TMR880i TETRA Mobile Radio

Office Installation Instructions

AIRBUS

TMR880i Vehicle Installation Instructions   TRATRAPP00138-1-1en

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Version	**Date**	**Comments**	**Chapter Updated**
1-1	05/2021	Revised version.	Throughout

1. General information

The Airbus TMR880i TETRA mobile radio conforms to the ETSI standards for compatible digital TETRA networks. It has been targeted to meet the demanding communications requirements of professional mobile radio (PMR) users, from voice communication to messaging and data transmission.

This document instructs how to install the TMR880i to the office configuration desktop kit (DK). There is a separate document, *TMR880i TETRA Mobile Radio: Vehicle Installation Instructions* (TRATRAPP00137), available for instructions on how to install the Vehicle kit in the vehicle environment.

Figure 1. TMR880i TETRA mobile radio

1.1. Contact

For support regarding this installation guide, please contact TETRA Terminal Customer Support via the Airbus SLC Customer Portal: https://hub.securelandcommunications.com/s/.

2. Technical specifications

The Airbus TMR880i TETRA mobile radio fulfils the following specifications for TETRA radio equipment in the temperature range -20 to +55°C:

- ETS 300 392-2 Voice and Data Air Interface,
- ETS 300 394 Voice and Data Conformance testing
- ETS 300 395 V + D Air Interface.

Table 1. Technical specifications

Functionality	Description
Operation mode	Trunked mode (TMO, duplex and semi-duplex) and Direct mode (DMO, simplex)
Frequency Band	RC9: TMO TX 380-390 and 410-420 MHz TMO RX 390-400 and 420-430 MHz DMO TX & RX 380-400 and 410-430 MHz
	RC16: TMO TX 806-825 MHz TMO RX 851-870 MHz DMO TX & RX 806-825 and RX 851-870 MHz
Output power	ETS 300 392-3 compliant power class 3
Receiver class	Class A
Durability	Control unit CUR-3 is water and dust resistant (IP55 classification).
Operating voltage	from 10.8 V to 15.6 V DC (min. voltage 6.0V in non-operation mode)
Dimensions & weight	**Control unit:** Length x Height: 190 x 72 mm Thickness: 26 mm (36 mm with rotary switch) Weight: 240 g
	Radio unit: L x H x W: 182 x 60 x 125 mm Weight: 1004 g
Interfaces	External control unit 16 configurable I/O pins (e.g. External alarm) Multiple audio devices Programming through Hirose connector in system - cable CA-105 Serial data, via external data cable DLR-3T NMEA output External power on/off External PTT External emergency PTT Ignition sense
Display	2,6inch Illuminated high-contrast full graphics color display 65,536 colors, 130 x 130 pixels
Keypad	Alphanumeric keypad, Power On key, selection keys, 4-way navigation keys, volume keys, Red Function key, Duty key, Fast Menu key, Group selector, Back key, Display brightness key
Current consumption	RX idle average 600 mA (CUR-3 lights on, GPS on, audio on) TX average 1.4 A (CUR-3 lights on, GPS on) Power supply requirement 8 A
Power supply	The ACR-7 power supply input voltage can vary between 100-240V AC The output voltage is 12V DC and max current is 10A

3. Sales packages for TMR880i

The TMR880i office configuration desktop kit enables easy operation of the radio on the desk. It is transportable, so it can be moved to a new location for example when cleaning the desk. It contains a desktop kit (DK) chassis, a compact black box, in which the radio transceiver and power supply 240V AC / 12V DC cabling can be packed easily together with the included mounting accessories. On the top of the DK chassis, there is a place for a separate, highly ergonomic CUR-3 control unit, optimised for easy and reliable use in the office. It is mounted on the top using a HHR-1 Swivel. The basic configuration includes a speaker microphone MPR-4 and loudspeaker HFS-10, which can be mounted outside the DK chassis

There are two alternative ways to set up the office configuration with the existing sales packages. These options are presented in more detail below.

3.1. Sales package Option 1

Customer-specific radio sales package, which includes a RC-9 (380-430MHz) or RC-16 (800MHz) radio unit. It can be complemented with the DK-LE or DK-AX sales package, which includes CUR-3, power supply, and DK chassis. ((DK-LE includes a Latin keypad, CUR-3 and EU-plug power supply, while AX includes an Arabic keypad and UK plug). The Control Unit sales package is generic for all customers.)

The CUR-3 Control Unit is available in 5 different keymat variants: Latin, Arabic, Chinese, Korean and Greek.

The contents of the DK-AX and DK-LE sales packages are listed here as reference.

Sales code	Sales package	Description
HT8524AA	DK-AX DESKTOP KIT TMR880I	Mechanical desktop Kit Assembly HHR-1 Swivel ACR-7UK POWER DYS6150 100-240V 10A 12V MPR-4 Speaker Microphone HFS-10 Speaker Molex Connector CUR-3 Control Unit (Arabic Keypad) For Desktop Kit CA-116 INST CABLE CUR-3 0.75M CA-157 ADAPTER RJ-50 FOR MPR-4
HT8525AA	DK-LE DESKTOP KIT TMR880I	Mechanical desktop Kit Assembly HHR-1 Swivel ACR-7EU POWER DYS6150 100-240V 10A 12V MPR-4 Speaker Microphone HFS-10 Speaker Molex Connector CUR-3 Control Unit (Latin Keypad) For Desktop Kit CA-116 INST CABLE CUR-3 0.75M CA-157 ADAPTER RJ-50 FOR MPR-4

3.2. Sales package Option 2

Customer-specific radio sales package, which includes a RC-9 (380-430MHz) or RC-16 (800MHz) radio unit. It can be complemented with the CUR-3 Control Unit sales package, which contains a CUR-3 control unit with installation cable and an optional selection of speaker microphone cable, speaker microphone, loudspeaker, installation swivel HHR-1, hands-free PTT and a hands-free microphone. The benefit of this second sales package option is that is has fewer configurations if you are also managing vehicle installations.

This configuration is simply a DK package, which contains DK chassis and power supply (DK-UK or DK-EU power supply socket variants).

Sales code	Sales package	Description
HT12040AA	DK-EU DESKTOP KIT TMR880I	MECH. DESKTOP KIT TMR ASSEMBLY
		ACR-7EU POWER DYS6150 100-240V 10A 12V
HT12041AA	DK-UK DESKTOP KIT TMR880I	MECH. DESKTOP KIT TMR ASSEMBLY
		ACR-7UK POWER DYS6150 100-240V 10A 12V

3.3. Radio sales package

A typical customer radio sales package contains a transceiver unit, system cable CA-105 or CA-156, installation plate and screws, as well as 1-3 Quick Guides.

Note that the use with the office desktop kit requires a radio kit with CA-105, which enables the use of external audio accessories, and is the preferred choice.

3.4. Operation without CUR-3 from a tablet or PC

The TMR880i office configuration product can be integrated to a bigger user GUI, such as a tablet or PC. These kind of configurations are customised base on the customer needs.

This solution can be based on the sales package options 1 or 2, with or even without CUR-3. The same audio accessories as with CUR-3 are used as audio devices, a speaker microphone MPR-4 as well loudspeaker HFS-10, which can be mounted outside the DK chassis. The audio lines can also be connected to external 3rd party integrated audio solutions, such as control rooms.

4.Optional external audio accessories

Thanks to a variety of installation options, versatile interfaces and I/O lines, the TMR880i is perfectly suited to diverse applications.

Airbus has a wide selection of optional compliant audio accessories which help build a solution for various office needs, such as a HF kit (wired small microphone HFR-1 and separate small PTT-1), a Handset HSU-6, or a Gooseneck microphone with PTT DGM-1. The HFS-11 is an alternative 15W external loudspeaker for HFS-10

Note that the size of the DK office installation mechanics is compact. The size may be limited for some bigger audio accessories. The use case and usability aspects must be considered carefully before the installation.

4.1. Optional Data accessories

The office solutions typically include a tablet or PC. TMR880i can be connected to the data device using the optional DLR-3T data cable (DLR-3T Data cable RS232). This interface enables remote control by using the AT commands, while the user interface can be integrated as a part of the smart device or PC applications

.

5. Accessories for office installation

TMR880i has the following accessories available. Note that some of the accessories may not be available in all countries. Check the availability from your local distributor.

Check your warranty terms before connecting other than those Airbus own accessories.

TMR880i can be assembled in a vehicle. The installation manual of the vehicle kit and its related accessories are available in a separate document, *TMR880i TETRA Mobile Radio: Vehicle Installation Instructions* (TRATRAPP00137).

Table 2. Accessory reference list

Accessory	Type	Code
Speaker microphone	MPR-4	HR9205AA
Speaker microphone cable used with MPR-4	CA-157	HG5469A
HF microphone	HFR-1	HR10162AA
Loudspeaker 3W with Molex connector	HFS-10	T0692006
Optional Loudspeaker 15W with Molex connector	HFS-11	HR10900AA
Push-to-Talk switch (old code 9780282)	PTT-1	HR10911AA
Optional Handset	HSU-6	HR10749AA
Optional Gooseneck microphone with PTT	DGM-1	HR10750AA
Data cable	DLR-3T	T0730227
AC Power Supply	ACR-7EU, Eu Plug	HR10811AA
AC Power Supply	ACR-7UK, UK Plug	HR10812AA
AC Power Supply	ACR-7US, US Plug	HR10813AA
Swivel mount	HHR-1	T0620064
System cable	CA-105	HG5397A
System cable	CA-156	HG5467A
Installation cable, 0,75m	CA-116	HG5178B
Installation cable, 1.5m	CA-108	HG5178A
Installation cable, 5.5m	CA-103	T0730625
Helmet cable	CA-106	T0730632
Magnet base antenna kit TETRA + GNSS	AN-60	HR10270AA
Smart card reader	DD-5	T0632189
Fuse 5A 125°C rated	N/A	PK1705A
Installation plate	N/A	9500318

5.1. Handset (HSU-6)

Figure 2. Handset HSU-6 (left) and phased-out model HSU-1T (right)

In the following figure, the handset is connected to the system cable CA-105, and can be used. Check the Taqto parameter settings to support the more flat audio profile made for HSU-6.
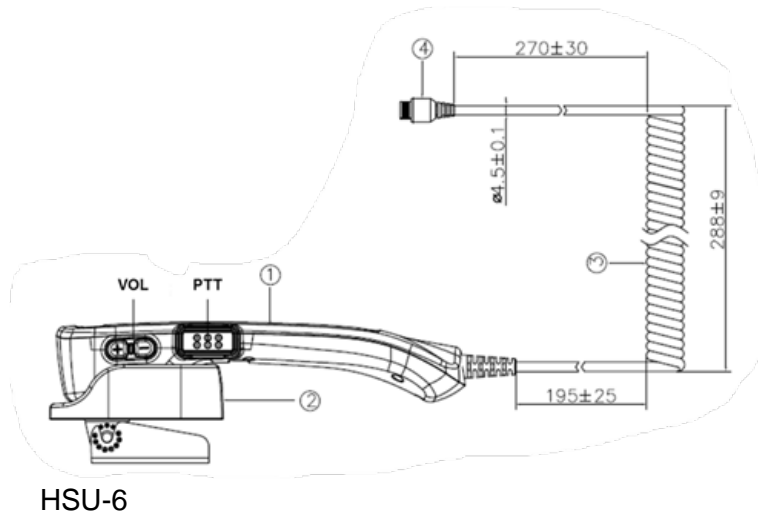
HSU-6

Figure 3. Connected handset HSU-6

5.2. Handsfree microphone (HFR-1)

The handsfree HFR-1 microphone is connected to the system cable CA-105 with a 3.5mm jack. The direction and distance to the user should not exceed 40 cm. Avoid wind noise positions and the vicinity of parallel-running high current paths in the vehicle.

When installing the Audio HF-Mic Jack connector, add 1.5 round of electronics tape to cover the connectors to avoid the connection becoming loose when the vehicle vibrates.

Figure 4. Handsfree microphone HFR-1

5.3. Handsfree push-to-talk button (PTT-1)

The handsfree push-to-talk button HF PTT-1 with 1 m cable is connected to the system cable CA-105. The cable distance to the user should be optimised for ergonomics, so that it is not disturbing or preventing the use of the vehicle's own controls.

Figure 5. Handsfree push to talk button PTT-1

5.4. Data cable (DLR-3T)

Figure 6. Data cable DLR-3T

5.5. Antenna (AN-60)

Vehicle combination antennas of 380-400MHz, TETRA and GNSS.

The antenna datasheets for vehicle antenna models are available separately from the Accessory Catalogue (https://www.securelandcommunications.com/tetra-radio-accessories). Note that the office antennas are not included in Airbus offering. They are available from value-added resellers (VARs) or directly from the antenna manufacturers.

5.6. CUR-3 installation cables

Table 3. CUR-3 installation cables

Description	Cable	Sales code	Note
Installation cable, 0.75m	CA-116	HG5178B	
Installation cable, 1.5m	CA-108	HG5178A	
Installation cable, 5.5m	CA-103	T0730625	
Installation cable, 10m	CA-104	T0730627	The CA-104 cable is too long to be installed inside the DK mechanics.

Figure 7. CUR-3 installation cables

5.7. Power supply (ACR-7E, ACR-7U, ACR-7X) for office use

The ACR-7 power supply is on the left. The previous model ACR-1E, ACR-1U, ACR-1X, which has been phased out in 2021, on the right. For more details on ACR-7, see the datasheet of ACR-7.

Figure 8. Power supply for office use ACR-7 (left) and ACR-1 (right)

5.8. Speaker microphone (MPR-4)

MPR-4 is optionally included in the CUR-3 sales package. Check the status from your sales contact.

Figure 9. Speaker microphone MPR-4 (left) and phased-out MPR-1 (right)

5.9. Loudspeaker (HFS-10)

The HFS-10 loudspeaker is part of some CUR-3 sales packages. It has a 2-pin Molex type connector, which is connected to system cable CA-105's external audio interface. Its maximum audio power is 3W.

Figure 10. Loudspeaker HFS-10

5.10.   Loudspeaker 15W (HFS-11)

The optional HFS-11 loudspeaker has a 2-pin Molex type connector, which is connected to the system cable CA-105's external audio interface. Its rated audio power is 15W and the maximum is 20W.

Figure 11. Loudspeaker HFS-11

5.11. Desktop Gooseneck microphone DGM-1
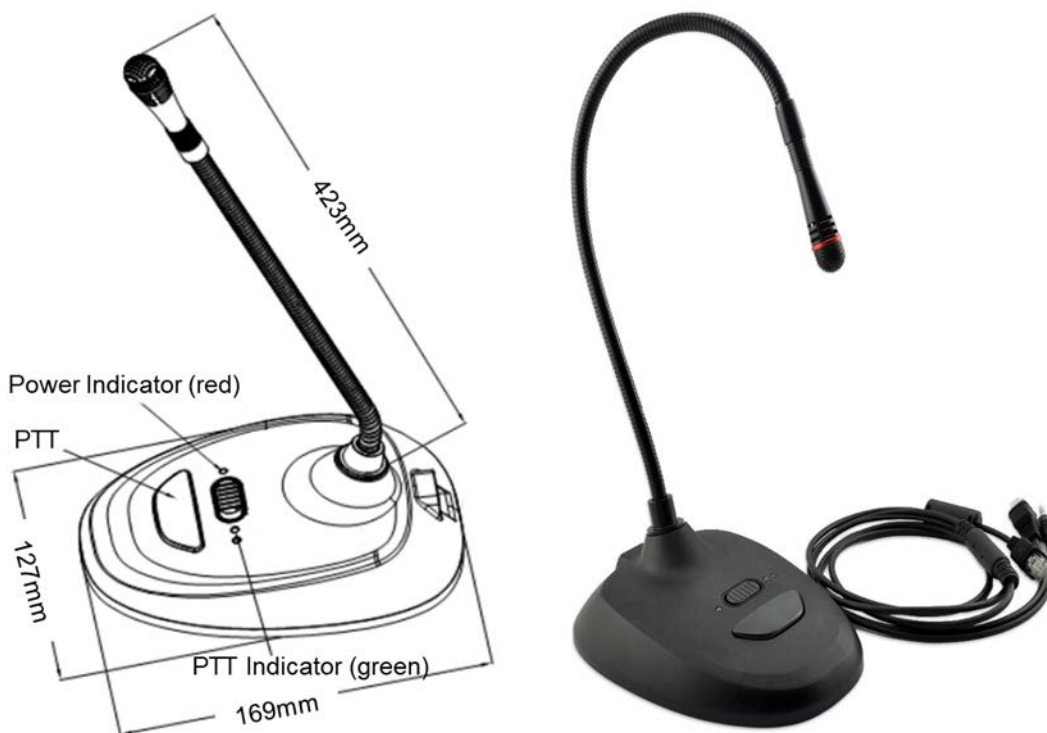
Figure 12. Gooseneck microphone DGM-1

DGM-1 is a sensitive microphone with a flexible gooseneck. The microphone's base is strong and stays on the table firmly. It also has a big push-to-talk (PTT) button.

The PTT operation can be selected between two modes:
 a) Push-to-talk mode
 b) Toggle mode to activate and deactivate the PTT.

The base has LED indicators for when the power is on and when the PTT is active.

DGM-1 is connected to the radio system cable's external handset connector and HF kit's microphone jack

No external power supply is required. DGM-1 takes its power from the radio.

5.12.　Swivel mount (HHR-1) for Control unit CUR-3

Figure 13. Swivel mount for CUR-3

5.13.　Other parts

5.13.1.　Installation plate

Figure 14. Installation plate

5.13.2. Fuse 5A 125°C rated

The power cable CA-156 and CA-105 + cable (red) includes a fuse holder. Use a 5A fuse.

The power cable has another wire with a fuse, which is for IGN control. The IGN input line fuse is 1A. For more information, see chapter 8.2.2.
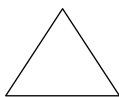
⚠️ **CAUTION**

Always use only the right size fuse. Never remove the fuse by bypassing it or by replacing it with a higher Ampere value fuse!

Figure 15. Fuse

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6.Connectors and PIN layouts

6.1. Connectors in the back-front

Figure 16. Back-front connectors

1. System Connector

2. Control Unit Interface Connector

   Installation cables   from 0.75m to 10m
   Overall diameter: 8.3±0.2 mm
   Minimum bending radius: 5 x D

3. Auxiliary Accessory Connector (I/O Pins)

4. TETRA Antenna Connector

⚠ **CAUTION**

Never short circuit the CA-105 cable and Control unit cable! It will damage the CUR-3.

⚠ **CAUTION**

Both the control unit and auxiliary connectors are DB-26 female. Make sure that you connect the CUR-3 cable to the connector 2, otherwise the I/O can be damaged and the radio must be sent to the repair service.

6.2. Connectors in the front panel

Figure 17. Front panel connectors

5. GPS Antenna Connector

6. External Smart Card Connector

7. Integrated Smart Card Connector

6.3. Connectors in CUR-3

In addition to the connectors listed in the previous chapters, CUR-3 also has the following connectors:

- Speaker microphone connector
- Helmet cable connector
  Overall diameter: 5.9±0.2 mm
  Minimum bending radius: 5 x D

See chapters 7.3.1 and 7.3.2 for placements of the speaker microphone and helmet cable connectors.

All optional accessories that are connected to the CUR-3 control unit must be electromagnetic compatibility (EMC) tested before use.

Note

Do not connect or disconnect the cables or Smart Cards while the radio is powered on.
Always power off the device before making any maintenance or installation work.

Ensure also that the accessories are powered off, including data accessories connected to the data cable, before you power on the TMR880i.

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6.4. Audio accessory use

Different audio accessories can be connected to TMR880i:

- Speaker microphone (MPR-4)
- Handset (HSU-6)
- Gooseneck microphone (DGM-1)
- Handsfree (PTT-1, HFS-10, HFR-1)
- High power loudspeaker (HFS-11)
- Additional audio through the auxiliary interface
- Helmet interface in CUR-3.

Recognition:

- Speaker microphone and handsfree accessories are automatically detected.
- Handset and auxiliary accessory connector need the HS_HOOK signal to activate the audio path.

Simultaneous use:

- Speaker microphone and handsfree can be used simultaneously.
- When you take off the handset, the MPR-4 and handsfree are muted.

6.5. Speaker microphone cable and connector options

6.5.1. Speaker microphone (MPR-4)

The MPR-4 acts as microphone and speaker.

The speaker microphone cable is used to provide a connection from the MPR-4 speaker microphone to the adapter cable CA-157. The adapter cable is connected to the PWB connector in CUR-3 via an opening in the back cover. The opening is sealed and protected by a cable clamp. If the cable is not installed, the opening in CUR-3 must be protected by a gum plug.

The speaker microphone adapter cable CA-157 is replaceable, too, but in field use you normally need to swap just the MPR-4 part.
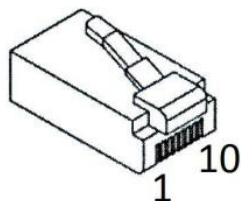
Figure 18. MPR-4 connector

Table 4. Technical data of the MPR-4 connector

10P10C pins	Signal	Parameter	IN/OUT	Min.	Typ.	Max.	Unit	Notes
10	SPM_PTT	Speaker -micPTT	IN	0	0 1.8	0.1	VDC VDC	PTT pushed PTT released
9	GND			0	0	0.1	VDC	
7	SPM_SPK-	Speaker -micLSP-	OUT			4	Vpp	
8	SPM_SPK+	Speaker -micLSP+	OUT			4	Vpp	
1	SPM_MIC-	Speaker-mic microphone	IN		2.1		VDC	DC level
3	SPM_MIC+	Speaker-mic microphone						

Note that the speaker microphone MPR-4's connector must be locked with a clamp (included in MPR-4 delivery) or similar to protect the RJ-45 cable's connector when you need to operate the speaker microphone from a longer distance.

Figure 19. Speakermic MPR-4 connector

6.6. System cable connector

The system cable connector is a male 26-pin high density D connector which makes all the main connections. These include the power feed, HF equipment; PTT, microphone, loudspeaker, and handset / data interface's external data cable DLR-3T connection.

The system connector's data interface is used for the data applications with DLR-3T data cable, which is an external accessory. The programming interface (DAU-9H) in the system cable connector cannot be used simultaneously with the peripheral equipment interface (PEI) (DLR-3T).
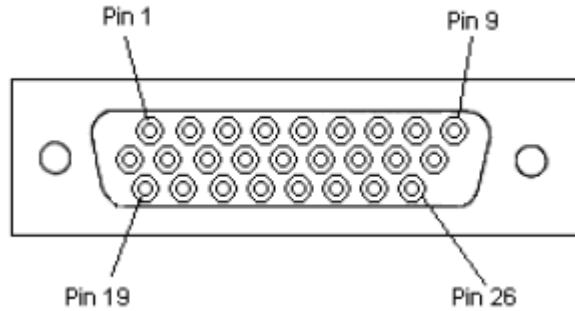
Figure 20. Face view of 26-pin high density D connector (radio part) X1

Table 5. System cable connector

Pin	Signal	Parameter	IN/OUT	Min.	Typ.	Max.	Unit	Notes
1, 2, 3	CARBAT+	The external supply voltage	IN	10.8	13.2	15.6 6	V A	
4	EXT_EMERGENCY	External Emergency PTT button	IN	0	0 5	0.1	VDC VDC	Signal active Stand by. State change by driving low only (open collector).
5	+10V	Supply voltage for the data cable DLR-3T and handset HSU-1T	OUT	9.5	10 11	10.55 200	VDC mADC	
6	Data	N/A						
7	Data	N/A						
8	HS_MIC	Handset microphone input	IN		60 5	500 2	Ω mVrms Vpp VDC	Source impedance for driver. Signal level Maximum signal level DC level if DLR-3T connected
9	AGND	HS_MIC ground			0	0.1	VDC	Connected to cable shields of HS_EAR and HS_MIC.

Pin	Signal	Parameter	IN/OUT	Min.	Typ.	Max.	Unit	Notes
10	CARBAT-	External supply voltage ground	IN					Combined with line 19
11	Data	N/A	IN					
12	GPS_TX	RS-232 level TX line for NMEA output	OUT	+/-5	+/-8		V	Voltage swing
13	Data	N/A	IN					
14	HS_PTT	PTT button for Handset and HF	IN	9.5	0 10	1 10.55	VDC VDC	PTT-standby / low state PTT pushed / high state
15	Data	N/A						
16	HS_HOOK	Handset Hook recognition	IN	0 5.1		0.8 5.24 10	VDC VDC kΩ	Hook on/audio off/ Low state Hook off/audio on/ High state/ pull-down in TMR
17	GND			0	0	0.1	VDC	
18	HS_EAR	Handset earphone output	OUT	10	35 10	2.1	mVrms Vpp µF kΩ	signal level signal level series output capacitance HS load impedance to gnd
19	CARBAT-	External supply voltage ground	IN					Combined with line 10
20	IGS	Ignition sense line, Recognises the car start	IN		12		VDC	Fuse included on the cable line.
21	Data							
22	Data							
23	HF_MIC+	Hands Free device microphone input	IN		2.1 60		V mVrms	DC voltage level, Bias supplied by TMR880i Nom. 2k ohm
24	HF_MIC-	Hands Free device microphone input	IN		0			
25	SPK+	Hands Free device loudspeaker output	OUT			10	Vpp	Min 4 ohm
26	SPK-	Hands Free device loudspeaker output	OUT			10	Vpp	Min 4 ohm

Technical data of the CA-105/156 system connector interface (X1)

Notes to table 4:

1) The `IGS` command is associated with a timer. This line can be used from the 12V voltage controlled by vehicles ignition key. Once vehicle is switched off, there is user request to continue radio operation; otherwise radio will also be switched off as IGS line gets down.
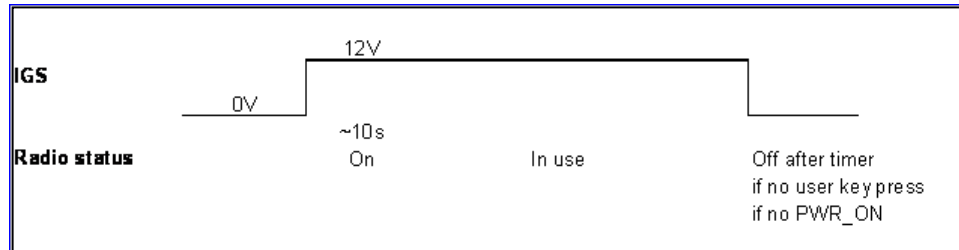
Figure 21. CA-105/156 system connector interface

2) Interfacing to the handset interface (HS_PTT, HS_HOOK, HS_MIC+, HS_EAR, AGND) can be used for line in/out in certain call types specific to the handset. This requires a low impedance buffer to drive the HS_MIC+ line to utilize the full available audio bandwidth. A DC block (series capacitor) is required on HS_MIC+ to prevent the driver from deviating the associated DC bias level while the data cable DLR-3T is connected, and to protect the driver from injection of DC.

The HS_EAR signal also needs to be buffered to drive a speaker. Also filter the 20 kHz side tone from the earphone output line.

HS_HOOK is used to enable this interface. See chapters 5.1 and 6.4 for the behavioral descriptions. The HS_HOOK signal may be left floating or driven to low state if the HS_PTT signal is used for controlling the HF interface instead of the HS interface. Note the HS_PTT polarity in both cases is "active high".

Technical data of the CA-105 power cable interface

The CA-156 cable has a similar connection. The difference is pin 4 external emergency, which is not supported / connected.

Table 6. CA-105 power cable interface

Pin at X1	Line Symbol	Cable colour	Cable thickness
1, 2, 3	CARBAT+	Red	3 x AWG22 combined to AWG13
10, 19	CARBAT-	Black	3 x AWG22 combined to AWG13
4	EXT_EMERGENCY	Blue	AWG22
20	IGS	Red	AWG22

CA-105 System Cable

Connector 7 not in use, not included in latest CA-105 delivery

CA-156 System Cable

X2

Female 10pin connector for handset, K1-keying

Female 10pin connector for datacable, K2-keying
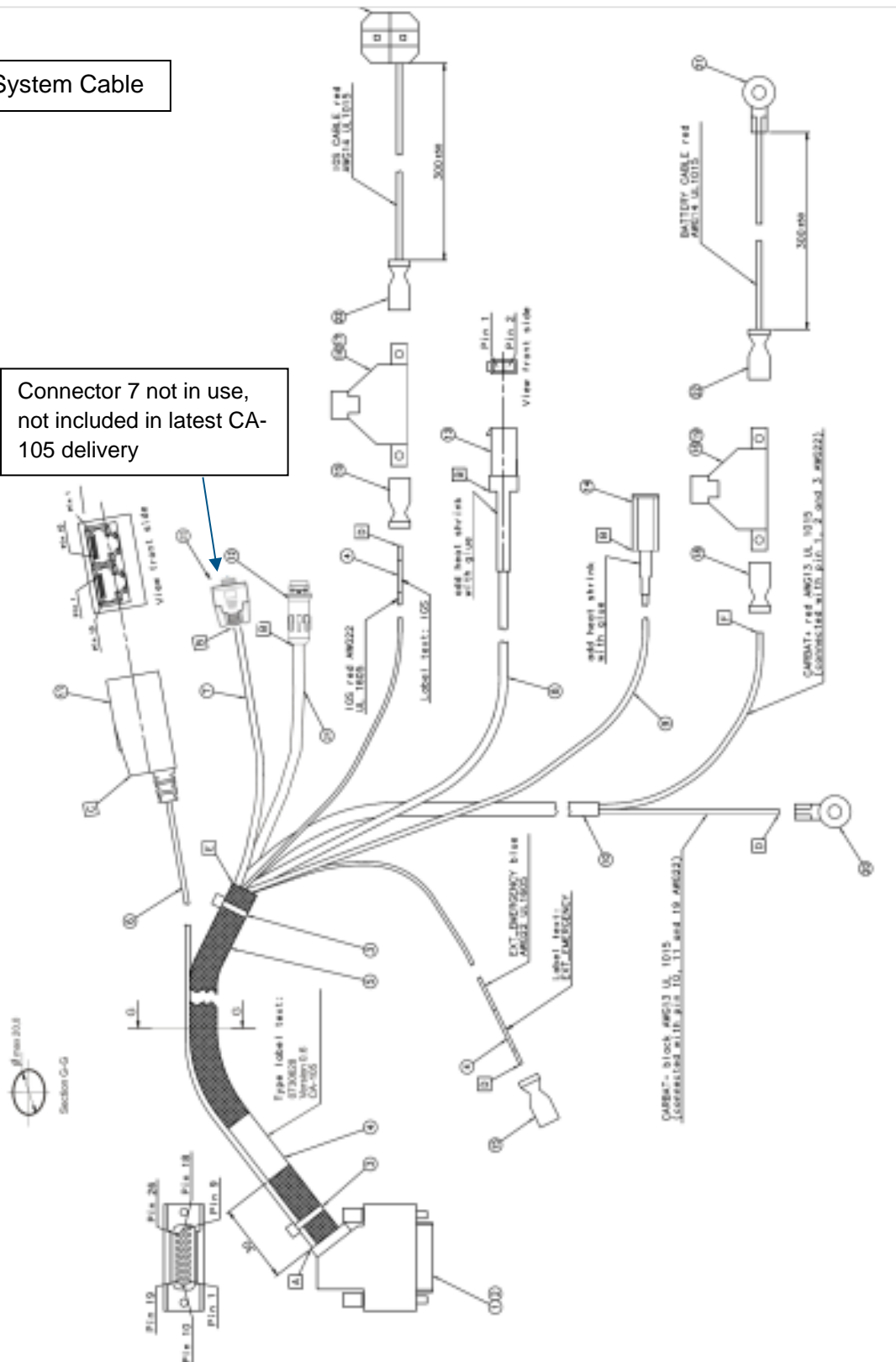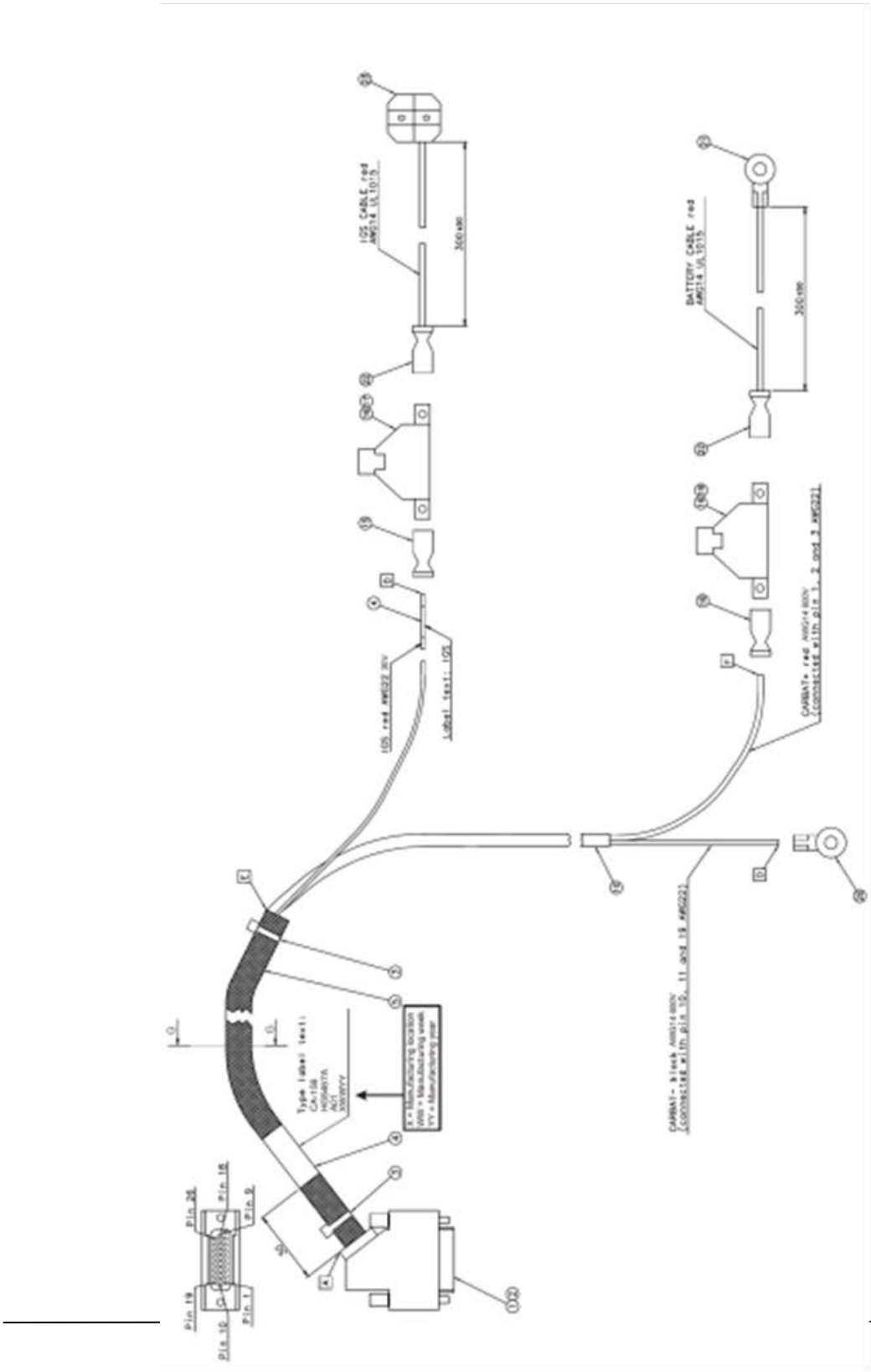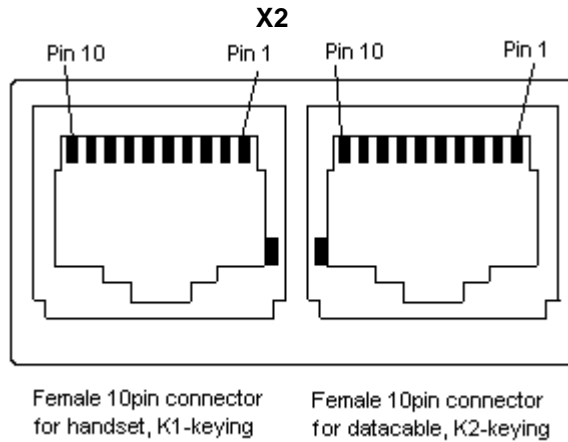
Figure 22. Face-view of integrated DTC-1 (X2)

When there is a need to connect 3rd party audio devices to the TMR880i or to integrate the TMR880i to the office intercom solution, use the Handset interface connector X2 for the audio integration.

Table 7. Connections in X100 (handset connector in X2)

Pin	Line Symbol	Parameter	Min	Typical/ nominal	Max	Unit / Notes
1	PTT	PTT activation to TMR	9.5	0 10	1 10.55	VDC (PTT-standby / low state) VDC (PTT pushed / high state)
2	+10V	DC voltage	9.5	10	10.55	VDC
3	NC					
4	NC					
5	HS_HOOK	Handset hook	0 8.5	4.3 1	0.8 8.7	VDC Low state VDC High state kΩ / pulldown in acc. kΩ / EMI res. in acc.
6	NC					
7	NC					
8	HS_MIC	Audio from handset to TMR	1.0	100 60 5	1.2 500 2	kΩ / input AC impedance Ω / handset source imp. Ω / maximum source imp MVrms / signal level Vpp / maximum signal level VDC / when DLR-3T connected.
9	HS_EAR	Audio output from TMR		35 47 10 10 1.0	2.1	mVrms Ω / output AC impedance µF / series output capacitance

| | | | | | | kΩ / load to acc. Ground
Vpp / maximum output level |
| 10 | AGND | Analog ground | | 0 | 0.1 | VDC |

For a detailed description of the handset (HS) interface signals, refer to chapter 6.6, note 2).

Table 8. Connections in X200 (data cable connection in X2)

Pin	Line Symbol	Parameter	Mini-mum	Typical/ nominal	Maxi-mum	Unit / Notes
1	PTT	PTT activation to TMR	9.5	0 10	1 10.55	VDC (PTT-standby / low state) VDC (PTT pushed / high state)
2	+10V	DC voltage DC current	9.5	10	10.55	VDC mADC
3	FBUS_RX	Serial data to phone	0 1.7		0.8 2.9	VDC Low state VDC High state
4	MBUS	MBUS bi-directional serial bus	0 1.7		0.8 2.9	VDC Low state VDC High state
5	NC					
6	FBUS_TX	Serial data from phone	0 1.7		0.8 2.9	VDC Low state VDC High state
7	GND	Logic ground	0	0	0.1	VDC
8	HS_MIC	Audio from handset to TMR	2.0	100 60 5	2.2 2	kΩ / input AC impedance Ω / handset source imp. mVrms / signal level Vpp / maximum signal level VDC level
9	NC					
10	AGND	Analog ground		0	0.1	VDC

6.7. Control unit interface connector

The CUR-3 connector provides an interface for the external control unit. The connector is a female 26-pin high density D connector. The display data bus parallel to the TMR880i's display controls and serial data interface are converted to RS-485 level. The connector includes also an audio interface and a voltages supply for the control unit.
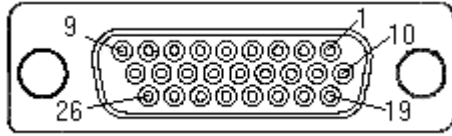
Figure 23. Face view of 26-pin high density D connector (radio part)

Table 9. Control unit interface connector

Pin	Signal	Parameter	IN/OUT	Min.	Typ.	Max.	Unit	Notes
1	/LCD_RES	Display Reset	OUT	2.3		0.7	V V	Logic low Logic high
2	/SCE+	Display Chip Select, RS-485	OUT		2.5	3	V	Driver common mode output voltage
3	/SCE-	Display Chip Select, RS-485	OUT		2.5	3	V	Driver common mode output voltage
4	SDATA+	Display Serial data, RS-485	OUT		2.5	3	V	Driver common mode output voltage
5	SDATA-	Display Serial data, RS-485	OUT		2.5	3	V	Driver common mode output voltage
6	SCLK+	Display Serial clock, RS-485	OUT		2.5	3	V	Driver common mode output voltage
7	SCLK-	Display Serial clock, RS-485	OUT		2.5	3	V	Driver common mode output voltage
8	CU_TXD+	Ext. CU control data from TMR880i, RS-485	OUT		2.5	3	V	Driver common mode output voltage
9	CU_TXD-	Ext. CU control data fromTMR880i, RS-485 data	OUT		2.5	3	V	Driver common mode output voltage
10	GND							
11	CU_RXD+	Ext. CU control data to TMR880i, RS-485	IN	-7		+12	V	Common mode voltage limits
12	CU_RXD-	Ext. CU control data to TMR880i, RS-485	IN	-7		+12	V	Common mode voltage limits
13								
14	VB	+12V output from car battery voltage	OUT					

No.	Signal	Function	Dir	Min	Typ	Max	Unit	Notes
15	PWR_ON_CU	PWR button from ext. CU	IN		2,1	0.7	V V	Logic low Logic high [1]
16	CU_PTT	PTT button from Ext. CU	IN	-0.5 2.0		0.8 5.5	V V	Logic low Logic high
17	CU_REG_CTRL	Ext. CU voltage regulator control	OUT	 4.0	 5	0.8	V V	Logic low Logic high
18,19	GND							
20	EXT_MIC+	Ext. CU microphone, Connected to HS mic input using an analogue MUX	IN		0.5		Vrms	Signal level
21	EXT_MIC-	Ext. CU microphone ground	IN		0		V	
22	GND							
23	EAR+	Audio to Ext. CU	OUT			4	Vpp	Connected to audio PA
24	EAR-	Audio to Ext. CU	OUT			4	Vpp	Connected to audio PA
25	VB	Car battery voltage	OUT	10.8	13.2	15.6	V	Supply voltage to the Ext. CU
26	CARBAT-	Car battery ground	OUT		0			

[1] When CUR-3 is connected, the level is 2.1 V at VBAT 13.2 V. (There is 4k7 in this line in CUR-3, and 1k0 to GND inside radio.)

6.8. I/O Auxiliary Accessory Connector

This connector offers an interface for different auxiliary accessories such as status panel, different external function buttons, and parallel functions to the front panel buttons. The connector is a female 26-pin high density D connector. Inputs or outputs of GEN_IO pins in the interface can be programmed to match the needed connections by using parametering SW.

Airbus does not have a ready-made cable for this interface, because the connector is widely available commercially.

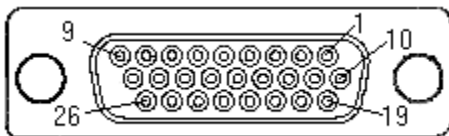The I/0 Pin operation is configured using the Taqto tool.

Figure 24. Face view of 26-pin high density D connector (radio part)

Table 10. I/O Auxiliary Accessory Connector

Pin	Signal	Parameter	IN/OUT	Min.	Typ.	Max.	Unit	Notes
1-9, 11-17	GEN_IO	Programmable I/O	IN/OUT	-0.5 2.0 4.0		0.8 5.5	V V V	Low level input High level input High level output **Maximum 8 mA** [1]
10	EXT_ALARM	External alarm control	OUT					Open collector/ drain output **Maximum 0.5 A** [2]
18, 19	GND							
20	HS_MIC+	Audio input, connected to HS microphone input	IN			0.2	Vrms	Activated by HS_HOOK [3]
21	HS_MIC-	Audio input, HS mic signal ground	IN		0		V	
22	LINE_OUT	Audio output, connected to HS ear output	OUT			0.2	Vrms	Activated by HS_HOOK [3]
23	PWR_ON	External power-on switch	IN	0	0	0.1	VDC	PWR_ON active PWR_ON inactive open (pull-up resistor in phone) [4]
24	GND							
25	EXT_VOUT2	+12V output	OUT	10.8	13.2	15.5	V	Filtered from car battery voltage **Maximum 0.5 A**
26	GND							

[1] **PINS 1-9, and 11-17 Programmable (with TAQTO Software) I/O** Pins, are 5V logic outputs / inputs. **Maximum current is about 8mA**. External "amplifier" (transistor) needed to control relay.

[2] **PIN 10 EXT Alarm** is named the "open collector" – output. **Maximum current is 0.5A** (Internal diode installed).

[3] **HS_HOOK** is the handset hook recognition (see §4.1 PIN 16 of system connector).

[4] **PWR_ON** should stay open during inactive phase and should be grounded during active phase:
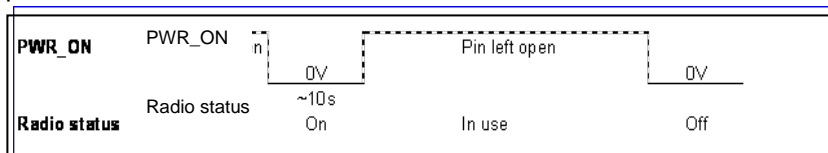
Figure 25. Face view of 26-pin high density D connector (radio part)

6.9. External Smart Card Connector

This connector offers the interface for an external smart card reader (DD-5) through an RJ45 connector. The length of the external smart card reader cable is approximately 1800 mm.
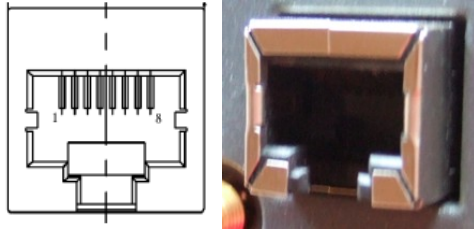
Figure 26. Face view of RJ45 smart card reader (radio part)

6.10.   Active GPS antenna connector

This connector provides the interface for the active GPS antenna with output supply 5V, 30mA through an SMA (female) connector.

Figure 27. Face view of SMA GPS antenna (radio part)

6.11.   TETRA antenna connector

This connector provides the interface for the TETRA RF antenna (50 ohm) through a TNC (female) connector.

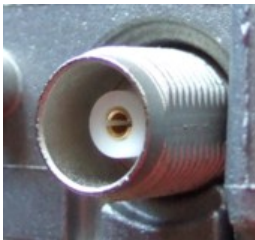**Figure 28.** Face view of TNC TETRA antenna (radio part)

6.12. Smart card connector

This connector provides the interface for a smart card or SIM card.

Figure 29. Face view of smart card connector (radio part)

7.Installing TMR880i

Note

Read these installation guidelines carefully through and follow them faithfully. Airbus DS SLC cannot guarantee the targeted functionality if the installation instructions are not properly followed.

7.1. Overview

The installation procedure consists of the following actions.

Steps:
1. Program the radio using the Taqto tool.
   Normally the programming is done in the service workshop before the items are taken to the use case environment. Consult the authorised person to program the radio in Taqto.

2. Install the antenna, preferably outside the office.

3. Install the control unit CUR-3 cablings.
   The speaker microphone cable and the system cable are installed to the radio at the back of CUR-3.

4. Assemble the desktop kit by first installing the radio unit, CUR-3 control unit and audio accessories to the DK kit's A-cover. Continue by installing the power supply unit ACR-7 inside the DK kit's B-cover. Make the necessary cable connections.

5. Check that all connections are safe and done correctly. Then assemble the A-and B-covers together. Connect the power to the mains.

6. Make a test call to verify that the installation is working correctly.

7. Instruct the users to operate and maintain the devices. Ensure that the user manual is available to the users.

7.2. Installing the antenna

7.2.1. Selecting the antenna site

Note

Select the antenna location so that it is safe for users, that is, the users can stay a minimum of 20 cm away. Install the antenna on the wall, roof or window outside of the building. Because the antenna's position can vary a lot, Airbus does not have any office antennas in our catalogue. We recommend to use good quality 3rd party antennas.

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Steps:
1. Install the office antenna outside of the office building, in accordance with:
   - The requirements of the antenna manufacturer / supplier
   - The requirements of the property owner and construction rules.

   The best mounting location for the antenna is nearby the radio, preferably at a distance of max 5m because the cable loss attenuation has an impact on the signal level. If the cable is too long, it may cause connectivity problems.

   Consult the network operator for the direction to the nearest base station. Install the antenna on that side of the building to get a better signal level.

   Follow the antenna manufacturer's instructions for the installation requirements.

2. Ensure that the antenna cable can be easily routed to the radio. Ensure that the antenna cable is routed separately and not in parallel with the mobile radio cable wiring or any other wiring.

3. Check the antenna location for any electrical interference.

4. Make sure that the mobile radio antenna is installed at least 30 cm away from any other antenna in the building.

   Note

   Any two metal pieces rubbing against each other (such as ladders or other metallic construction elements) in proximity to the antenna can cause severe receiver interference.

   ---

5. The TMR880i mobile radio has an integrated GPS board. If a GPS or combined TETRA/GPS antenna is used, make sure that the antenna has a clear view to the sky and that the antenna base which carries the GPS receiver is not covered with any metallic or radio frequency absorbing material.

7.2.2. Installing the antenna

Steps:
1. Mount the antenna according to the instructions provided with the antenna kit. Remember to check the grounding of the antenna's base. There are also office use antennas in the market which do not require separate grounding.

2. Run the coaxial cable to the radio mounting location. If necessary, cut off the excess cable and install a new TNC cable connector.

3. Connect the antenna cable connector to the radio antenna connector at the rear of the radio.

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4. In case of an installed GPS board, connect the GPS antenna to the GPS antenna connector at the front of the radio.

7.3. Assembling CUR-3

7.3.1. Assembling the installation cable

The installation cable CA-103 (or alternatively CA-108, CA-116) is assembled to the connectors at the left side of CUR-3 as can be seen in Figure 31.

Note

If you need to remove cables from CUR-3 during the cable installation, be careful that you connect the cables back to their original position.

The CA installation cable's CUR-3 end is divided into two board connectors. The connector with 1 cm longer wires belongs to the upper PWB connector and the shorter in the lower PWB connector. See Figure 30.
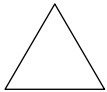
CAUTION

A wrong connection may harm the device, as a result of which it must be sent to the repair service.

The arrow in following figure illustrates the difference in length between the connectors in the CUR-3 installation cable.
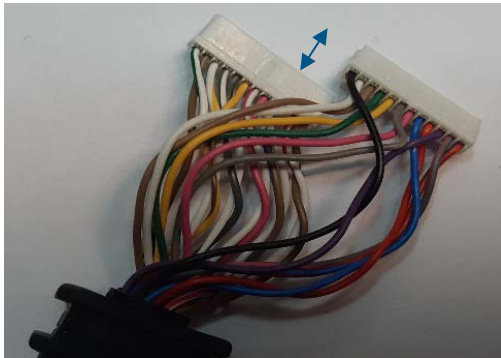

Figure 30. CUR-3installation cable

Figure 31. Connecting the CUR-3 installation cable

7.3.2. Connecting the speaker microphone cable (used with MPR-4)

MPR-4

A speaker microphone cable is used to provide the connection from the speaker microphone MPR-4 to the adapter cable CA-157.The adapter cable is an accessory which can be connected permanently to CUR-3's PWB connector via an opening (A) in the back cover. The opening is sealed and protected by a cable clamp (A). If the cable is not installed, the opening in CUR-3 must be protected by a gum plug (B). See Figure 31.

The speaker microphone cable's 10-pole connector provides a connection to the CUR-3 unit via a CA-157 adapter cable.

Figure 32. Fastened cable cover, with system cable and CA-157 speaker microphone cable

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Figure 33. CA-157 adapter cable with RJ-45 connector

7.3.3.   Tools needed for disassembling and assembling

- Screwdrivers (see the screw details in Table 1)

- Electrostatic discharge (ESD) gloves

- Crimp-on tool for flat cable connectors

- A drill 2.0…2.5mm

- Hot air blower (for heat shrink tubes)

- A multimeter (optional, for fault finding)

- Note on position 19: Only one item included. The model depends on the delivery time. MPR-4 has replaced MPR-1 in 2015.

- Note on position 12: The handset HSU-6 is an optional item, not included in the TMR880i or DK sales packages
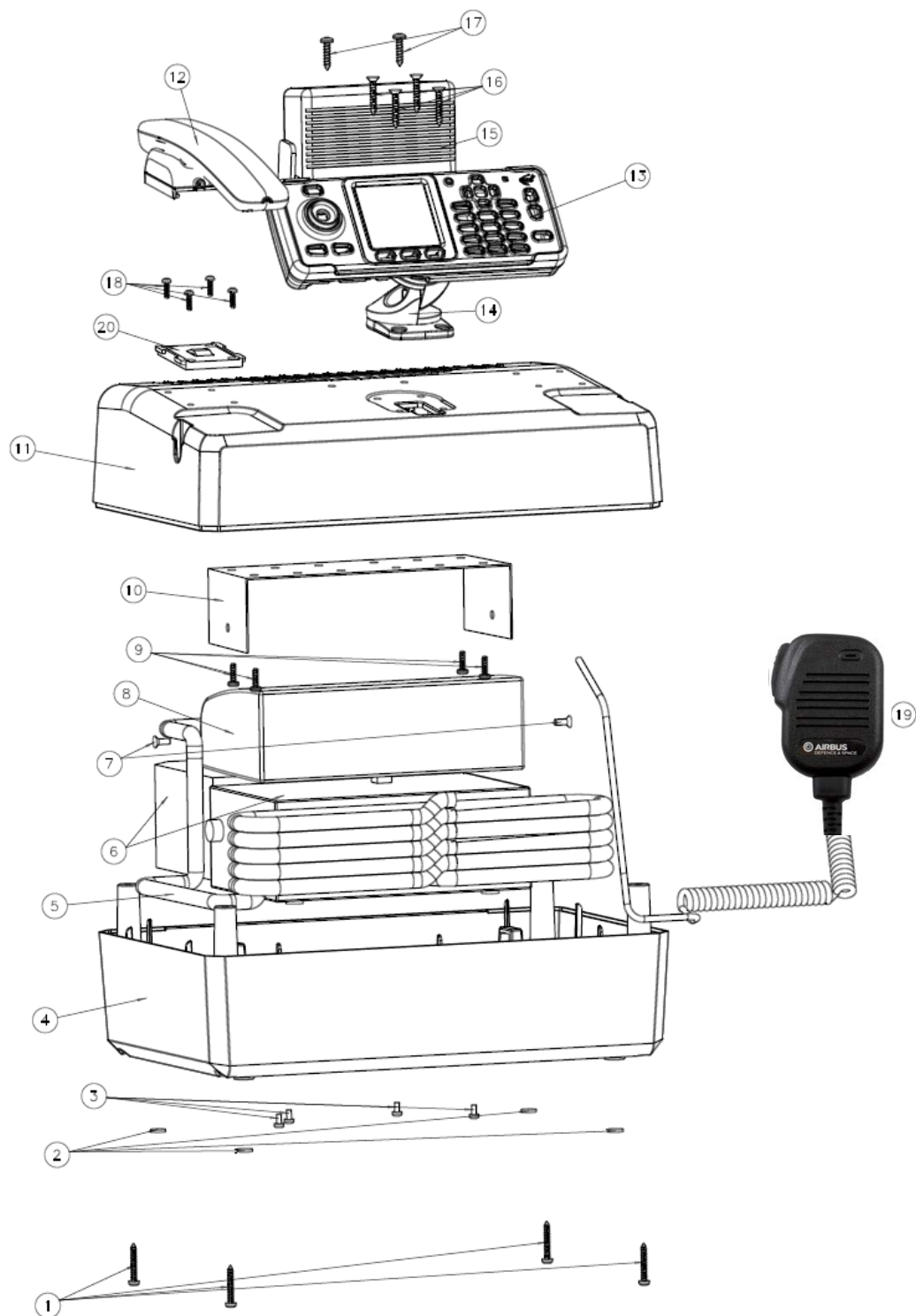
Figure 34. Main assembly of desktop

8. Assembling the DK kit

8.1. Assembling the A-cover

Steps:

1. Set the **A-cover item 11** on the table.

Figure 35. A-cover

2. Take the **Fixing plate item 10** and its screws.

Figure 36. Fixing plate

3. Screw the fixing plate to the A-cover. The A-cover is the top part.

Figure 37. Mounting the fixing plate

4. Take the radio part **RC-9/16**.

Note the different connectors :
1. Smart card connector

2. External smart card reader connector

3. GPS connector

Figure 38. Radio part
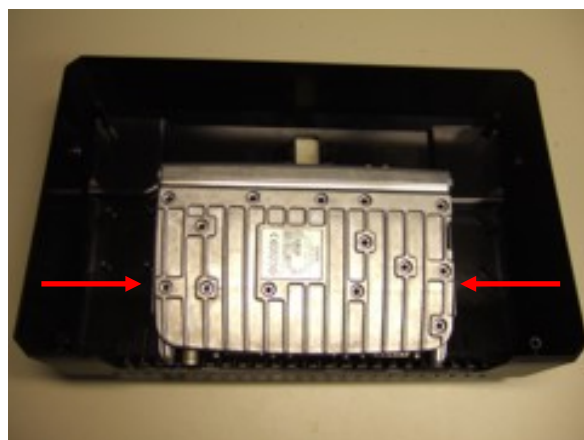
5. Mount and attach the radio into the fixing plate.

Figure 39. Mounting the radio

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6. Put **CUR-3** on the table. It is assembled with an installation cable and speaker microphone cable.

Figure 40. CUR-3 control unit

7. Take the **HHR-1** swivel mount. It includes:
   - MKE fixed mounting kit
   - Swivel body rear
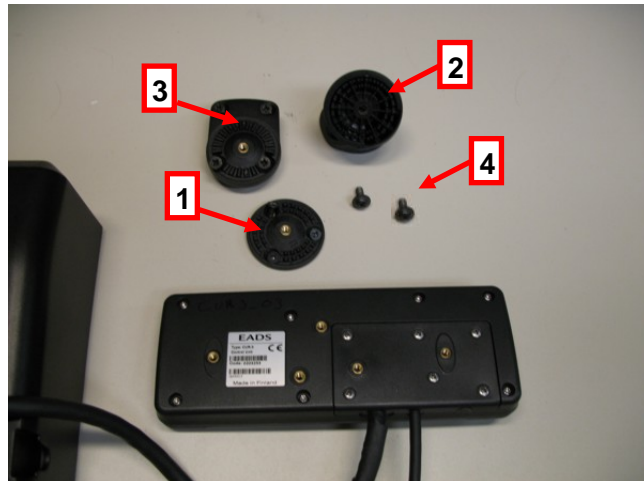   - Mounting plate
   - 2 screws

Figure 41. Swivel mount

8. Attach the MKE fixed mounting kit with the three screws (M4X8 DIN965 PZ Blk).

Figure 42. Attaching the swivel mount to CUR-3

9. Attach the **swivel body rear** using one screw (M5X12 BN4825 PZ Blk).

Figure 43. Attaching the swivel body

10. Pass the **CUR-3** cable through the hole in the A-cover (1). Leave the **CA-157** cable free.

11. Attach the **mounting plate** (2) with four screws (N08X1 Ins Csk Pozi/Dr Self)

Figure 44. Swivel mount and CUR-3 cable

12. Attach the assembled **CUR-3** and **swivel mount** on the B-cover (1) using one screw (M5X12 BN4825 PZ Blk).

13. Attach the **HFS-10 fixing plate** (2) with the two screws of installation kit (N08X1 Ins Csk Pozi/Dr Self).

Figure 45. CUR-3 and HFS-10 to A-cover

Alternatively, attach the **HFS-11** (OPTION) mounting flange.

Figure 46. HFS11 mount (OPTION) to A-cover

14. Mount the **HFS-10** speaker.

Figure 47. HFS-10 to A-cover

Alternatively, mount the **HFS-11** (OPTION) speaker.

Figure 48. HFS-11 (OPTION) to A-cover

15. Check the speaker microphone **MPR-4 kit**. Mount the MPR-4's accompanying metal holder flange to the right side of the A-cover. Use a 2.0…2.5mm drill to make the holes for the screws, using the holder flange to mark the spots for the holes. Be very careful of not damaging to the cables inside the A-cover while drilling or mounting the screws.

Figure 49. MPR-4 holder to A-cover

16. Note that the speaker microphone MPR-4's connector must be locked with a clamp (included in the MPR-4 delivery) or similar to protect the RJ-45 cable's connector when you need to operate the speaker microphone from a longer distance. The clamp can be fixed safely back of the D kit top cover (A) as seen in Figure 50.

Figure 50. MPR-4 cable clamp

8.2. Assembling the B-cover

8.2.1. Overview

Steps:
1. Set the **B-cover** on the table.

2. Install the power supply unit.

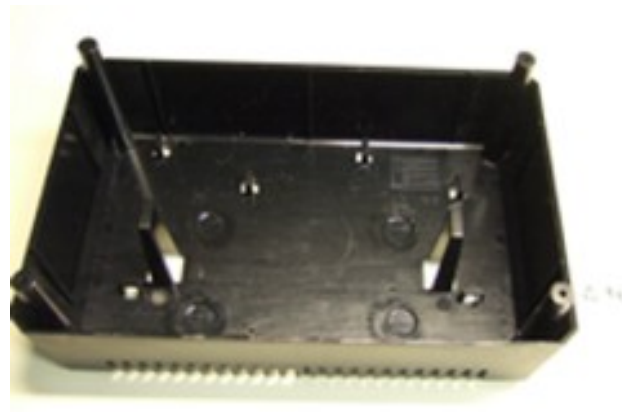3. Configure the IGN power on/off control settings.

Figure 51. B-cover

8.2.2. Installing the power supply unit

The office kit's main supply is obtained from the ACR-7 (ACR-1) power supply. Its power supply input voltage can vary between 100-240V AC. The output voltage is 12V DC and the maximum current is 10A. It is available in the EU, UK and US plug types. Refer to Table 2 for the sales code references.

Note

Use only Airbus's power supply to ensure safe and reliable use.

The mains socket outlet must be made easily accessible for the end user.

Prerequisites:
Before you install the power leads, make sure that all the relevant parts of your office configuration (power supply, antenna, accessories) are in proper condition.

Steps:
1. Fix the power supply unit to the B-cover's tall flanges with the cable ties, on the strain re-liefs.

2. Wrap the excess CUR-3 cable length next to the power sup-ply and fix it to the shallow B-cover flange using cable ties (for Ca-103/108 1.5/5.5m CUR-3 cables only. The short 0.7m CUR-3 cable CA-116 does not need to be tied).
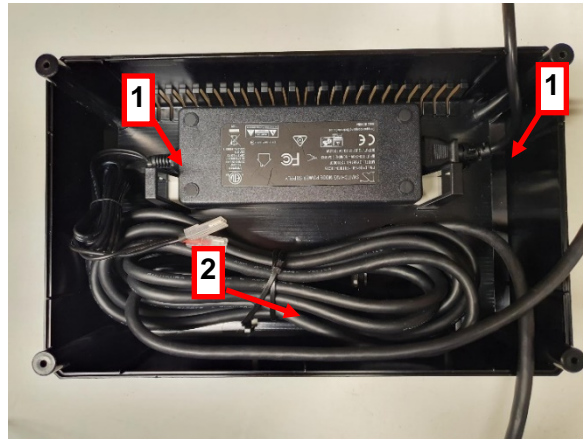
Figure 52. Fixing the power supply unit

3. Take the CA-105 system cable provided with the radio unit. It provides connectivity to the ac-cessories and power.

The parts shown in Figure 52 are:
1. Flashing, parametering con-nector
2. IGN and EXT
3. Power supply (GND and V+)
4. Data, handset, PTT button
5. Handsfree speaker
6. Not in use. Removed from the latest CA-105 cables.
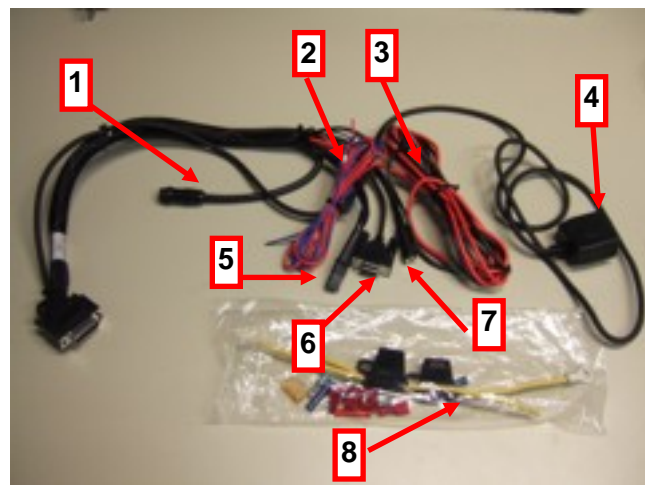7. Microphone
8. Fuses and fuses holders

Figure 53. System cable

Use the cable ties for the power and GND (3), IGN and EXT cables (2).

8.2.3. IGN power on/off control

The IGN control line can be used to switch on/off the supply voltage into the radio, from the 12V voltage supply. The IGN line must be connected to the corresponding power switch as instructed in this document. If the IGN line is connected to the supply line and the power supply is switched on, power on signaling is also supplied to the radio via the IGN line. Once the IGN line is switched off, there is a request to the user to confirm to continue the radio operation; otherwise the radio is also switched off when the IGN line gets down.

Simultaneous use of IGN and I/O interface lines
The IGS line detection does not work correctly if there is external voltage in other I/O pins during the radio's IGN start-up phase.

If your application requires to have I/O lines powered on while starting the radio, change a parameter (User interface settings / Power on parameters) to enable the radio start-up when power is connected, regardless of the IGS line state. With this setting, the IGS line is not used to start the radio.

Steps:
1. Connect fuse holders to Power (thick red) and IGS cables (thin red) by using the tubular crimp-on joints.
2. Use splitter to join the free ends of the fuse holders.
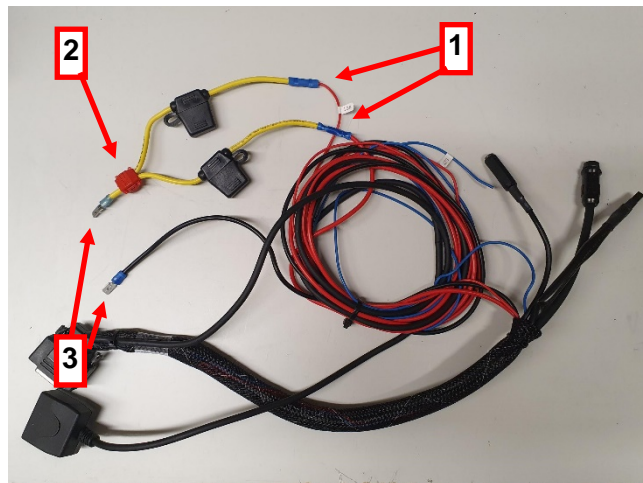3. Insert flat plug connectors to both Power (red) and Ground (black) cable ends.

Figure 54. Preparing the system cable

4. Insert the **1A fuse** to the IGS cable's fuse holder (1) (thin red).
5. Insert the **5A fuse** to the Power cable's fuse holder (2) (thick red).
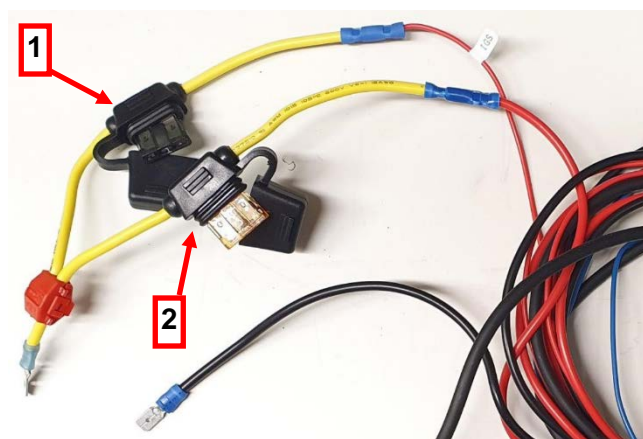

Figure 55. Fuses to the system cable

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8.3. Final assembly instructions

Steps:

Place the A- and B-cover close to each other and connect the power supply wires, minding their polarity.

1. Plug in the power supply +12V wire to the corresponding fuse holder wire of CA-105. Plug in the power supply GND connector to the CA-105 GND wire. Put a piece of heat shrink tube on the connectors to firmly sheath the joints.
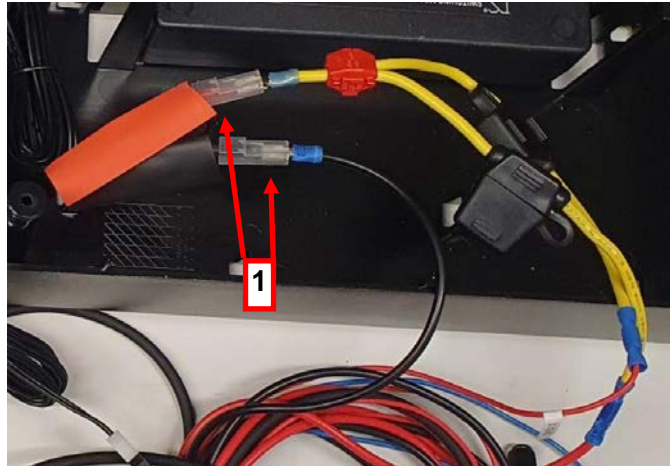

Figure 56. Connecting the supply wires

2. Heat the shrink tubes on the cable by using a hot air blower. Be careful to not heat any other parts.
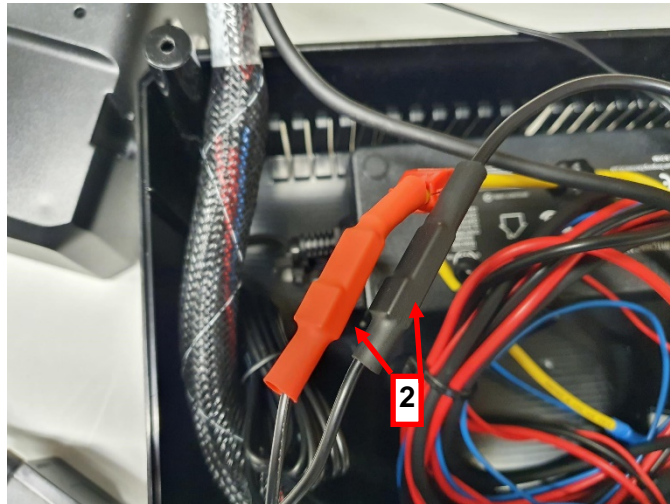

Figure 57. Protecting the supply wires

3. Connect the HFS-10/11 Loudspeaker's connector to the CA-105's corresponding connector.

4. Connect the handset RJ45's connector to the CA-105's corresponding connector (note the Handset" marking on the connector).
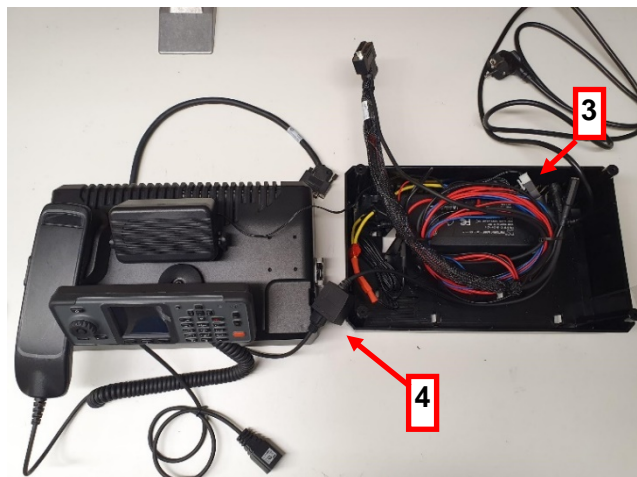

Figure 58. Connecting loudspeaker and handset

5. Move the cables in the B-cover.
   a. Attach the CA-105 cable (1) inside the B-cover using cable ties.
   b. Leave the flashing/parametrization connector (2) and HF microphone connector (2) accessible from the rear opening.
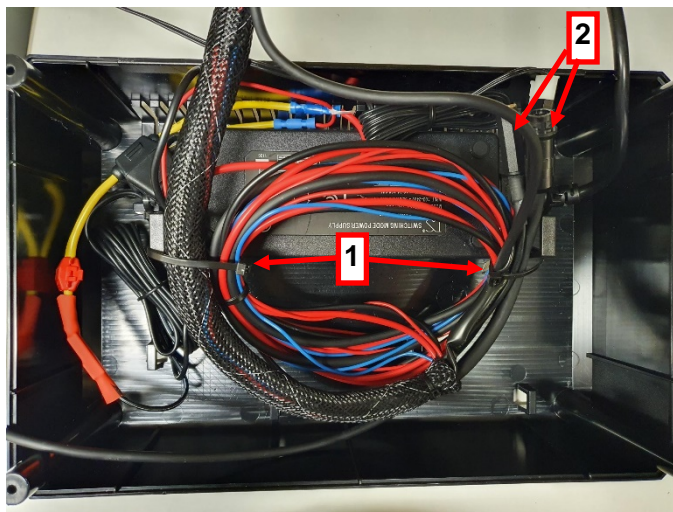

Figure 59. Cables to B-cover

6. Assemble the A- and B-cover. There are 4 cables that should be kept out of the desktop. Take care of them while closing the covers:
   1. Power supply unit power cable
   2. CA-108 installation cable
   3. CA-105 system cable
   4. HFS-10 Loudspeaker cable

NOTE: If you need other connections, such as flashing, parametrisation, data, GPS, smart card, handsfree microphone, or PTT button, read the instruction in chapter §Annex – optional connections before closing the desktop.
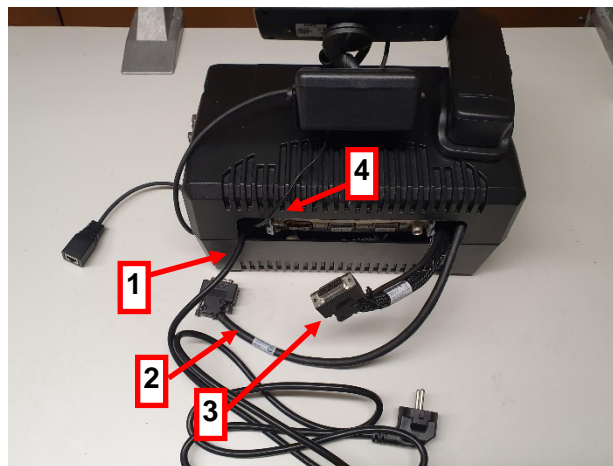

Figure 60. Assembling the A- and B-covers

7. Connect the CA-105 system cable (1).

8. Connect the CUR-3 installation cable.

   The auxiliary connector (3) is accessible for connexion if needed.

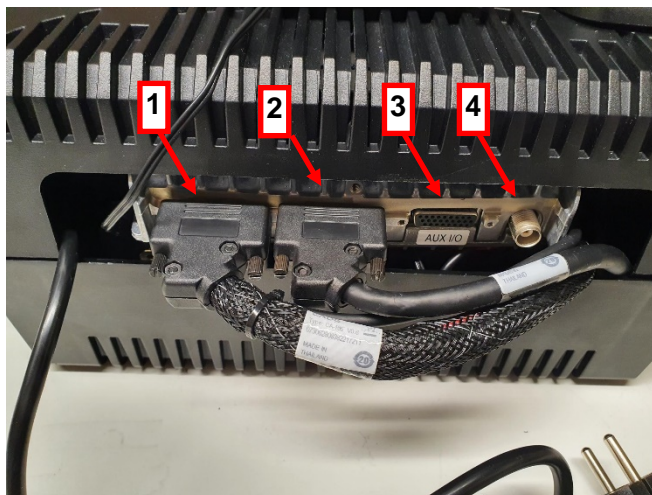   The TETRA antenna connector (4) is accessible for connexion on site.

Figure 61. Connecting TMR880i backplane connectors.

9. Move the covers carefully to get access to the B-cover's back. Put the 4 screws in their holes and screw them.
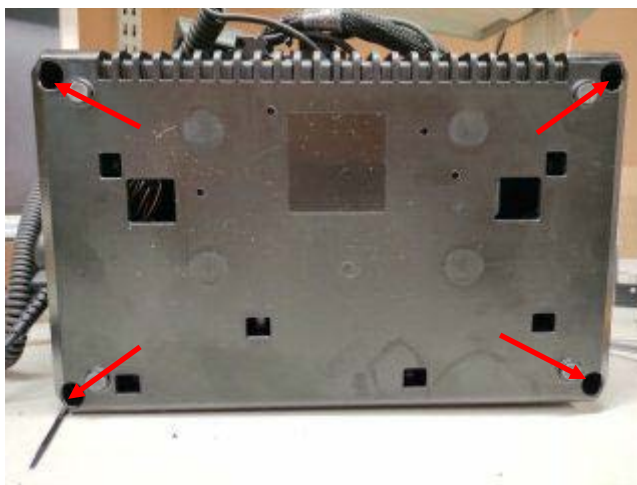

Figure 62. Mounting the A- and B-covers

10. Connect the **MPR-4** (1) to the CA-157 RJ-45 connector.

11. Put the MPR-4 to the holder flange (2) and test that it can be used conveniently.

The desktop assembly is now finished.

Figure 63. Connecting the speaker microphone

8.4. Installing HSU-6 (optional item)

The HSU-6 is an optional item.

Steps:
1. Set the **HSU-6 Handset** and its installation kit on the table.

Figure 64. Handset

2. Get the A-cover and screw the handset fixing plate into place

Figure 65. Handset fixing plate to A-cover

3. Fix the handset by sliding it in to the fixing plate (1).

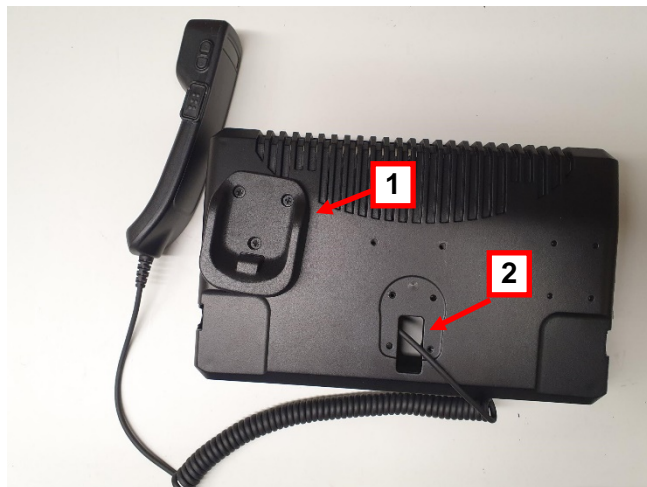   Pass the handset wire in A-cover's hole (2). Connect it to the CA-105 cable handset connector.

Figure 66. Handset to A-cover

9.Functional testing

This chapter instructs how to check the different functionalities of the desktop.

Checking the TMR880i and power supply

Power on TMR880i. If IGS is connected, the unit powers up right after connecting the mains supply. Otherwise use the power button.

Check that the starting menu is shown on the screen (PIN code request, phone code request or logo, depending on TMR880i configuration).

If it is not OK, check the following:

- Power supply unit connection to the mains supply
- Connection between the power supply unit and the radio RC-9/16
- Connection between the radio unit and the CUR-3
- Power supply connections and joints
- Fuses
- Power supply unit output voltage and output polarity by a multimeter.

Figure 67. Checking the power supply and supply connection

Checking the handset HSU-6 (OPTION) / HFS-10

Press the HSU-6T's PTT button.
- The HSU-6 check is OK if the CUR-3 LED becomes green.
- If not OK, check the HSU-6 connection to RC-9.

Release the HSU-6's PTT button.
- The HFS-10 check is OK if you can hear a short tone played when the PTT is pressed/released.
- If not OK, check the HFS-10 connection to RC-9.

Figure 68. Handset functionality check

Checking the speakermicrophone MPR-4 / HFS-10

Press the MPR-4's PTT button

- The check is OK if the CUR-3 LED becomes green.
- If not OK, check the 4 connection.

Release the MPR-4's PTT button.

- The HFS-10 check is OK if you can hear a short tone played when the PTT is pressed/released.
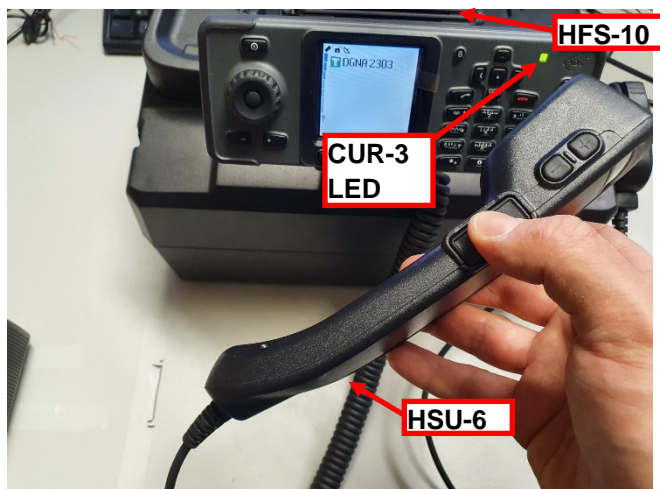- If not OK, check the HFS-10 connection to RC-9.

Figure 69. Speaker microphone functionality check

10. Configuring optional connections

This chapter gives an overview of how to configure optional connections.

Flashing connection

If you need flashing or parametrization functionality, bring the round hirose connector cable out of the box (see Figure 52 which identifies flashing and parametering connector).

Data connection

If you need data functionality, take the data connector out of the desktop (see Figure 52 which identifies the data connector and chapter 5.4 for the cable details). You can also connect the data cable before closing the covers.

GPS connection

If you need GPS functionality, connect your GPS cable on RC-9 (see Figure 38 which identifies the GPS connector and chapter 6.10 for details).

Smart card

If you need to use a smart card, connect your external smart card connector cable on RC-9 (see Figure 38 for the location and chapter 6.9 for details) or insert your smart card to the radio before closing the covers of the desktop kit (see Figure 38 for location and chapter 6.12 for details).

PTT button

If you need a PTT button, take the PTT button connector out of the desktop (see Figure 52 which identifies the PTT connector and chapter 5.3 for the cable details). You can also connect the cable before closing the covers of the desktop kit.

Handsfree microphone

If you need a handsfree microphone, take the handsfree microphone connector out of the desktop (see Figure 52 which identifies the handsfree microphone connector and chapter 5.2 for the HF microphone details). You can also connect the cable before closing the covers.

Auxiliary connector

If you need an auxiliary connector, it is accessible in the back panel of the desktop (see Figure 60 for the location and chapter 6.8 for details).

11. Programming in the Taqto tool

In Airbus TMR880i, the USB programming cable CA-122 must be inserted into the connector in the system cable as shown in the following figure.
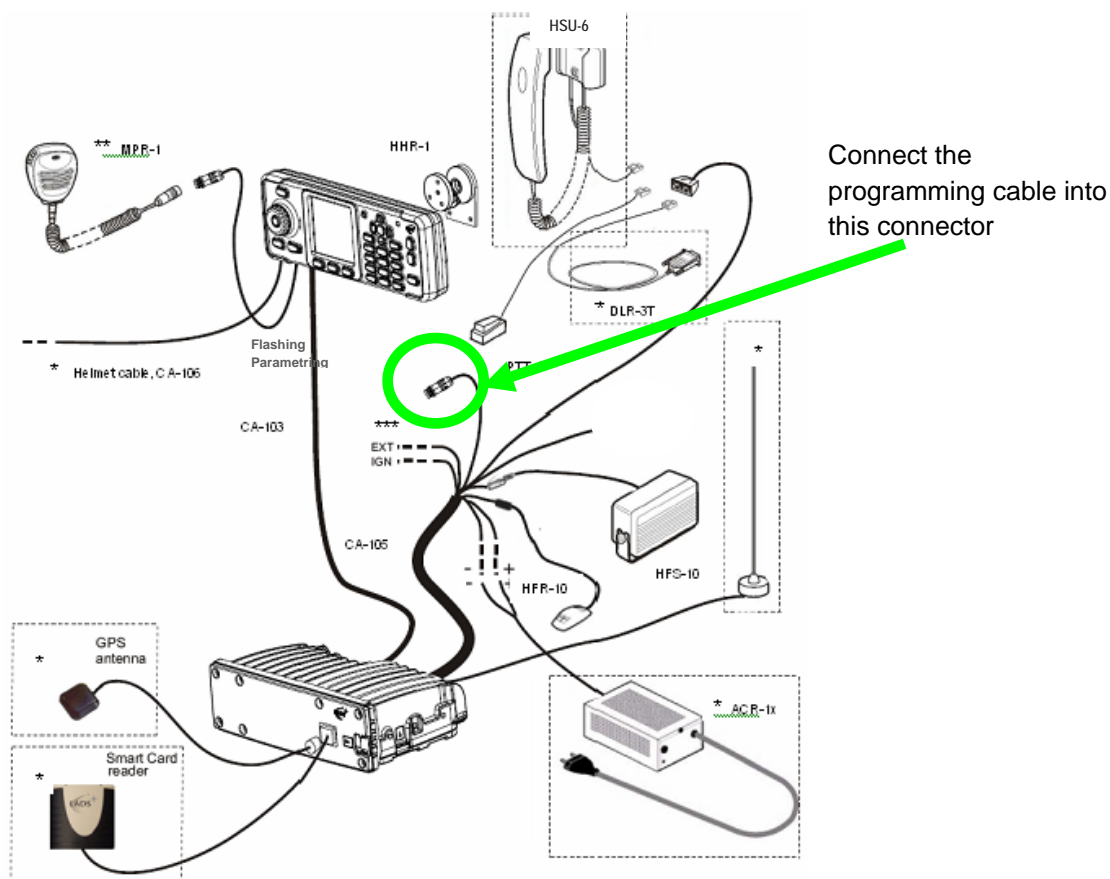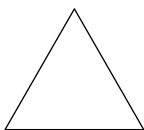

Connect the programming cable into this connector

Figure 70. Connecting the programming cable CA-122

Programming and flashing with USB cable CA-122 only works in radios with Release 8.11 or newer.

CAUTION

Make sure that you connect the cables correctly to the TMR880i radio. If you are flashing radios that have SW version that is older than Rel. 8.11, they require flashing devices FPS-XX. During connection/disconnection of FPS-xx programming device cables to CA-105, the +12V mains power supply must be powered off. Disconnect the ACR-7 power supply from mains to ensure this.

While the FPS-xx programming device is being attached to the system cable (CA-105), the +12 supply must be off during the connection/disconnection of CA-105 to the TMR880i radio. If the system cable is connected incorrectly with FPS-xx, it can cause a voltage peak which may cause some components of the TMR880i radio and/or FPS-xx programming device to break. As a result of these broken components, the E2EE

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smart card reader does not work properly in TMR880i or you may not be able to power on the radio. Also FPS-21 may not be able to identify or flash the radio.

Parametrization cable CA-122 can still be connected to the system cable CA-105 while the +12V supply is active.

The system cable must be connected to the TMR880i radio by complying with the following rules:

Option 1:
Mains power (DC 13.2 V/5A) must be switched off, if the flash cable is connected to the system cable when the system cable is connected or disconnected to/from the radio.

Option 2:
Mains power (DC 13.2 V/5A) may be switched on, if the flash cable is disconnected from the system cable when the system cable is connected or disconnected to/from the radio.