeter. This is shown in Figure 3-1.

Figure 3-1: SIM-card location in the Cabman MDT Box

3.1.7. Roof light

The roof light must be located and mounted according to the Norwegian legislation.

3.2. Connecting the cables

3.2.1. Connect the X101 power cable to the car

The power supply must be connected to a 12V power supply, where the red cable is connected to the 12V and the black cable to the ground, see figure 3-2. This power supply must be permanent and may therefore not be interrupted during e.g. starting, or when the vehicle is stationary for a while. See chapter Appendix 1.2 for the power requirements.

X101: Main supply rating 10A		Dir	Signal	Color
1	0V	P	Main supply ground	BLACK
2	+12V	P	Main supply IN	RED

Figure 3-2: X101 Powercable

3.2.2. Connect the X103 printer cable

The printer connects with the X103 printer cable, distributed together with the printer. The connections used in the cable is shown in figure 3-3.

X103: Printer		Dir	Signal
1	COM3:RX	I	RXIN3
2	0V	P	GND
3	COM3:TX	O	TXOUT3
4	User output 2	O	POUT2

Description	Value Min.	Typ.	Max.
POUT2, 12V digital output		800mA	1A
COM3 RS232 interface	-10V Baud: 1200		+10V Baud: 115200

Figure 3-3: X103 Printer cable

Open the back cover of the printer. Drag the white connector of the attached cable through the opening on the side of the printer and connect to the printer connector. Make sure the cable plug is securely installed in the opening. See figure 3-4. The printer's power is supplied by the Cabman MDT, causing the printer to turn on and off automatically.

Figure 3-4: X103 Printer cable connected to the printer

3.2.3. Connect the X104 rooflight cable

The connections used in the rooflight cable is shown in figure 3-5.

X104: Add-on		Dir	Signal
1	COM4:RX	I	RXIN4
2	COM5:RX	I	RXIN5
3	0V	P	GND
4	COM4:TX	O	TXOUT4
5	COM5:TX	O	TXOUT5
6	User output 3	O	POUT3

Description	Value Min.	Typ.	Max.
POUT3, 12V digital output		800mA	1A
COM4,5 RS232 interface	-10V Baud: 1200		+10V Baud: 115200

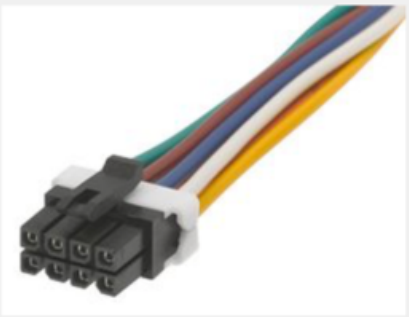
Figure 3-5: X104 Rooflight cable

3.2.4. Connect the X106 CAR cable to ignition and pulse

The ignition lock should be connected to Contact-in (green cable DIN1 in figure 3-6) of the MDT box. This input is high-impedance, it works with a low signal current.The MDT is compatible with most standard pulse signals found in vehicles. The maximum pulse frequency is 10Khz. Car pulses in are connected to brown cable DIN2 in figure 3-6 below.

X106 CAR

X106: Car		Dir	Signal	Color
1	Pulse out	I/O	LIN_OUT2	BLACK
2	User input 3	I	DIN3	RED
3	CAN1 low	I/O	CAN1L	ORANGE
4	CAN2 low	I/O	CAN2L	YELLOW
5	Contact in	I	DIN1	GREEN
6	Pulse in	I	DIN2	BROWN
7	CAN1 high	I/O	CAN1H	BLUE
8	CAN2 high	I/O	CAN2H	WHITE



Description	Value Min.	Typ.	Max.
DIN1 = contact in signal	< 2V = OFF		> 3V = ON
DIN2 = pulse input signal	< 2V = LOW 0Hz		> 3V = HIGH 10 Khz counts on rising edge
DIN3 = Seat contact	< 2V = LOW		> 3V = HIGH Use pull-up when connecting to open collector or output
CAN1, CAN2 can bus			
Pulse out, LIN_OUT2	0 Hz 0V	-	10 KHz 12V

Figure 3-6: X106 CAR Cable

3.2.5. Connect the X107 USB-C cable to the Cabman MDT Display

Place the USB-C X107 Cable on the back of the display. Then screw on the strain relief and place the display cover. NB: Only works one way! If the cable does not work the way it is installed, it has to be turned around.

3.2.6. Connecting the cables to the Cabman MDT Box

Connect the cables to the Cabman MDT and press the headers firmly in place. The GPS Antenna must be connected to the SMB connector. The GPS Antenna is correctly connected when it clicks into place. Finally, the X107 Display cable must be connected. Figure 3-7 shows where the cables should be connected. Then bring the cables out through the cable duct.

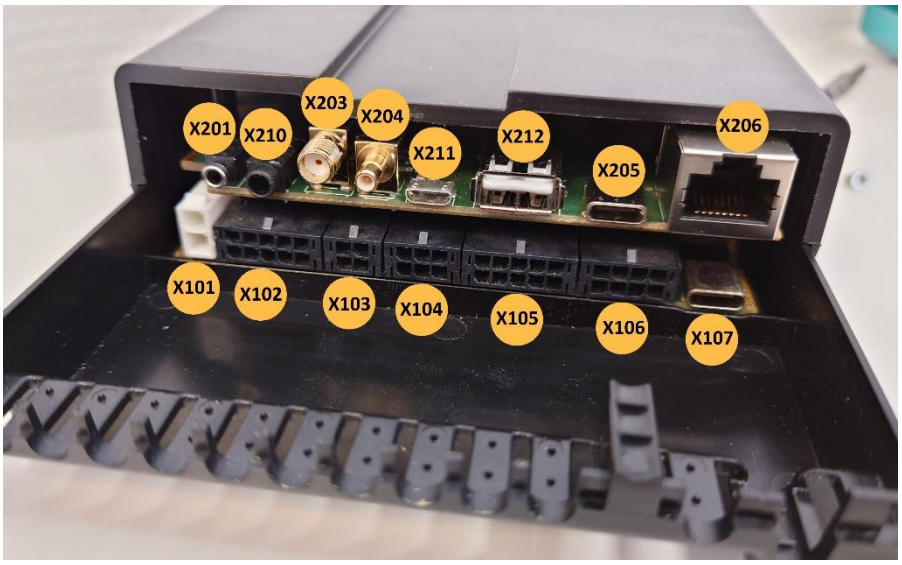


Figure 3-7: Connections on the Cabman MDT Box

3.2.7. Securing the cables

When the cables have been routed out through the cable ducts, secure the cables with cable ties. The cable ties provide strain relief on the cables. See figure 3-8.

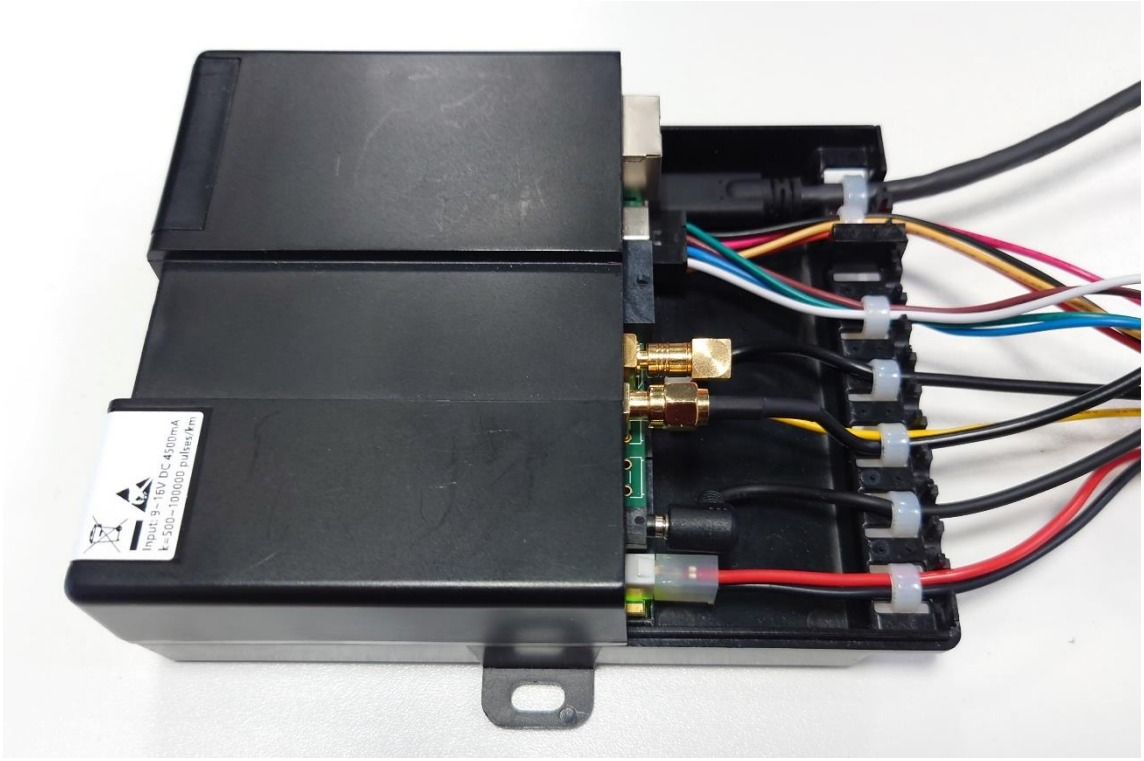


Figure 3-8: Secured cables

3.2.8. Close the cable cover

Place the cable cover and close the cover by gently pressing it until it clicks into place. Use the cover screw to lock the cover.

4. Activation and configuration

The Cabman MDT must be activated and configured before use. To enable setting of parameters that will be protected by seals later, the COM3 dongle must be inserted into the MDT box, as shown in figure 4-1.

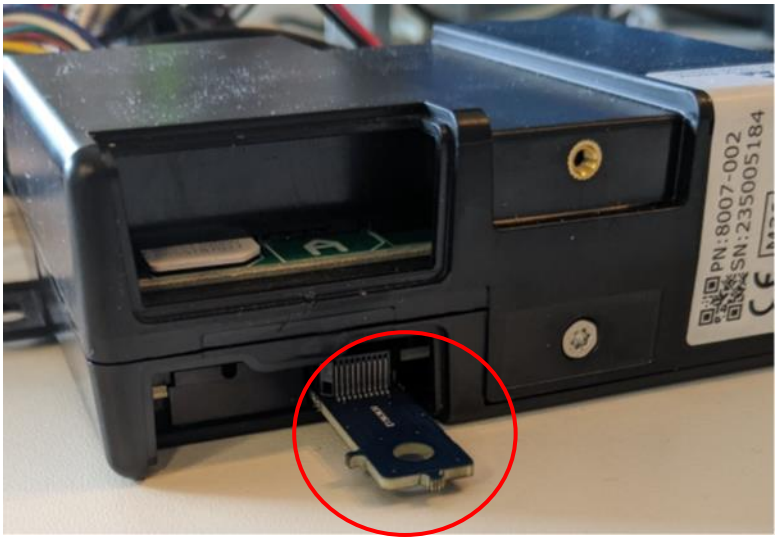


Figure 4-1: Inserting the COM3 dongle

The activation process for the Cabman MDT starts automatically if the Cabman MDT has not been activated earlier.

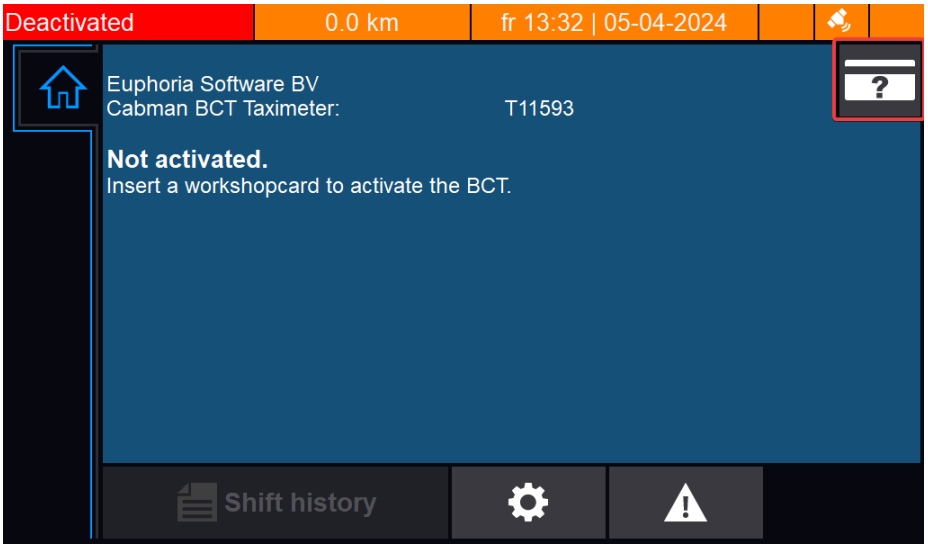


Figure 4-2: Cabman not activated

When activation is started, the system asks if there are updates to be installed, see figure 4-3.

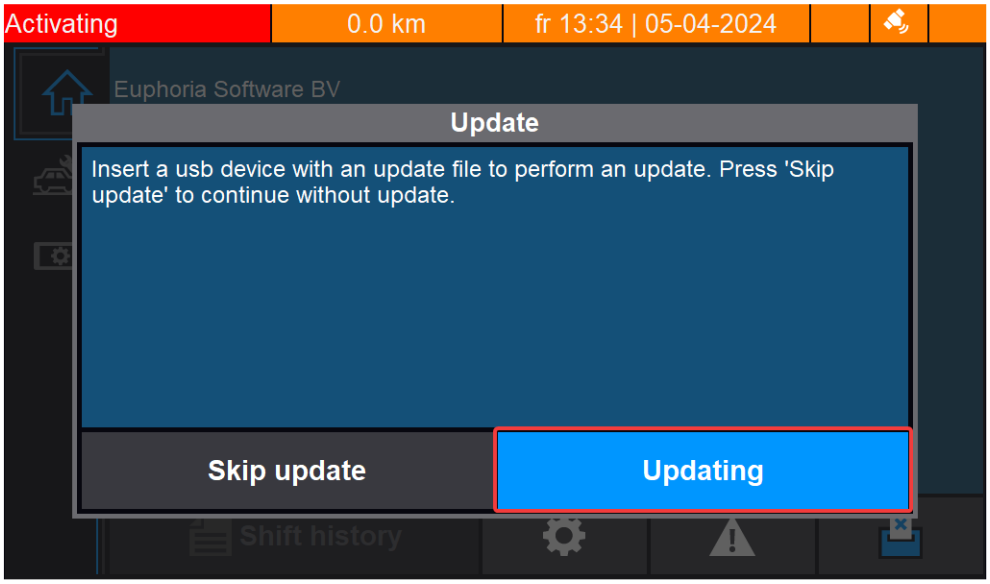


Figure 4-3: Updating the Cabman MDT

Updates can include software updates, tariff files, and other configuration data. If there are updates to be installed, insert the USB device with the updates in the USB -C port on the right-hand side of the display. Then press “Updating”. The Cabman MDT then downloads and installs the updates, and restarts. When updates are installed, start the activation sequence once more.

When there are no more updates to install, press “Skip update” as shown in figure 4-3 over.

Then the MDT asks if it should retrieve configuration data from the USB device, see figure 4-4.

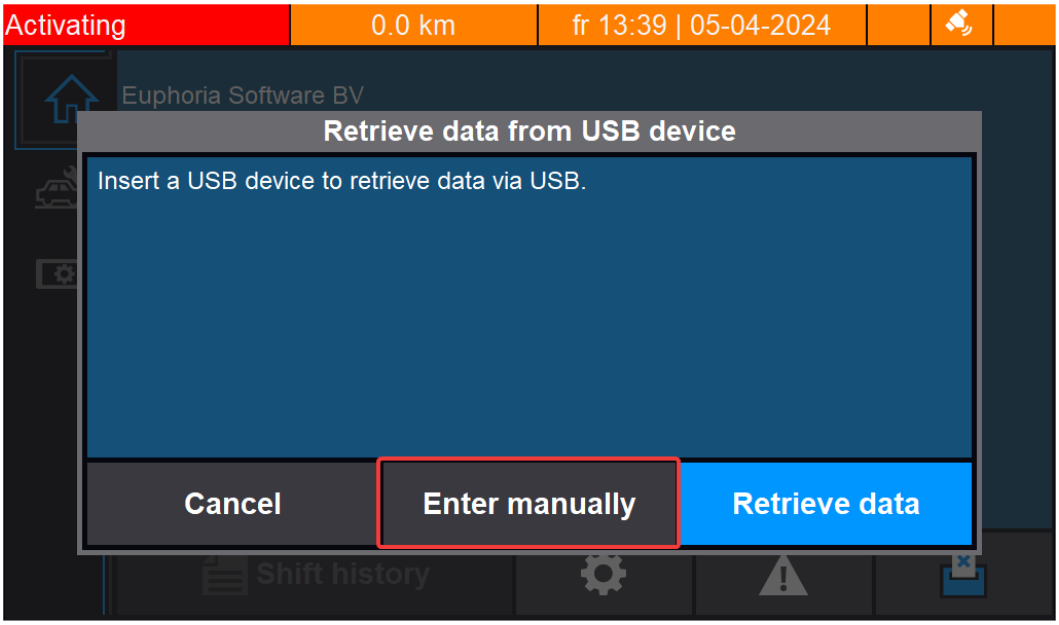


Figure 4-4: Entering configuration data

The configuration data is entered manually, so press the button “Enter manually”.

The licence plate number for the car then must be provided. See figure 4-5.

Figure 4-5: Providing car licence plate information

Then the activation and configuration data must be provided. First, the product license of the Cabman MDT must be inserted, as provided by the supplier. See figure 4-6 and 4-7.

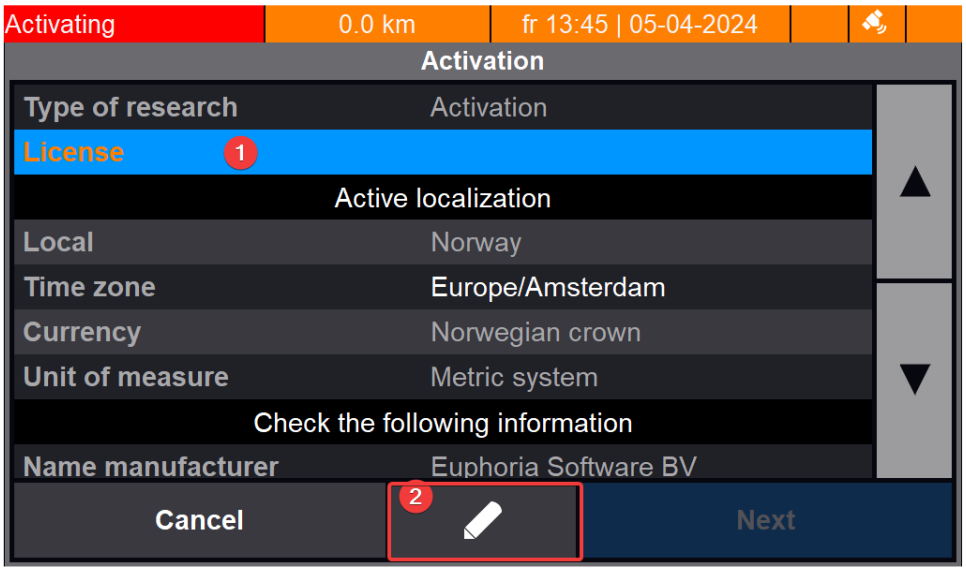


Figure 4-6: Inserting the product license number

Figure 4-7: Entering the product license number

Then check and fill in the following data in the corresponding activation data fields:

1. Car brand
2. Car model
3. Car type: “Taxi”
4. Country code: “NO” (Norway)
5. Mileage: The mileage from the car dashboard when the taximeter is activated
6. Taximeter: “Internal taximeter”
7. Printer: “On”
8. COM3 Seal: “On”
9. Vehicle: “Normal” for up to 4 passengers, “Normal pluss” for up to 8 passengers
10. Vehicle ID: Fill in the taxi license number
11. Remark: Additional information about inspection/examination result.

Scroll down to the bottom of the screen, and press the “OK”-button to store all parameter values. Press the “Next” button for filling in company data. The following parameters should be set:

1. External code: Set to the external code for the customer or the subcontractor, as received from the supplier
2. Phone number company: The phone number to be printed on receipts
3. Name: The company name to be printed on receipts
4. Address: The company address, to be printed on receipts
5. VAT number: The VAT number to be printed on the receipts
6. Country code: Country code for customer or subcontractor. Normally set to “NO” (Norwegian)

Scroll down to the bottom of the screen, and press the “OK”-button to store all parameter values. Press the “Next” button to start setting general options. The following options should be set:

1. Roof sign: “Rooflight analog”
2. Datacom: “Remote”

3. Printer: “Cabman Printer”
4. POS: “MyPOS” (if myPOS payment terminals are used)

Scroll down to the bottom of the screen, and press the “OK”-button to store all parameter values. Press the “Next” button to start setting Data communication parameters. The following parameters should be set:

1. Company ID: Set to the company ID for the customer, as received from the provider.
2. Unit ID: Set in the Unit ID for the taximeter, as received from the provider

Scroll down to the bottom of the screen, and press the “OK”-button to store all parameter values. Then press the “Next” button to complete activation process. Reboot the taximeter by pressing the “Reboot” button, as shown in figure 4-8.

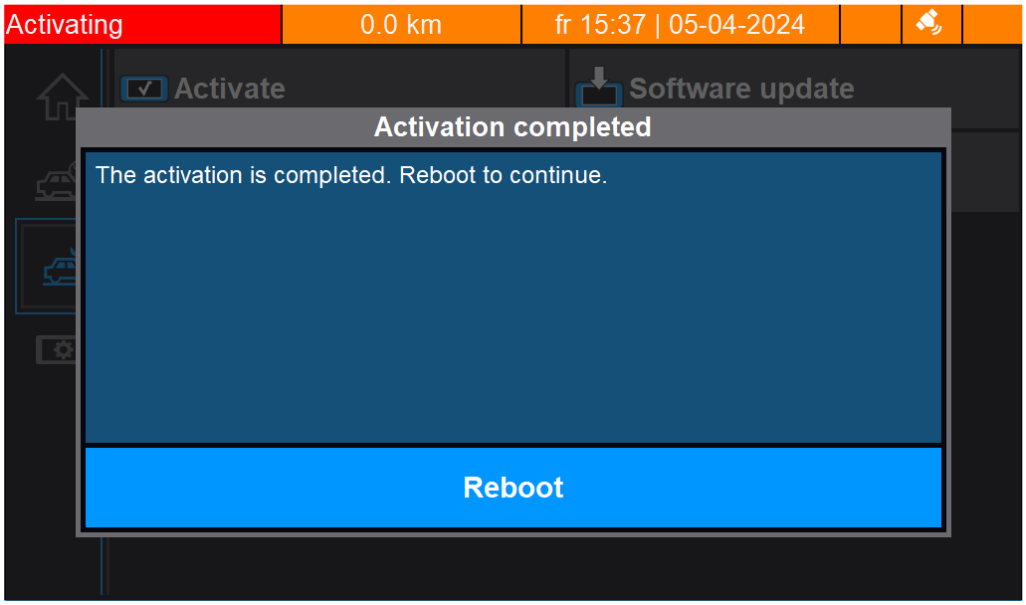


Figure 4-8: Activation completed, ready to reboot.

5. Calibration

Calibrating the Cabman MDT means finding and registering the pulses received per kilometre in the form of the K-factor.

The K-factor is measured while driving. A distance of 1 kilometre is used, and the K-factor is found by pressing the 'Do measurement' button at the K-factor setup screen, see figure 5-1.

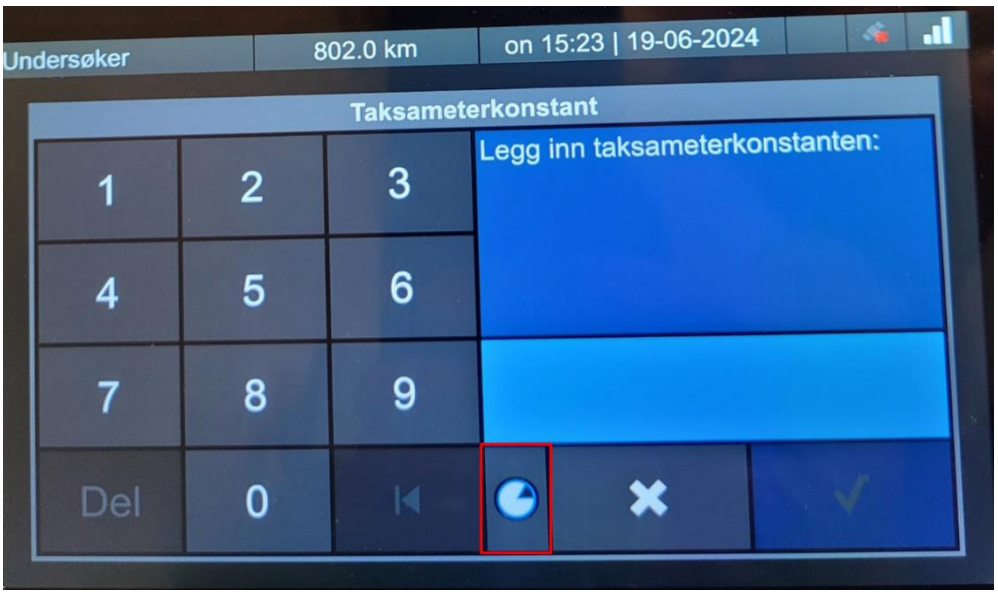


Figure 5-1: Start measuring the K-factor

The K-factor measurement starts immediately. See figure 5-2. It is possible to start new measurements by pressing the “Perform measurement”-button.

Press the “OK” button to stop measurements.

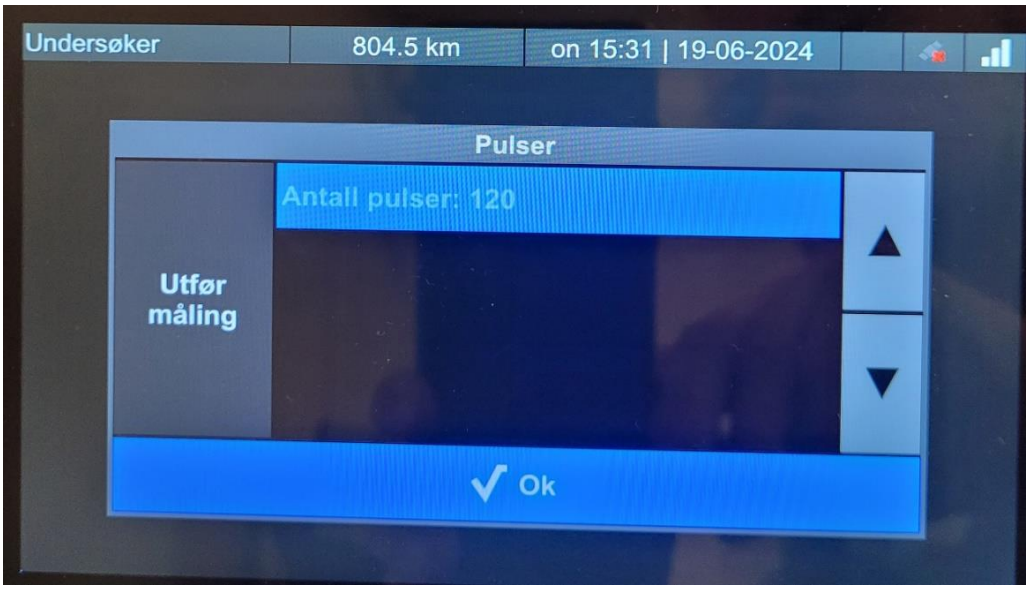


Figure 5-2: Measuring the K-factor

This gives return to the screen shown in figure 5-1. Enter the number of pulses that correspond to one actual kilometre, and press the “V”-button. The K-factor may differ by a maximum of 3% (30 meters per kilometre).

6. Final check

After a correct calibration of the Cabman MDT, you must also check the parameters from the self-test in addition to the K factor. Successful completion of the verification steps described in this section means that the Cabman MDT is working completely, correctly and properly. The self-test can be found under the button with the exclamation mark on the main screen under the heading 'self-test'.

The first line indicates whether any errors were detected. Then all individual parts are specified. If the first line indicates that there is an error, you can find below which part is not functioning properly. There is also the option of validating the touchscreen through the self-test. Here you can check the touch function and the colors of the Cabman MDT. Here is a list of the different checkpoints shown in the overview and how to check them:

1. When you start the car, the Cabman MDT screen should come on automatically
2. The Cabman MDT must also switch on as soon as a Workshop-card is entered. To test this, you must first log out and switch off the ignition.
3. The GPS antenna is checked by finding that there is a fix with at least four satellites. This is done in the selftest overview, see Figure 1-4.
4. The GSM antenna is checked by finding if there is a GSM coverage. This is done in the selftest overview, see Figure 1-4.
5. The ODO meter can be checked by driving the vehicle, when driving faster than 5 km/h for a period of at least 15 seconds, the status must change to 'driving'.
6. The integrated motion sensor can be checked by viewing the status after driving the vehicle. This should be set to 'ok'.
7. The ignition switch can be checked by turning the key of the vehicle and waiting a few seconds, this will change the status to on or off.
8. The printer can be checked by pressing the print button in the overview screen, in addition, the status of the printer changes if it cannot connect.
9. If the CRC, integrity or motion sensor are not set to 'ok', please contact the supplier.
10. The rooflight is checked by logging on the taximeter, and testing if the rooflight is turned on/off.

7. Sealing the taximeter

In Norway, it is a legal requirement that cable connection and the COM3 ports are sealed. This must be applied by the workshop as the last act after the operation of the MDT has been fully checked.

The COM3 lock must be removed. Then all taximeter covers must be put in place. Sealing is done by putting the seals in position 3 (cable cover) and 4 (COM3) as indicated in figure 7-1.

Figure 7-1: Taximeter seals

Please note that the seals must be inspectable. The Norwegiaan seals deviates from the ones shown in the picture. The Norwegian seals are numbered.

8. Reporting to Justervesenet

After sealing, the taximeter must be registered in the Justervesenet taximeter database. Log in to the Justervesenet page on https://ds.justervesenet.no/logginn, and register all required information. The taximeter can not be used commercially if it is not correctly registered in the Justervesenet database. If the taximeter is controlled and the taximeter is not correctly registered, the taxi owner can be fined.

9. Deactivating the taximeter

The Cabman MDT must be taken out of use (deactivated) the moment it is permanently removed from a vehicle, for example to be converted into another vehicle. During deactivation, all stored data will be deleted with the exception of system data and position data. You can deactivate the Cabman MDT by pressing the deactivate button on the settings tab.

Appendix 1. Technical specifications

This chapter describes the technical specifications of the MDT. This chapter should be used as a reference for connecting and using the MDT.

Appendix 1.1. Environment

The Cabman MDT is designed to operate reliably and within specifications within the environmental conditions described below.

Description	Value	Remarks
Operating ambient temperature	0ºC … +55ºC	-
Peak operating ambient temperature	-20ºC … +70ºC	Functional, full lifetime not guaranteed
Operating relative humidity	10%...90%	Condensing
Storage temperature	-20ºC … +70ºC	-

Appendix 1.2. Power

The Cabman MDT requires a power source that supplies 12V continuously without interruption. Typically, it connects directly to the vehicle's battery. The table below contains the power supply specifications:

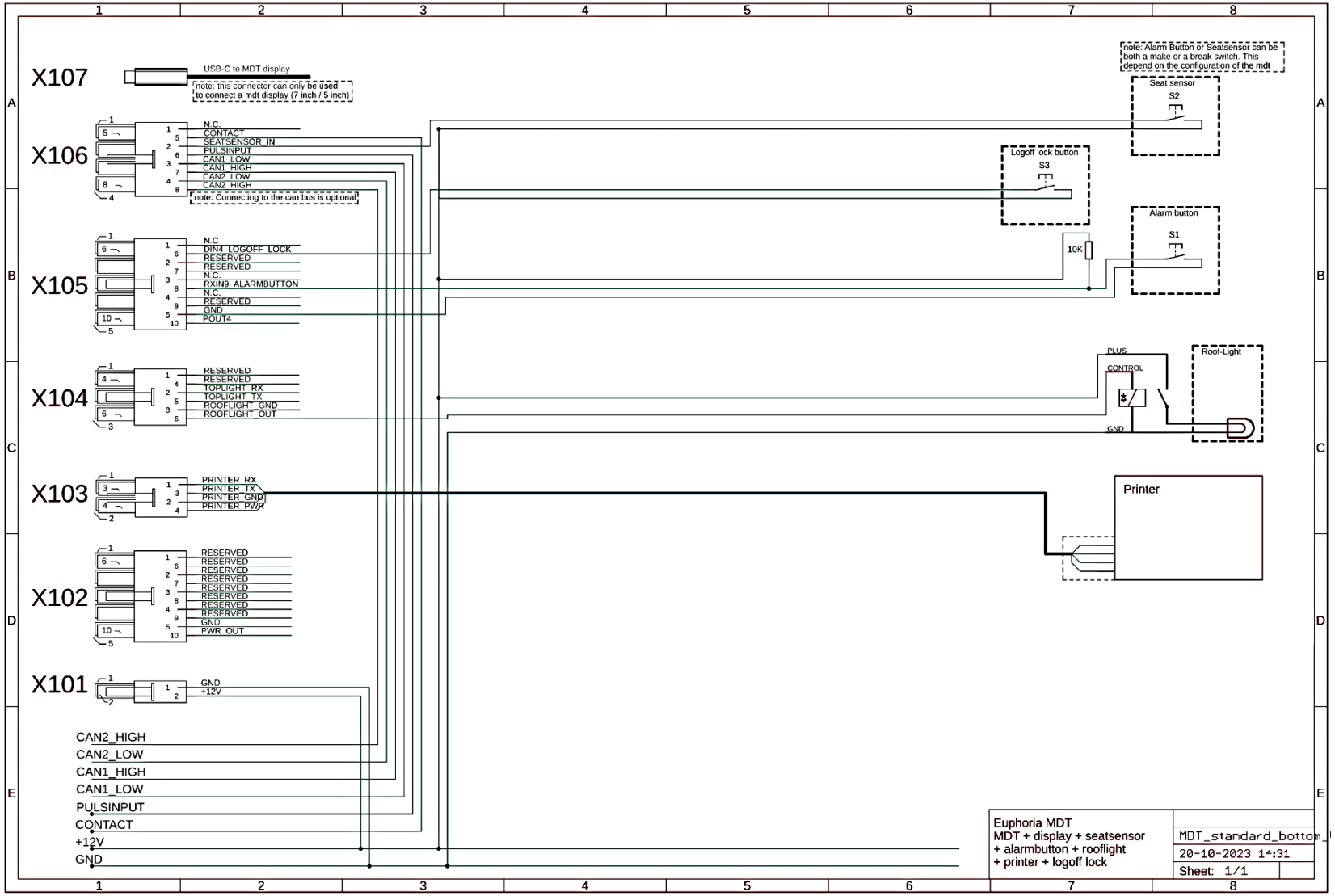
Description	Min.	Typ.	Max.
Input voltage	9.0V	12.0V	16.0V
Input current @ 12V (normal)	200mA	500mA	4500mA
Input current @ 12V (standby)		2mA	20mA

Appendix 1.3. Essential Characteristics

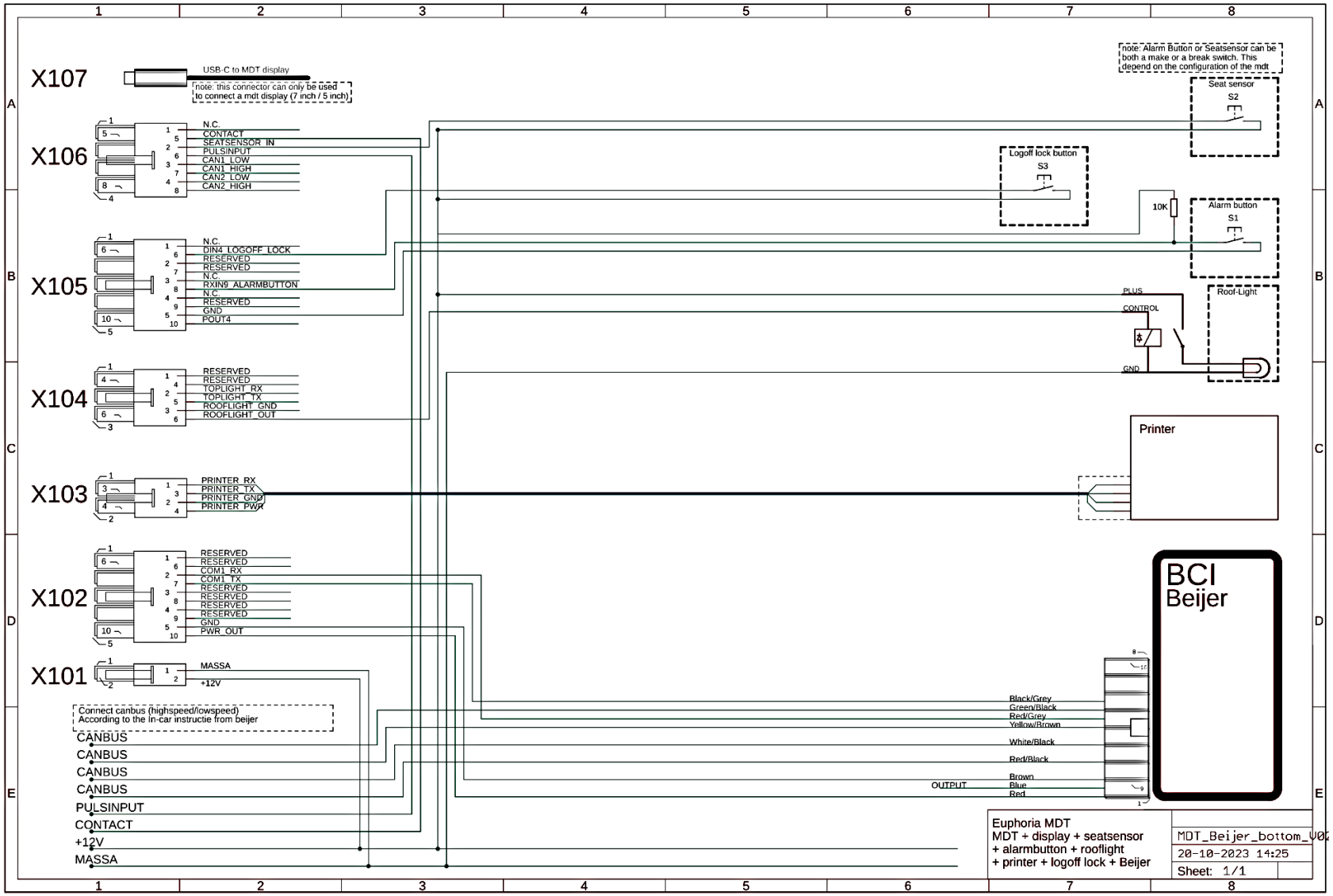
Characteristic		Value	
Electromagnetic environment class		E3	
Mechanical environment class		M3	
Climatic environment	Temperature	-20 ºC / +70 ºC	
	Humidity	condensing	
	Intended location	closed	
		Range	**Resolution**
Distance signal generator constant k		500 pulses/km to 100000 pulses/km	1 km
Time tariff		0,00 CU/h to 3600,00 CU/h	0,01 CU/h
Distance tariff		0,00 CU/km to 140,00 CU/km	0,01 CU/km
CU = Currency unit			
Time measuring signal frequency		10 Hz	
Maximum measuring range distance		42949 km	
Maximum measuring range time		1193 h	
Minimum storage time of metrological data		1 year	

Appendix 2. Connection diagrams

Appendix 2.1. MDT standard connection diagram



Appendix 2.2. MDT connection diagram + Beijer



Appendix 2.3. MDT connection diagram + iToplight