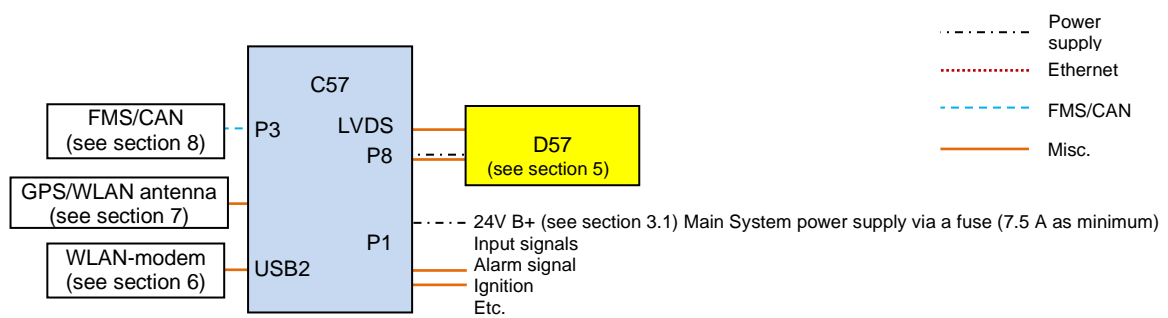THOREB

Installation of the C57, Asseco Poland
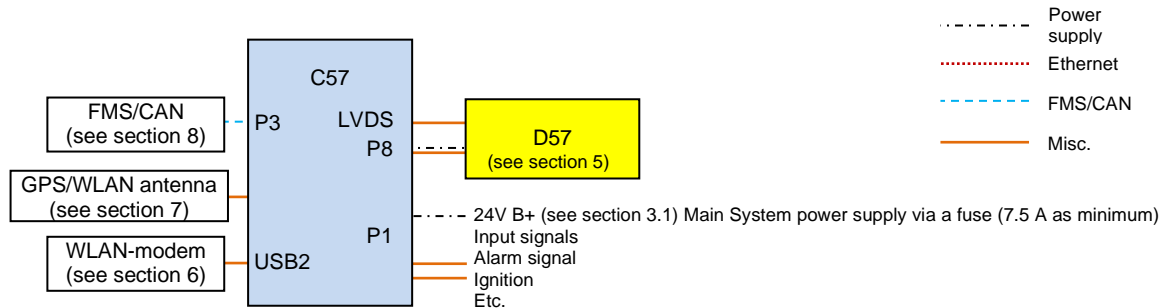

Summary

This document describes how to install the C57 unit and how to connect and install its display and peripherals. The C57 is a version of C75 (previously known as C74 type75) which maintains most essential functionality and components.
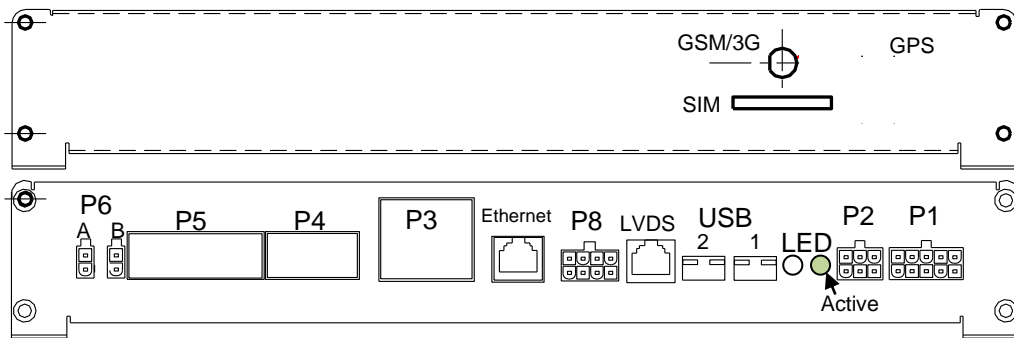
Contents

Introduction

This document describes how to install the C57 unit and how to connect and install its display and peripherals. There might be additional cable lengths available that are not included in this document.

1. Connector Overview

1.1 C57

P1	**Inputs/Outputs, Unit power supply** 1. Stop signal input 2. 24 V, 1 A output 3. 24 V, 1 A output 4. 24 V, 1 A output 5. Unit GND supply 6. Odometer signal input 7. Main Switch input 8. Door signal (not ELSY) input 9. Emergency alarm button input 10. Unit +24V supply	P4	**IBIS signs** **RS485 signs** 3. Rx- 14. Shield 4. Rx+ 15. RS485-A 12. Tx- 16. RS485-B 13. Tx+ **RS232 (spare)** **RS485 ELSY** 1. SGND 5. Shield 2. Shield 6. RS485-A 8. Rx 7. RS485-B 9. Tx **RS232** 3. SGND 10. Rx 11. Tx
P2	**Radio modem power supply** 4. 12 V or 6. 24 V	P5	**RS232** **Headset** 1. SGND 10 GND 2. Shield 11. Mic. inp. 15. Rx 12. Ear piece 16. Tx **Amplifier** 6. Ctrl output to select loudspeaker 7. Ctrl output to activate the amplifier 13. Audio line out L+ 29. Audio line out L -
P3 grey	**CAN** 1. CAN A H, term. 4. CAN B H, term. 2. CAN A H 5. CAN B H 3. CAN A H 6. CAN B H 11. CAN A L, term. 14. CAN B L, term. 12. CAN A L 15. CAN B L 13. CAN A L 16. CAN B L 7. CAN C H 17. CAN C L 8. CAN C H 18. CAN C L 9. CAN D H, embedded termination 19. CAN D L, embedded termination		
P3 black	**Video in** 21. Video IN 1 31. Video GND 22. Video IN 2 32. Video GND 23. Video IN 3 33. Video GND 24. Video IN 4 34. Video GND 25. 12 V camera supply (if no video rec.) 26. GND camera supply **Driver keypad** 29. Backlight 38. Arrow up 39. Arrow down 40. Execute	P6A	**Loudspeaker driver, 12 W** 1. SPK - 2. SPK +
		P6B	**Loudspeaker passenger, 24 W** 1. SPK - 2. SPK +
		P8	**Driver display** 3. D57-B 4. 24V 7. D57-A 8. Shield
LVDS	Driver display, FPD-Link over LVDS	USB1	For software update/transfer /3G modem (optional)
Ethernet	Network	USB2	WLAN modem

The following connectors and sockets are used together with the C57, art. no. 17155:

Connector	Name	Sockets	
P1	Socket housing MiniFit Jr 10 pos. art. no. 14606C-P00	Socket MiniFit Jr 0,24-0,96 mm² art. no. 14607A-P00	
P2	Socket housing PowerMate 6 pos. art. no. 14614B-P00	Socket PowerMate 0,5-1,32 mm² art. no. 14615A-P00	
P3	Socket housing MQS 40 pos. art. no. 14941A-P00	Socket MQS 0.25-0.5 mm² art. no. 14928B-P00	
P4	Socket housing IL-AG5 16 pos. art. no. 11202	Socket IL-AG5 0.35-0.5 mm² art. no. 11203	
P5	Socket housing IL-AG5 30 pos. art. no. 14163A-P00	Socket IL-AG5 0.35-0.5 mm² art. no. 11203	
P6 A/B	Socket housing MiniFit Jr. 2 pos. art. no. 14606B-P00	Socket MiniFit Jr. 0.24-0.96 mm² art. no. 14607A-P00	
P8	Socket housing MiniFit Jr 8 pos. art. no. 14606E-P00	Socket MiniFit Jr 0,24-0,96 mm² art. no. 14607A-P00	
Ethernet	RJ45		
LVDS	RJ45		
GPS anntenna	SMA (m)		
3G antenna	FME (f)		

Use

- crimp tool art no. 14628B-P00 for the Power-Mate sockets
- crimp tool art no. 14641B-P00 for the Mini-Fit Jr. sockets
- crimp tool art no. 14432G-P00 for the MQS sockets (cable area 0.25-0.50 mm²)
- crimp tool art no. 11204B-P00 for the IL-AG5 sockets.

Use tool
- art. no. 14629B-P00 for removing the Power-Mate sockets
- art. no. 14927A-P00 for removing the MQS sockets
- art. no. 11216 for removing the IL-AG5 sockets.

1.2   D57

The following connectors and sockets are used together with the D57 display, art. no 14946B-PYY:

Connector	Name	Sockets	
Power supply	Socket housing MiniFit Jr 4 pos. art. no. 14606D-P00	Socket MiniFit Jr 0,24-0,96 mm² art. no. 14607A-P00	
LVDS	RJ45		

2.   Ground Connections in General

Bad ground connections can cause interference and potential differences in ground references. This unavoidably decreases the system's interference margins, or at worst causes (mostly intermittent) "inexplicable" malfunctions, which are difficult to locate.
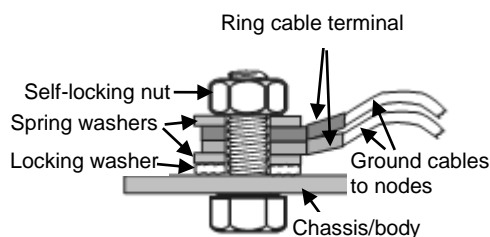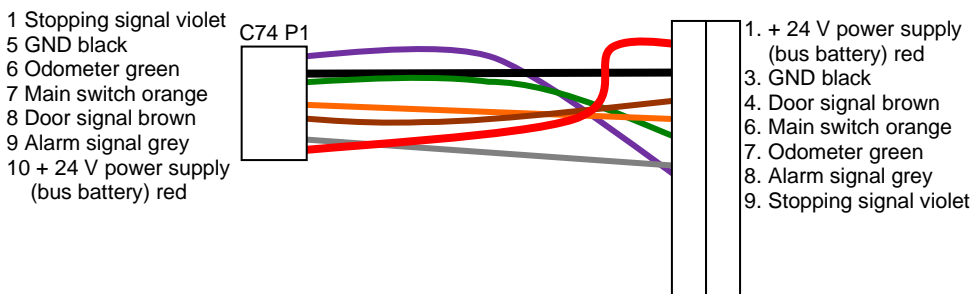

Figure 1. Example of ground connection

Ground connections to chassis and body shall be clean. Screws in combination with a nut, should be tightened with a moment of torsion according to your company standard. Use tin-plated ring cable terminals (if possible zinc-plated), together with zinc-plated locking washers and spring washers. When all ground cables are attached, the entire ground connection shall be sprayed with wax or similar, as moisture protection. If the surface of the ground connection has been treated against rust, a lock washer is necessary in order to guarantee good conductivity.

All units should be connected to the same ground connection if nothing else is stated.

3. C57 Power Supply and Input Signals

The cable 17158C-P01, length 0.5 m, is used for connecting power supply and input signals to the C57 unit.

1 Stopping signal violet
5 GND black
6 Odometer green
7 Main switch orange
8 Door signal brown
9 Alarm signal grey
10 + 24 V power supply
(bus battery) red

C74 P1

1. + 24 V power supply
(bus battery) red
3. GND black
4. Door signal brown
6. Main switch orange
7. Odometer green
8. Alarm signal grey
9. Stopping signal violet

The C57 should be protected by a 7,5 A slow fuse (fuse art. no. 14513D-P00, fuse holder art. no. 14512A-P00) on both position 1 and 6 on the connection block.

CAN signals (FMS or J1939) that should be used by C57 should be stated in the text file vehiclemodel.xml (described in the document "Parameter Settings for dv_applications_C74 3.xx").

NOTE!
The vehicle computer power supply should not be turned on, until ALL cables are connected to all peripherals. Before disconnecting any cable, the power supply to the vehicle computer should be turned off.

3.1 C57 Power Supply

The C57 should have **constant power supply via a 7.5 A slow fuse**. The main switch signal is used to determine if the vehicle computer should be in sleeping mode or not. In order to minimise the power consumption when the main switch is off, the C57 is only active for a short while during the night, to activate new updates. If the vehicle has received new files during the day, these will be used instead of the old ones. The C57 automatically returns to sleeping mode as soon as possible.

3.2 Odometer Signal

The odometer signal (for example the C3 signal, 0-8V pulses, unloaded signal) is used for positioning. It should be connected to P1:6. The odometer should provide signals as in the table below.

Type of signal	Frequency$_{min}$ (Hz)	Frequency$_{max}$ (kHz)
Sinus 1 V$_{p-p}$	0,3	1,5
Sinus 5 V$_{p-p}$	0,06	8,7
Square 0-0,5 V*	0	0,95
Square 0-2,5 V*	0	5,1
Square 0-5 V*	0	6,4
Square 3-5 V*	0	2,7

Duty cycle = t/T x 100%
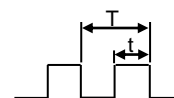
*The duty cycle = 50%, the maximum frequency will be reduced with all other duty cycles.

3.3 Main Switch

The main switch signal should be 24 V when active and open circuit, or GND when not active. The main switch has to be connected to P1:7 if the signal should be used for activating the vehicle computer, when it is in sleeping mode.

3.4 Door Signal

The door signal should be GND when the doors are open. It is usually connected to P1:8.

3.5 Alarm Button

In vehicles with alarm buttons, the alarm signal can be connected to C57, P1:9. The signal should be GND when not active and open circuit when active.

3.6 Stop Signal

The stop signal is usually connected to C57, P1:1, if the unit should control which text to display on an internal sign when stopping. In vehicles with ELSY, the signal is usually connected to an ELSY node. The stop signal should be 24 V when active and open circuit when not active.

3.7 Reset Signal

It is possible to connect a switch to P3:36. When the signal becomes GND the vehicle computer will restart.

4. Outputs

It is possible to state for all vehicle computer outputs when they should be turned on and off, by defining item keywords and setting conditions in the file vehiclemodel.xml (described in the document "Parameter Settings for dv_applications_C74 3.xx'").

The loads connected to the
- **24 V** outputs are not allowed to consume more than **5 A** in total.
- **12 V** outputs are not allowed to consume more than **3 A** in total.

There are
- three 24 V high side switches, 1 A   (P1:2, P1:3, P1:4)
- one 24 V, 2.5 A (P2:6).
- one 12 V, 3 A   (P2:4).
- one 12 V, 3 A   (P3:25). This can be used for camera or video recorder power supply.

- one 5 V, 100 mA (P2:5).
- three 0.5 A, low side switch (P5:6, P5:7, P5:20). They might be used as control signals. As default P5:6 and 7 are used for an external amplifier and a relay.

5.   The Driver User Interface

The C57 unit uses the D57 full colour display with integrated conductive keypad as system user interface.

5.1   Power Supply

The cable, art. no. 14958X-P01 (where X represents different lengths, see table 1, P00 is with both connectors included), should be connected between the C57 and the display for power supply keypad signals.
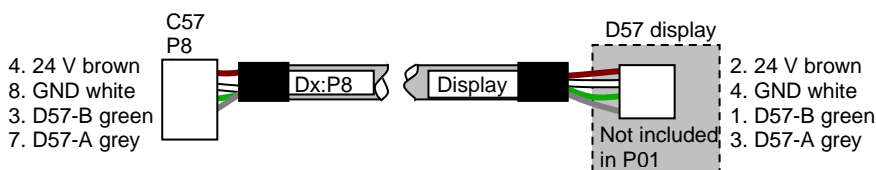
Length (m)	X
4	A
5	B
6	C
7	D
8	E
9	F

C57
P8

4. 24 V brown
8. GND white
3. D57-B green
7. D57-A grey

Dx:P8

Display

D57 display

Not included in P01

2. 24 V brown
4. GND white
1. D57-B green
3. D57-A grey

Table 1.

5.2   FPD-link

Use a standard CAT5e patch cable (straight), art. no. 14526F-P02, length 5 m, between LVDS:C57 (LVDS:RJ45 connector) and the display. If a longer cable is needed, a CAT7 S/STP or S/FTP should be used (e.g. art. no. 14526F-P03, length 7 m, or -P07, length 10 m).

6.   Connecting the WLAN

The WLAN modem is connected to the USB port.

7.   Connecting the GPS/WLAN Antenna

The C57 has embedded GPS. A combination antenna, art. no. 14207M-P00 is used for both GPS and WLAN. The 5 m cables with SMA connectors are included. Connect the GPS antenna cable to the C57 and the WLAN cable to the USB modem connector.

8.   Connecting to CAN J1939 Units/Bus-FMS-Gateway

When connecting C57 to the vehicle's J1939 CAN units/Bus-FMS-Gateway, the cable art. no. 17666X-P01 (where X represents different lengths, see table 2), can be used.

Length (m)	X
1	A
1.5	B
2	C
2.5	D
3	E
3.5	F

Part of P3

art. no. 17666X-P01

7. CAN C H brown
17. CAN C L white

P3 CAN C

FMS

CAN H brown
CAN L white

8. CAN C H brown
18. CAN C L white

To external termination if needed*
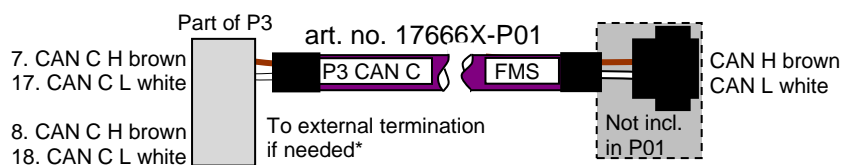
Not incl. in P01

Table 2.

* Termination is needed if the C57 unit is the last or the first unit on the CAN network. If the connection is a cable stub to the main network backbone, the cable length is not allowed to exceed 3 m, see the SAE J1939-15 standard and section 10 for example of different network topologies.

9. Dimensions and Installation

All units shall be installed for convenient connector and service access, at protected locations inside the vehicle's body. The units must never be exposed to water or other fluids, e.g. when washing the inside of a bus. Condensed water shall NOT be able to run along any cable and into a unit. Do NOT locate the units close to sources of heat, e.g. auxiliary heater and hot air units, or their outlets. All units shall be located to places with good ventilation. Mounting instructions of signs are not included.

9.1 C57

Usually the C57 is installed in the storage box above the driver, or in some other location close to the electrical distribution central. Use four M5 screws to fasten the unit.
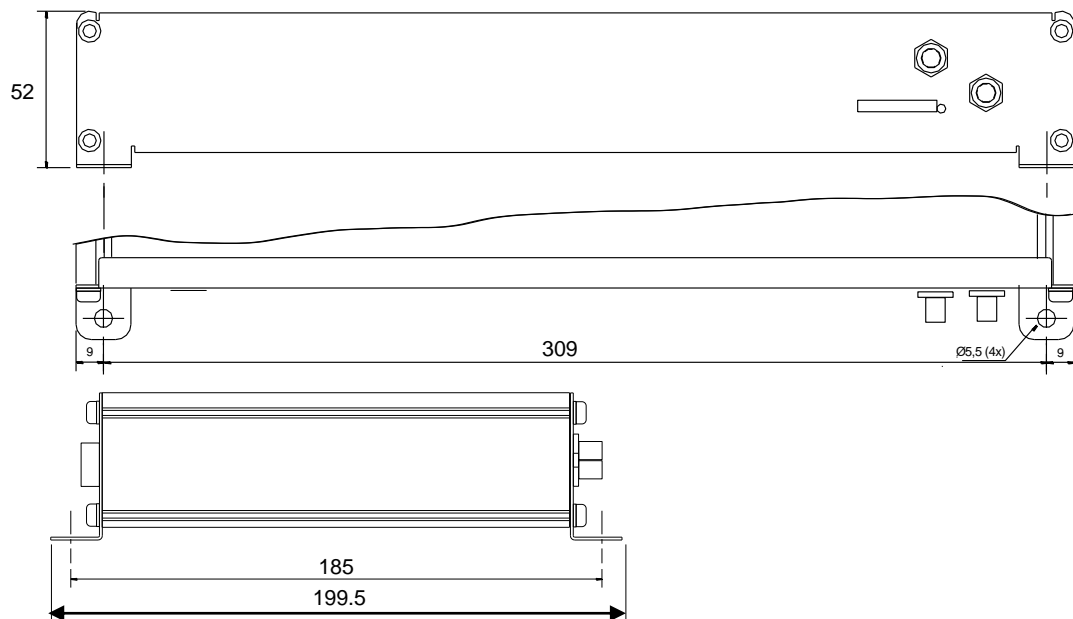
9.2 D57

The display can be installed either flush mounted on the dashboard, or by using the two M5 holes for a bracket (might be supplied by Thoreb as an option).
The display is delivered without the cables connected.
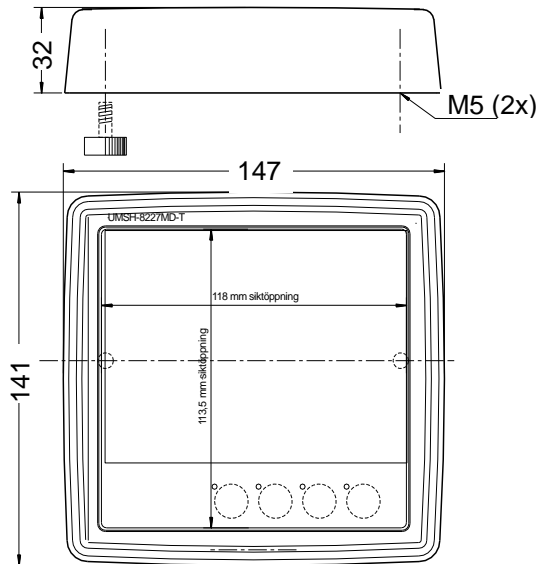
9.2.1 Brackets (optional)

There are several brackets available, each intended for a different bus type. Which one to use can be discussed with Thoreb.

9.2.2 Flush Mounting

The display is delivered without the cables connected.
Do the following:

1. Screw the two M5x30 stud screws (included) to the back of the casing.
2. Make one Ø25 mm and two Ø6 mm holes in the dashboard, for the cables and screws (see the illustration above for measures of where to locate the holes).
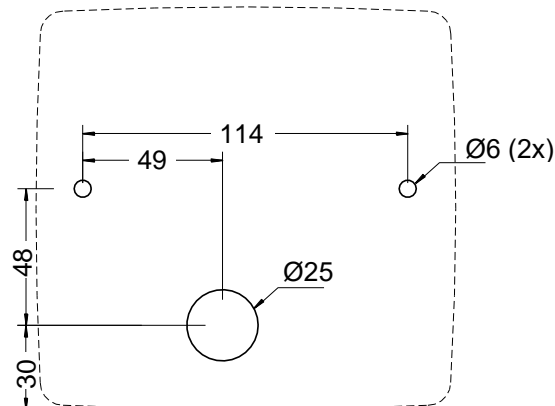
Where to drill the holes in the dashboard

3. Route the cables through the hole and connect the cables to the display.
4. Fasten the display from behind with two M5 wing nuts, art no. 14627A-P00.

9.3 WLAM Modem

Outer dimensions, 70 x 48 x 13 mm

9.4 GPS/WLAN Antenna

The antenna is used for both GPS and WLAN. There are two cables coming from the antenna. Those are labeled close to the connectors with their functionality.

The antenna should be located to the roof, near the front of the vehicle. The antenna should preferably have a GND plane, but can also be installed on plastic or wood. It should be located at least 500 mm from other objects, in particular metallic or overhead objects.
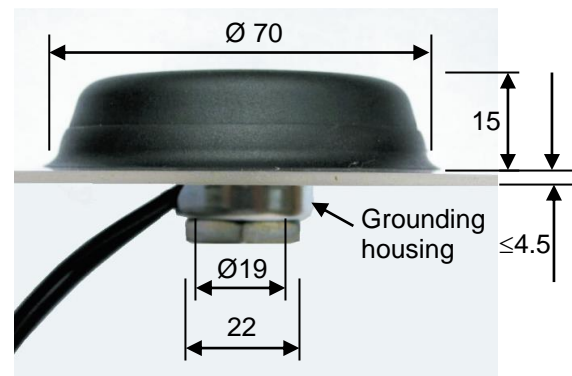
1. Make a Ø19 mm hole in the mounting surface for the antenna.
2. Remove all grease and metallic burrs.
3. Remove the panel nut and the metal cover.
4. Carefully insert the antenna cable and connector through the hole from the top.
5. The antenna stud should be centred in the hole.
6. Ensure that the rubber gasket is tight to the mounting surface, all way around the antenna housing.
7. Place the grounding housing and the panel nut on the thread of the antenna from inside the bus and tighten the panel nut. At the same time, push the antenna gently downwards.
8. Make sure to replace the isolation material underneath the roof, to prevent condense moisture on metal parts, due to temperature differences.

10. CAN Network Topologies

Below are some examples of CAN network topologies, used to illustrate when termination is needed.
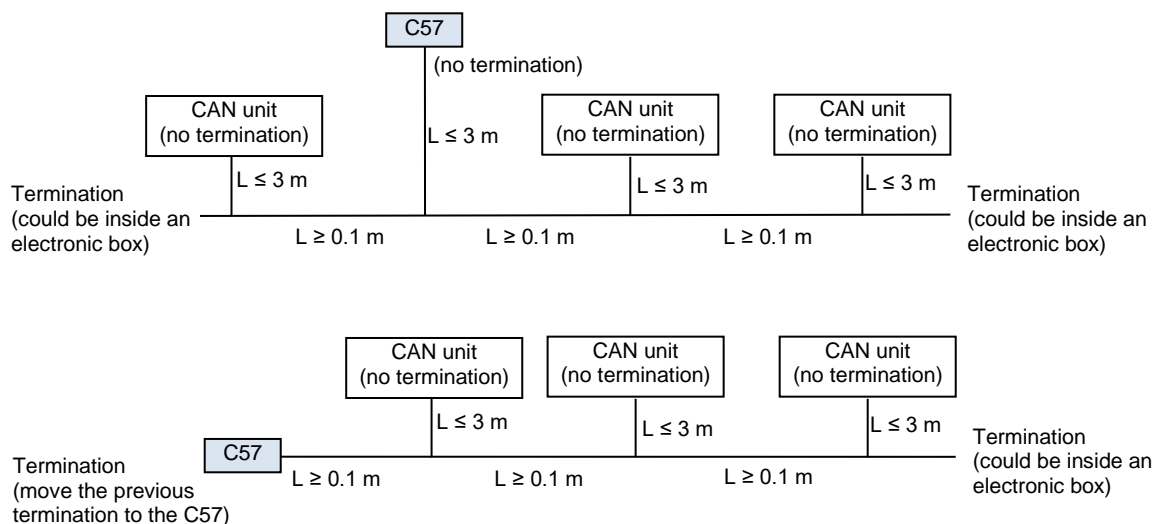
11. Summary of Article Numbers

The following units, cables, connectors and antennae can be used for the installation:

Name	Art. No.
C57 unit	17155A-PYY
Cable for power supply and input signals to C57, L=0.5 m	17158C-P01
Fuse holder for C57 power supply / main switch signal	14512A-P00 (2x)
Fuse 7,5 A	14513D-P00 (2x)
D57 Display 5.7" incl. two M5 stud screws	14946B-PYY
M5 wing nuts	14627A-P00 (2x)
D57 power supply and keypad signals cable, L=x m (see section 5.1), P00= with display connector, P01=without display connector	14938X-P01
Ethernet cable straight, STP cat5e L=5 m	14526F-P02
GPS and WLAN antenna, incl. 5 m antenna cables with connectors	14207M-P00
Comm. cable between C57 and the vehicle's CAN system (channel C), L=X m (see section 8)	17666X-P01
P3 Connector MQS 2x20 pos., without socket housings	14941D-P00
Socket housing MQS 20 pos. grey (pos. 1-20)	14941C-P00
USB extension cable, A connector, female/male L=2 m	14506A-P00
Pin housing WAGO 16 pos.	14261B-P00
DIN rail 3.5 holes	14217E-P00
Socket housing MiniFit Jr 4 pos.	14606D-P00
Socket MiniFit Jr 0,24-0,96 mm²	14607A-P00 (4x)

Table 3.

For information please contact

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Gruvgatan 37	Facsimile +46 31-734 39 10
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SWEDEN	