MTM5x00 Installation Manual

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European Union (EU) Waste of Electrical and Electronic Equipment (WEEE) directive

The European Union's WEEE directive requires that products sold into EU countries must have the crossed out trash bin label on the product (or the package in some cases).

As defined by the WEEE directive, this cross-out trash bin label means that customers and end-users in EU countries should not dispose of electronic and electrical equipment or accessories in household waste.

Customers or end-users in EU countries should contact their local equipment supplier representative or service centre for information about the waste collection system in their country.

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Icon Conventions

The documentation set is designed to give the reader more visual clues. The following graphic icons are used throughout the documentation set.

DANGER: The signal word DANGER with the associated safety icon implies information that, if disregarded, will result in death or serious injury.

WARNING: The signal word WARNING with the associated safety icon implies information that, if disregarded, could result in death or serious injury, or serious product damage.

CAUTION: The signal word CAUTION with the associated safety icon implies information that, if disregarded, may result in minor or moderate injury, or serious product damage.

CAUTION: The signal word CAUTION may be used without the safety icon to state potential damage or injury that is not related to the product.

IMPORTANT: IMPORTANT statements contain information that is crucial to the discussion at hand, but is not CAUTION or WARNING. There is no warning level associated with the IMPORTANT statement.

NOTICE: NOTICE contains information more important than the surrounding text, such as exceptions or preconditions. They also refer the reader elsewhere for additional information, remind the reader how to complete an action (when it is not part of the current procedure, for instance), or tell the reader where something is on the screen. There is no warning level associated with a notice.

Chapter 1

Scope of This Manual

This manual is intended for use by service technicians familiar with similar types of equipment. It contains information required for the installation of the equipment described and is current as of the printing date. Changes which occur after printing date are incorporated as a complete Manual revision or alternatively as additions. MTM5x00 platform is available in different software versions and various hardware configurations around the mobile radio. Different configurations are reflected in the product names MTM5200; MTM5400; MTM5500. This manual separates information between the different products when there is a difference.

> **NOTICE:** Only the trained personnel can install the mobile terminal. All installations should take place in accordance with the requirements of the vehicle and antenna manufacturer/supplier.

1.1
Safety Information

RF Energy Exposure and Product Safety Guide for Mobile Two-Way Radios

ATTENTION!

This radio is restricted to Occupational use only. Before using the radio, read the RF Energy Exposure and Product Safety Guide for Mobile Two-Way Radios which contains important operating instructions for safe usage and RF energy awareness and control for Compliance with applicable standards and Regulations.

For a list of Motorola Solutions-approved antennas and other accessories, visit the following website:

http://www.motorolasolutions.com

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter has been approved by Industry Canada to operate with Motorola Solutions-approved antenna with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Installation Requirements for Compliance with Radio Frequency (RF) Energy Exposure Safety Standards

> **CAUTION:**
> This radio is intended for use in occupational or controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC limits. This radio device is NOT authorized for general population, consumer, or any other use.

To ensure compliance to RF Energy Safety Standards:

- Install only Motorola Solutions approved antennas and accessories.

- Be sure that antenna installation is per Vehicle Antenna Installation on page 114.

- Be sure that Product Safety and RF Safety Booklet enclosed with this radio is available to the end user upon completion of the installation of this radio.

MTM5x00 Manuals and User Guides

Product Information Manual

• 68015000884 MTM5x00 Product Information Manual

Installation Instructions

• MTM5x00 Installation Manual (English)

• MTM5x00 Installation Manual (English/German)

Service Manual

• 68015000183 MTM5200/MTM5400/MTM800 FuG Basic Service Manual EMEA (English)

• 68015000587 MTM5200/MTM5400 Basic Service Manual APAC (English)

Quick Start Guides

• 68015000289 MTM5x00 Quick Start Guide (English)

• 68015000290 MTM5x00 Quick Start Guide (Spanish)

• 68015000291 MTM5x00 Quick Start Guide (Norwegian)

• 68015000292 MTM5x00 Quick Start Guide (Dutch)

• 68015000293 MTM5x00 Quick Start Guide (German)

• 68015000294 MTM5x00 Quick Start Guide (Polish)

• 68015000295 MTM5x00 Quick Start Guide (Italian)

• 68015000296 MTM5x00 Quick Start Guide (French)

• 68015000297 MTM5x00 Quick Start Guide (Danish)

• 68015000298 MTM5x00 Quick Start Guide (Swedish)

• 68015000288 MTM5x00 Quick Start Guide (Traditional Chinese)

• 68015000287 MTM5x00 Quick Start Guide (Simplified Chinese)

• 68015000286 MTM5x00 Quick Start Guide (Korean)

• 68015000285 MTM5x00 Quick Start Guide (Arabic)

• 68015000284 MTM5x00 Quick Start Guide (Lithuanian)

• 68015000549 MTM5x00 Quick Start Guide (Russian)

• 68015000550 MTM5x00 Quick Start Guide (Portuguese)

• 68015000551 MTM5x00 Quick Start Guide (Hebrew)

• 68015000569 MTM5x00 Quick Start Guide (Romanian)

• 68015000865 MTM5x00 Quick Start Guide (Catalonian)

• 68015000613 TSCH Quick Start Guide (English)

• 68015000614 TSCH Quick Start Guide (German)

• 68015000675 TSCH Quick Start Guide (Lithuanian)

• 68015000676 TSCH Quick Start Guide (Norwegian)

• 68015000677 TSCH Quick Start Guide (Arabic)

• 68015000681 TSCH Quick Start Guide (Spanish)

- 68015000682 TSCH Quick Start Guide (Dutch)
- 68015000683 TSCH Quick Start Guide (Polish)
- 68015000684 TSCH Quick Start Guide (Italian)
- 68015000685 TSCH Quick Start Guide (French)
- 68015000686 TSCH Quick Start Guide (Danish)
- 68015000687 TSCH Quick Start Guide (Swedish)
- 68015000688 TSCH Quick Start Guide (Russian)
- 68015000689 TSCH Quick Start Guide (Portuguese)
- 68015000690 TSCH Quick Start Guide (Hebrew)
- 68015000691 TSCH Quick Start Guide (Romanian)
- 68015000692 TSCH Quick Start Guide (Catalonian)

> **NOTICE:** TSCH stands for Telephone Style Control Head.

User Guides

- 68015000180 MTM5x00 Feature User Guide (English)
- 68015000186 MTM5x00 Feature User Guide (English/German)
- MN002108A01 MTM5x00 Feature User Guide (English/Spanish)
- MN002109A01 MTM5x00 Feature User Guide (English/Portuguese)
- MN005444A01 MTM5x00 Feature User Guide (English/Polish)
- MN005513A01 MTM5x00 Feature User Guide (English/French)

Safety Leaflet

- North America TETRA RF Safety Booklet

Model Information and Accessories

2.1
Model Descriptions

Table 1: Radio Model Descriptions

Model	Description
M1	Dash Mount with Mobile Terminal with Direct Mount Enhanced Control Head, Speaker, Microphone or Handset, Standard User Guide, and Installation Accessories.
M2	Desk Mount with Mobile Terminal with Direct Mount Enhanced Control Head, Speaker, Microphone or Handset, Standard User Guide, Installation Accessories, and Tray with a Power Supply.
M3	Remote Mount with Mobile Terminal with Remote Mount Enhanced Control Head, optional either with Remote Head Enhanced or Data Expansion Head Enhanced, Speaker, Microphone or Handset, Remote Mount cables, Standard User Guide, and Installation Accessories. For MTM5500/ – Remote Mount with Mobile Terminal with Remote Mount Ethernet Enhanced Control Head with Ethernet Data Expansion Head, Speaker, Microphone or Handset, Remote Mount cables, Standard User Guide, and Installation Accessories. The remote mount control heads can be: • Telephone Style Control Head • Ethernet Remote Control Head • A combination of both Control Heads or two of each Control Head
M4	Motorcycle Mount with Mobile Terminal with Motorcycle Mount Enhanced Control Head, optional either with Remote Head Enhanced or Data Expansion Head Enhanced, Speaker, Microphone or Handset, Motorcycle cables, Standard User Guide, and Installation Accessories; Dual Control Mount with two Enhanced Control Heads (master and slave) and a Junction Box, Audio Accessories, Standard User Guide, and Installation Accessories.
M5	Data Box – Remote Mount Configuration with Expansion Head Enhanced, without Enhanced Control Head, Remote Mount cables, Standard User Guide, Installation Accessories, and a Power Supply.

NOTICE: No other combinations are permitted.

2.2
Sales Model Nomenclature

Table 2: Sales Model Nomenclature

Position	0	1	2	3	4	5	6	7	8	9	10	11	12
Typical Model Number	MD	M	8	3	P	F	S	6	T	Z	5	A	N

Table 3: Sales Models – Description of Position

Position	Description	Value
0	Region	AZ = Asia
		MD = Europe
1	Type of Unit	M = Mobile Product
2	Model Series	83 = MTM5200/MTM5400/MTM5500/
3		
4	Frequency Band	M = 260–275 MHz
		N = 350–390 MHz
		P = 380–430 MHz
		R = 410–470 MHz
		U = 806–870 MHz (for DMO; 851–870 MHz)
5	Power Level	C = 3.0 Watts (MTM5200)
		F = 10.0 Watts (MTM5400/MTM5500)
6	Physical Packages	A = Data Box (No Control Head)
		S = Enhanced Control Head
		T = Ethernet
7	Channel Spacing	6 = 20/25 kHz
8	Primary Operation	T = TDMA Digital Dual Mode
9	Primary System Type	Z = TETRA
10	Feature Level	5 = Dash/Data Mount
		4 = Desk Mount
		2 = Motorcycle Mount
		6 = Remote Mount
11	Version	Model Version – for example A, B, C
12	Unique Variation	N = Standard Package
		G = FuG Models

2.3

Mobile Terminal Model Information

Motorola Solutions uses sales model prefixes to denote regional kit differences. AZ or MD may be found in use.

Table 4: Type and Model Numbers

This manual applies to the following MTM5000 Series Mobile Terminal Models:

Type No.	Series	Sales Model No.	Short Description	Model
MT853C	5200	M83NCS6TZ5AN	MTM5200 350–390 MHz, DASH	M1
		M83NCS6TZ4AN	MTM5200 350–390 MHz, DESK	M2

Type No.	Series	Sales Model No.	Short Description	Model
		M83NCS6TZ6AN	MTM5200 350–390 MHz, REMOTE	M3
		M83NCS6TZ2AN	MTM5200 350–390 MHz, M`CYCLE	M4
		M83NCA6TZ5AN	MTM5200 350–390 MHz, DATA	M5
		M83PCS6TZ5AN	MTM5200 380–430 MHz, DASH	M1
		M83PCS6TZ4AN	MTM5200 380–430 MHz, DESK	M2
MT953C	5200	M83PCS6TZ6AN	MTM5200 380–430 MHz, REMOTE	M3
		M83PCS6TZ2AN	MTM5200 380–430 MHz, M'CYCLE	M4
		M83PCA6TZ5AN	MTM5200 380–430 MHz, DATA	M5
		M83RCS6TZ5AN	MTM5200 410–470 MHz, DASH	M1
		M83RCS6TZ4AN	MTM5200 410–470 MHz, DESK	M2
MT553C	5200	M83RCS6TZ6AN	MTM5200 410–470 MHz, REMOTE	M3
		M83RCS6TZ2AN	MTM5200 410–470 MHz, M'CYCLE	M4
		M83RCA6TZ5AN	MTM5200 410–470 MHz, DATA	M5
		M83UCS6TZ5AN	MTM5200 806–870 MHz, DASH	M1
		M83UCS6TZ4AN	MTM5200 806–870 MHz, DESK	M2
MT753C	5200	M83UCS6TZ6AN	MTM5200 806–870 MHz, REMOTE	M3
		M83UCS6TZ2AN	MTM5200 806–870 MHz, M'CYCLE	M4
		M83UCA6TZ5AN	MTM5200 806–870 MHz, DATA	M5
		M83NFS6TZ5AN	MTM5400 350–390 MHz, DASH	M1
		M83NFS6TZ4AN	MTM5400 350–390 MHz, DESK	M2
MT853C	5400	M83NFS6TZ6AN	MTM5400 350–390 MHz, REMOTE	M3
		M83NFS6TZ2AN	MTM5400 350–390 MHz, M`CYCLE	M4
		M83NFA6TZ5AN	MTM5400 350–390 MHz, DATA	M5
		M83PFS6TZ5AN	MTM5400 380–430MHz, DASH	M1
		M83PFS6TZ4AN	MTM5400 380–430MHz, DESK	M2
MT953C	5400	M83PFS6TZ6AN	MTM5400 380–430 MHz, REMOTE	M3
		M83PFS6TZ2AN	MTM5400 380–430 MHz, M'CYCLE	M4
		M83PFA6TZ5AN	MTM5400 380–430 MHz, DATA	M5
		M83RFS6TZ5AN	MTM5400 410–470 MHz, DASH	M1
		M83RFS6TZ4AN	MTM5400 410–470 MHz, DESK	M2
MT553C	5400	M83RFS6TZ6AN	MTM5400 410–470 MHz, REMOTE	M3
		M83RFS6TZ2AN	MTM5400 410–470 MHz, M'CYCLE	M4
		M83RFA6TZ5AN	MTM5400 410–470 MHz, DATA	M5
		M83UFS6TZ5AN	MTM5400 806–870 MHz, DASH	M1
		M83UFS6TZ4AN	MTM5400 806–870 MHz, DESK	M2
MT753C	5400	M83UFS6TZ6AN	MTM5400 806–870 MHz, REMOTE	M3
		M83UFS6TZ2AN	MTM5400 806–870 MHz, M'CYCLE	M4

Type No.	Series	Sales Model No.	Short Description	Model
		M83UFA6TZ5AN	MTM5400 806–870 MHz, DATA	M5
MT853C	5500	M83NFA6TZ6AN	MTM5500 350–390 MHz, DATA	M3
		M83NFT6TZ6AN	MTM5500 350–390 MHz, REMOTE	M3
MT953C	5500	M83PFA6TZ6AN	MTM5500 380–430 MHz, DATA	M3
		M83PFT6TZ6AN	MTM5500 380–430 MHz, REMOTE	M3
MT533C	5500	M83RFA6TZ6AN	MTM5500 410–470 MHz, DATA	M3
		M83RFT6TZ6AN	MTM5500 410–470 MHz, REMOTE	M3
MT753C	5500	M83UFT6TZ6AN	MTM5500 806–870 MHz, REMOTE	M3

NOTICE: MTM5500 M3 models must select Telephone Style Control Head – TSCH and/or Ethernet Control Head – eCH

WARNING: Ethernet Expansion Heads are only compatible with Ethernet Remote Heads. Do not mix the Ethernet control head with non-Ethernet control heads. Also ensure use of the proper Ethernet cables to connect Ethernet Expansion Head with TSCH, eCH, or another Ethernet Expansion Head. If not connected properly, transceiver can be broken.

2.4
Model Specifications

Technical information may be subject to change without further notice.

Table 5: General Specifications

Parameter	Value	
ETSI	ETS 300 394-1	
	ETS 300 489-1	
Type Number	MTM5200, MTM5400 350–390 MHz	MT853C
	MTM5x00 380–430 MHz	MT953C
	MTM5x00 410–470 MHz	MT553C
	MTM5x00 806–870 MHz	MT753C
Temperature Range for Transceiver	Operating	-30 °C to +60 °C
	Storage	-40 °C to +85 °C
Power Supply	Minimum	10.8 VDC
	Nominal	13.2 VDC
	Maximum	15.6 VDC
	Maximum Current	Approx. 4.5 A
Dimensions (HxWxD) in mm	Transceiver with Enhanced Control Head, Dash Mount	60 x 188 x 198
	Transceiver with Ethernet Expansion Head	45 x 170 x 190
	Ethernet Control Head (eCH)	60 x 190 x 40
	Telephone Style Control Head (TSCH)	220 x 65 x 75

Parameter	Value	
Weight in grams	Transceiver with Enhanced Control Head, Dash Mount	1500
	Transceiver with Ethernet Expansion Head	1330
	Ethernet Control Head (eCH)	310
	Telephone Style Control Head (TSCH) (excluding cable)	450
GNSS Performance	Autonomous Acquisition Sensitivity	-146 dBm / -176 dBW
	Tracking Sensitivity	-160 dBm / -190 dBW

Table 6: Receiver Specifications

Parameter	Value	
Receiver Type	Direct Conversion	
Frequency Range	MT853C	350–390 MHz
	MT953C	380–430 MHz
	MT553C	410–470 MHz
	MT753C	806–870 MHz (DMO = 851–870 MHz)
Channel Spacing	25 kHz	
Sensitivity (3.5%) BER	-114 dBm (Static), -105 dBM (Dynamic)	
Intermodulation	-47 dBm	
Blocking (50–100 kHz)	-40 dBm	
Spurious Rejection	-45 dBm	
Adjacent Channel Interference Ratio	-45 dBm	
Frequency Stability	Locked to Base	+/- 100 Hz
	Unlocked to Base	+/- 1 kHz
Audio Rated (@4 Ω)	For External Speaker:	10 W
	Distortion at Rated Audio:	5% Maximum

Table 7: Transmitter Specifications

Parameter	Value
Modulation Type	µ/4DQPSK
	4-QAM
	16-QAM
	64-QAM
RF Power	Adjustable to Class 2 (10 W), Class 2L (5.6 W), Class 3 (3 W). Power in MSPD mode limited to Class 2L. Power in TEDS mode limited to Class 3. For MTM5200 Class 3 (3 W) only.

Parameter	Value	
Frequency Range	MT853C	350–390 MHz
	MT953C	380–430 MHz
	MT553C	410–470 MHz
	MT753C	806–870 MHz (DMO = 851–870 MHz)
Frequency Stability	Locked to Base	+/- 100 Hz
	Not Locked to Base	+/- 1 kHz
Spurious Emissions (Conducted/Radiated)	- 36 dBm <=1 GHz	
	- 30 dBm > 1 GHz	
Adjacent Channel Power Ratio (@ ± 25 kHz)	-60 dBc	

2.5
MTM5200/MTM5400/ Accessories-to-Model Chart

Table 8: Antennas

Accessory	Part Number	M1	M2	M3	M4	M5
Antenna Glass Mount 350–390 MHz	GMAD4494_	x	x	x	x	x
Antenna Panel Mount 350–390 MHz	GMAD4495_	x	x	x	x	x
Antenna Magnetic Mount 350–390 MHz	GMAD4496_	x	x	x	x	x
Antenna Covert 350–390 MHz	GMAD4497_	x	x	x	x	x
Antenna Wall Mount 350–390 MHz	GMAD4498_	x	x	x	x	x
Antenna Motorcycle 350–390 MHz	GMAD4499_				x	
Antenna Whip Flexible Hinged 350–390 MHz	GMAD4501_	x	x	x	x	x
Antenna Low Profile 350–390 MHz	GMAD4503_	x	x	x	x	x
Antenna Whip Hinged 350–390 MHz	GMAG4502_	x	x	x	x	x
Antenna TETRA Magnetic Mount	GMAE4256	x	x	x	x	x
Antenna Tetra Covert Strip Glass 380–400 MHz	GMAE4258_	x	x	x	x	x
Antenna Tetra Low Profile 380–400 MHz	GMAE4260_	x	x	x	x	x
Antenna Tetra Wall Mount 380–400 MHz	GMAE4262_	x	x	x	x	x
Antenna Tetra Motorcycle 380–400 MHz	GMAE4266_	x	x	x	x	x
Antenna Whip Tetra Flexible Hinged 380–400 MHz	GMAE4279_	x	x	x	x	x
Antenna Whip Tetra Hinged 380–400 MHz	GMAE4282_	x	x	x	x	x
Antenna Whip Tetra Hinged 380–430 MHz	GMAE4253_	x	x	x	x	x
Antenna Tetra Panel/Roof Mount 380–430 MHz	GMAE4255_	x	x	x	x	x
Antenna Whip Tetra Flexible Hinged 380–430 MHz	GMAE4281_	x	x	x	x	x
Antenna Whip Tetra Hinged 380–430 MHz	GMAE4284_	x	x	x	x	x

Accessory	Part Number	M1	M2	M3	M4	M5
Antenna Tetra Glass Mount 410–430 MHz	GMAE4254_	x	x	x	x	x
Antenna Tetra Magnetic Mount 410–430 MHz	GMAE4257_	x	x	x	x	x
Antenna Tetra Covert Strip Glass 410–430 MHz	GMAE4259_	x	x	x	x	x
Antenna Tetra Low Profile 410–430 MHz	GMAE4261_	x	x	x	x	x
Antenna Tetra Wall Mount 410–430 MHz	GMAE4263_	x	x	x	x	x
Antenna Tetra Motorcycle 410–430 MHz	GMAE4267_	x	x	x	x	x
Antenna Whip Tetra Flexible Hinged 410–430 MHz	GMAE4280_	x	x	x	x	x
Antenna Whip Tetra Hinged 410–430 MHz	GMAE4283_	x	x	x	x	x
Antenna Motorcycle UHF 430–470 MHz	GMAE4268_				x	
Antenna Panel / Roof Mount 430–470 MHz	GMAE4271_	x	x	x	x	x
Antenna Magnetic Mount 430–470 MHz	GMAE4272_	x	x	x	x	x
Antenna Covert Glass Strip 430–470 MHz	GMAE4273_	x	x	x	x	x
Antenna Low Profile 430–470 MHz	GMAE4274_	x	x	x	x	x
Antenna Wall Mount 430–470 MHz	GMAE4275_	x	x	x	x	x
Antenna Glass Mount 450–470 MHz	GMAE4270_	x	x	x	x	x
Antenna Whip Tetra Flexible Hinged 450 MHz	GMAE4285_	x	x	x	x	x
Antenna Whip Flex Tetra 450 MHz	GMAE4286_	x	x	x	x	x
Antenna Glass Mount 3 dB 800 MHz	GMAF4409_	x	x	x	x	x
Antenna TETRA Glass Mount 0 dB 800 MHz	GMAF4410_	x	x	x	x	x
Antenna Panel Mount 800 MHz	GMAF4411_	x	x	x	x	x
Antenna Magnetic Mount 800 MHz	GMAF4412_	x	x	x	x	x
Antenna Magnetic Mount 3 dB 800 MHz	GMAF4413_	x	x	x	x	x
Antenna TETRA Covert 800 MHz	GMAF4414_	x	x	x	x	x
Antenna Low Profile 800 MHz	GMAF4415_	x	x	x	x	x
Antenna Wall Mount 800 MHz	GMAF4416_	x	x	x	x	x
Antenna TETRA Motorcycle 800 MHz	GMAF4417_				x	
Antenna Mount Panel/Roof thickness up to 4 mm	GMLN4276_	x	x	x	x	x
Antenna Mount Panel/Roof thickness up to 6 mm	GMLN4277_	x	x	x	x	x
Antenna Mount Magnetic	GMLN4278_	x	x	x	x	x

Table 9: Cables

Accessory	Part Number	M1	M2	M3	M4	M5
Remote Mount Cable (Terminal to Control Head), 10 m	PMKN4020_			x		
Ignition Switch Cable	HKN9327_	x		x	x	
Remote Mount Cable (Terminal to Control Head), 3 m	RKN4077_			x		
Remote Mount Cable (Terminal to Control Head), 5 m	RKN4078_			x		
Remote Mount Cable (Terminal to Control Head), 7 m	RKN4079_			x		

Accessory	Part Number	M1	M2	M3	M4	M5
Accessories Expansion Cable, 2.3 m	PMKN4029_			x	x	
Accessories Expansion Cable, 4 m	PMKN4056_			x	x	
Motorcycle Mount TELCO Cable, 2.3 m	PMKN4030_				x	
Rear Adaptor Cable	PMKN4118_		x			

Table 10: Control Heads

Accessory	Part Number	M1	M2	M3	M4	M5
IP67 Motorcycle Control Head, Roman Keypad	PMWN4002_				x	
IP67 Motorcycle Control Head, Chinese Keypad	PMWN4003_				x	
IP67 Motorcycle Control Head, Korean Keypad	PMWN4004_				x	
IP67 Motorcycle Control Head, Arabic Keypad	PMWN4005_				x	
IP67 Motorcycle Control Head, Taiwanese Keypad	PMWN4006_				x	
IP67 Motorcycle Control Head, Cyrillic Keypad	PMWN4007_				x	
IP67 Motorcycle Control Head - Japanese	PMWN4044_				x	
Control Head, Roman Keypad	PMWN4009_	x	x			
Control Head, Chinese Keypad	PMWN4010_	x	x			
Control Head, Korean Keypad	PMWN4011_	x	x			
Control Head, Arabic Keypad	PMWN4012_	x	x			
Control Head, Taiwanese Keypad	PMWN4013_	x	x			
Control Head, Cyrillic Keypad	PMWN4014_	x	x			
Control Head, Hebrew Keypad	PMWN4016_	x	x			
Control Head - Japanese	PMWN4042_	x	x			
Remote Mount Control Head, Roman Keypad	PMWN4017_			x		
Remote Mount Control Head, Chinese Keypad	PMWN4018_			x		
Remote Mount Control Head, Korean Keypad	PMWN4019_			x		
Remote Mount Control Head, Arabic Keypad	PMWN4020_			x		
Remote Mount Control Head, Taiwanese Keypad	PMWN4021_			x		
Remote Mount Control Head, Cyrillic Keypad	PMWN4022_			x		
Remote Mount control Head, Japanese Keypad	PMWN4043_			x		

Table 11: Desktop and Data Box Mount

Accessory	Part Number	M1	M2	M3	M4	M5
Desktop Tray without Loudspeaker	GLN7318_		x			
Desktop Tray with Loudspeaker	RSN4005_		x			

Table 12: Expansion and Remote Head Kits

Accessory	Part Number	M1	M2	M3	M4	M5
Remote Head	PMLN4904_			x	x	
Data Expansion Head	PMLN4908_			x	x	x

Table 13: GPS

Accessory	Part Number	M1	M2	M3	M4	M5
Antenna Combined Tetra and GPS 350 MHz	PMAE4493_	x	x	x	x	x
Antenna Combined Tetra and GPS 380–430 MHz SMA	GMAE4507_	x	x	x	x	x
Antenna Combined GPS 430–470 MHz	GMAE4269	x	x	x	x	x
Antenna Combined Tetra and GPS 430–470 MHz SMA	PMAE4269_	x	x	x	x	x
Antenna Combined Tetra and GPS 800 MHz	GMAF4408_	x	x	x	x	x
Antenna Combined Tetra and GPS 806–870 MHz SMA	PMAF4408_	x	x	x	x	x
Antenna GPS Panel/Roof Mount SMA	GMAG4253_	x	x	x	x	x
Antenna GPS Only Magnetic Mount SMA	GMAG4254_	x	x	x	x	x

Table 14: Handsets

Accessory	Part Number	M1	M2	M3	M4	M5
Telephone-Style Handset	GMUN1006_	x	x	x	x	
IMPRES Telephone Style Handset Kit	MDHLN7016_			x		
Kit, Telephone Handset Hardware	NNTN7214_	x	x	x	x	x
Kit, Telephone Handset Bracket	NNTN7232_	x	x	x	x	x

Table 15: Installation

Accessory	Part Number	M1	M2	M3	M4	M5
External Alarm Relay	GKN6272_	x	x	x	x	
Buzzer Kit	GLN7282_	x	x	x	x	
Accessory Connector Kit – radio rear (use with a Junction Box)	HLN9457_	x	x	x	x	

Table 16: Junction Box

Accessory	Part Number	M1	M2	M3	M4	M5
Data Junction Box with Accessory Connector	GMLN5089_	x	x	x	x	
Cable 6 m Transceiver to Junction Box[1]	PMKN4101_	x	x	x	x	
Cable 4 m Transceiver to Junction Box[1]	PMKN4102_	x	x	x	x	
Cable 2 m Transceiver to Junction Box[1]	PMKN4103_	x	x	x	x	

Table 17: Microphones

Accessory	Part Number	M1	M2	M3	M4	M5
Fist Microphone with a clip[1]	GMMN4063_	x	x	x		x
Visor Mounted Microphone Headset	GMMN4065_	x	x	x	x	x
BMI Hearer Speaker Microphone[2]	PMMN4070_	x[3]	x	x[3]	x	x
Hearer Speaker Microphone with Earphone Jack and Emergency Button	PMMN4086_	x	x	x	x	x
Visor Microphone	PMMN4087_	x	x	x	x	x
Smart Visor Microphone	RMN5054_	x	x	x	x	x
Desktop Microphone, Mobile Microphone Port	RMN5106_	x	x	x		
Compact Fist Microphone with a clip	RMN5107_	x	x	x	x	
Heavy Duty Fist Microphone	RMN5111_	x	x	x	x	x

Table 18: Motorcycle Enclosures

Accessory	Part Number	M1	M2	M3	M4	M5
Motorcycle Enclosure	HLN7021_				x	
Motorcycle Enclosure	HLN1445_				x	
Motorcycle Enclosure	HLN1446_				x	

Table 19: Mounting (Control Head)

Accessory	Part Number	M1	M2	M3	M4	M5
Remote Mount Trunnion Kit	PMLN4912_			x		
Motorcycle Mount Trunnion Kit	PMLN5092_				x	
DIN Mount Bracket	PMLN5093_			x		

Table 20: Mounting (Transceiver)

Accessory	Part Number	M1	M2	M3	M4	M5
High Profile Mounting Bracket	GLN7317_	x	x	x	x	x
Low Profile Mounting Bracket	GLN7324_	x	x	x	x	x
Mounting Frame to Install Transceiver in DIN-A Slot	PMLN5094_	x	x	x	x	x
Key Lock Mount	RLN4779_	x	x	x	x	x

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[1] Requires Junction Box, GMLN5089_.

[2] The Handset Speaker Microphone (HSM) can offer better suppression to chopper noise by switching the steel grounding clip inside the control head with the correspondent golden grounding clip. For details on how to make this switch, refer to the related instruction leaflet.

[3] The golden grounding clip used in this model is 4216931H01. See [2].

Table 21: Power Cables

Accessory	Part Number	M1	M2	M3	M4	M5
Argentina AC Cord	3085801L01		x			x
Power Cable, for use with GPN6145_	GKN6266_		x			x
US Linecord (3060665A04)	NTN7373_		x			x
Euro Linecord (3060665A05)	NTN7374_		x			x
UK Linecord (3002120F02)	NTN7375_		x			x
Brazil Power Cable	NNTN7720		x			x
Cable Assembly, for use with PMPN4055_ or PMPN4076_	PMKN4165_		x			x

Table 22: Power Cables (to Mobile Terminal)

Accessory	Part Number	M1	M2	M3	M4	M5
12 V Power Cable to Battery, 3 m with Fuse (10 A)	GKN6270_	x		x	x	
12 V Power Cable to Battery, 6 m with Fuse (10 A)	GKN6274_	x		x	x	
Ignition Sense Cable	PMKN4120_	x		x	x	

Table 23: Power Supplies

Accessory	Part Number	M1	M2	M3	M4	M5
Desktop Power Supply	GPN6145_		x			x
Desktop Power Supply	HPN4007_		x			x
Power Supply	PMPN4055_		x			x
Wedge Power Supply	PMPN4076_		x			x

Table 24: Programming/Data

Accessory	Part Number	M1	M2	M3	M4	M5
USB Programming Cable (Mobile Microphone Port)	HKN6184_	x	x	x	x	x
Active Data Cable[4]	PMKN4104_	x	x	x	x	
Programming Cable	PMKN4105_	x	x	x	x	
KVL Cable	PMKN4108_	x	x	x	x	x
USB Programming Cable (Terminal Rear Port)[5]	PMKN4110_	x	x	x	x	x

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[4] The cable, PMKN4104_, is only compatible when a Data Expansion Head Enhanced is not fitted as part of a remote mount configuration. In this configuration, access to the TETRA PEI for IP Packet Data and SDS services is available on the Data Expansion Head Enhanced and the Active Data Cable PMKN4104_ cannot be used.

[5] Used both for programming and data purposes.

Table 25: PTT Switches

Accessory	Part Number	M1	M2	M3	M4	M5
External Alarm Relay (PTO kit that contains GKN6272_ and PMLN5072_)	GMLN5091_	x	x	x	x	
Mobile Accessory Connector Kit[6] – junction box 26-pin plug	PMLN5072_	x	x	x	x	
External PTT with Emergency Footswitch (use together with a Junction Box)	RLN4836_	x	x	x	x	
Pushbutton with Remote PTT (use together with a Junction Box)	RLN4857_	x	x	x	x	
Gooseneck PTT (use together with a Junction Box)	RLN4858_	x	x	x	x	
Push Button PTT[1], for use with RMN5054_ or PMMN4087_	RLN5926_	x	x	x	x	x

Table 26: Speakers

Accessory	Part Number	M1	M2	M3	M4	M5
Speaker, 13 W[1]	GMSN4066_	x	x	x	x	x
Small Speaker, 5 W[1]	GMSN4078_	x	x	x	x	x
External Speaker, 13 W	RSN4002_	x	x	x	x	x
External Speaker, 7 W	RSN4003_	x	x	x	x	x
External Speaker, 5 W	RSN4004_	x	x	x	x	x
Speaker Extension Cable[1]	GMKN4084_	x	x	x	x	
Speaker Extension Cable	PMKN4119_	x	x	x	x	

> **CAUTION:**
> Complex installations requiring extended cable runs and Remote Mount Control Heads with Audio Accessories such as the Telephone Style Handset (HLN7016_) may benefit from careful routing of cables, and in some cases additional Electro Magnetic Compatibility (EMC) reduction techniques such as using Ferrite or Toroid accessories. Suitable examples of Ferrite or Toroid accessories are as follows:
>
> • Ferrite Clamp, Part Number 91012044001, 91012044002, or 91012044003
>
> • Toroid, Part Number 01015001001

2.6
MTM5500/ Accessories-to-Model Chart

Table 27: Antennas

Accessory	Part Number	M1	M2	M3	M4	M5
Antenna TETRA Magnetic Mount 380–400 MHz	GMAE4256_	x	x	x	x	x
Antenna TETRA Covert Strip Glass 380–400 MHz	GMAE4258_	x	x	x	x	x

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6 Keep the GCAI connector cover supplied with the new Control Head.

Accessory	Part Number	M1	M2	M3	M4	M5
Antenna TETRA Low Profile 380–400 MHz	GMAE4260_	x	x	x	x	x
Antenna TETRA Wall Mount 380–400 MHz	GMAE4262_	x	x	x	x	x
Antenna TETRA Motorcycle 380–400 MHz	GMAE4266_	x	x	x	x	x
Antenna Whip TETRA Flexible Hinged 380–400 MHz	GMAE4279_	x	x	x	x	x
Antenna Whip TETRA Hinged 380–400 MHz	GMAE4282_	x	x	x	x	x
Antenna Whip TETRA Hinged 380–430 MHz	GMAE4253_	x	x	x	x	x
Antenna TETRA Panel/Roof Mount 380–430 MHz	GMAE4255_	x	x	x	x	x
Antenna Whip TETRA Flexible Hinged 380–430 MHz	GMAE4281_	x	x	x	x	x
Antenna Whip TETRA Hinged 380–430 MHz	GMAE4284_	x	x	x	x	x
Antenna TETRA Glass Mount 410–430 MHz	GMAE4254_	x	x	x	x	x
Antenna TETRA Magnetic Mount 410–430 MHz	GMAE4257_	x	x	x	x	x
Antenna TETRA Covert Strip Glass 410–430 MHz	GMAE4259_	x	x	x	x	x
Antenna TETRA Low Profile 410–430 MHz	GMAE4261_	x	x	x	x	x
Antenna TETRA Wall Mount 410–430 MHz	GMAE4263_	x	x	x	x	x
Antenna TETRA Motorcycle 410–430 MHz	GMAE4267_	x	x	x	x	x
Antenna Whip TETRA Flexible Hinged 410–430 MHz	GMAE4280_	x	x	x	x	x
Antenna Whip TETRA Hinged 410–430 MHz	GMAE4283_	x	x	x	x	x
Antenna Motorcycle UHF 430–470 MHz	GMAE4268_				x	
Antenna Panel / Roof Mount 430–470 MHz	GMAE4271_	x	x	x	x	x
Antenna Magnetic Mount 430–470 MHz	GMAE4272_	x	x	x	x	x
Antenna Covert Glass Strip 430–470 MHz	GMAE4273_	x	x	x	x	x
Antenna Low Profile 430–470 MHz	GMAE4274_	x	x	x	x	x
Antenna Wall Mount 430–470 MHz	GMAE4275_	x	x	x	x	x
Antenna Whip Tetra Flexible Hinged 450 MHz	GMAE4285_	x	x	x	x	x
Antenna Whip Flex Tetra 450 MHz	GMAE4286_	x	x	x	x	x
Antenna Glass Mount 3dB 800 MHz	GMAF4409_	x	x	x	x	x
Antenna TETRA Glass Mount 0 dB 800 MHz	GMAF4410_	x	x	x	x	x
Antenna Panel Mount 800 MHz	GMAF4411_	x	x	x	x	x
Antenna Magnetic Mount 800 MHz	GMAF4412_	x	x	x	x	x
Antenna Magnetic Mount 3 dB 800 MHz	GMAF4413_	x	x	x	x	x
Antenna TETRA Covert 800 MHz	GMAF4414_	x	x	x	x	x
Antenna Low Profile 800 MHz	GMAF4415_	x	x	x	x	x
Antenna Wall Mount 800 MHz	GMAF4416_	x	x	x	x	x
Antenna TETRA Motorcycle 800 MHz	GMAF4417_				x	
Antenna Mount Panel/Roof thickness up to 4 mm	GMLN4276_	x	x	x	x	x
Antenna Mount Panel/Roof thickness up to 6 mm	GMLN4277_	x	x	x	x	x
Antenna Mount Magnetic	GMLN4278_	x	x	x	x	x

Table 28: Cables

Accessory	Part Number	M1	M2	M3	M4	M5
Spiral Cable Kit	0104047J66			x		
Accessories Expansion Cable, 2 m	GMDN3836			x	x	
Ignition Switch Cable	HKN9327_	x		x	x	
Remote Mount Cable (Terminal to Control Head), 10 m	PMKN4020_			x		
Remote Mount Cable (Terminal to Control Head), 3 m	RKN4077_			x		
Remote Mount Cable (Terminal to Control Head), 5 m	RKN4078_			x		
Remote Mount Cable (Terminal to Control Head), 7 m	RKN4079_			x		
Accessories Expansion Cable, 2.3 m	PMKN4029_			x	x	
Accessories Expansion Cable, 4 m	PMKN4056_			x	x	
Motorcycle Mount TELCO Cable, 2.3 m	PMKN4030_				x	
Rear Adaptor Cable	PMKN4118_			x		
RECH Y-Cable with Fuse (2 A)	PMKN4133_			x		
TSCH Y-Cable with Fuse (2 A)	PMKN4134_			x		
TETRA Mobile Ethernet Cable, 40 m	PMKN4135_			x		
TETRA Mobile Ethernet Cable, 15 m	PMKN4146_			x		
TETRA Mobile Ethernet Cable, 12 m	PMKN4136_			x		
TETRA Mobile Ethernet Cable, 10 m	PMKN4138_			x		
TETRA Mobile Ethernet Cable, 7 m	PMKN4139_			x		
TETRA Mobile Ethernet Cable, 5 m	PMKN4140_			x		
TETRA Mobile Ethernet Cable, 3 m	PMKN4141_			x		
TETRA Mobile to Mobile Ethernet Cable, 0.5 m	PMKN4176_			x		
TETRA Mobile to Mobile Ethernet Cable, 3 m	PMKN4177_			x		
TETRA Mobile to Mobile Ethernet Cable, 7 m	PMKN4178_			x		
Accessory Kit	PMLN6487_			x		

Table 29: Control Heads

Accessory	Part Number	M1	M2	M3	M4	M5
Ethernet Data Expansion Control Head	PMLN7009_			x		
IP67 Motorcycle Control Head, Roman Keypad	PMWN4002_				x	
IP67 Motorcycle Control Head, Arabic Keypad	PMWN4005_				x	
IP67 Motorcycle Control Head, Cyrillic Keypad	PMWN4007_				x	
Control Head, Roman Keypad	PMWN4009_	x	x			
Control Head, Arabic Keypad	PMWN4012_	x	x			
Control Head, Cyrillic Keypad	PMWN4014_	x	x			
Control Head, Hebrew Keypad	PMWN4016_	x	x			
Remote Mount Control Head, Roman Keypad	PMWN4017_			x		

Accessory	Part Number	M1	M2	M3	M4	M5
Remote Mount Control Head, Arabic Keypad	PMWN4020_			x		
Remote Mount Control Head, Cyrillic Keypad	PMWN4022_			x		
Ethernet Remote Control Head (eCH) Roman	PMWN4024_			x		
Ethernet Remote Control Head (eCH) Arabic	PMWN4036_			x		
Ethernet Remote Control Head (eCH) Cyrillic	PMWN4037_			x		
Ethernet Remote Control Head (eCH) Hebrew	PMWN4038_			x		
Ethernet Remote Control Head (eCH) Chinese	PMWN4039_			x		
Ethernet Remote Control Head (eCH) Taiwanese	PMWN4040_			x		
Ethernet Remote Control Head (eCH) Korean	PMWN4041_			x		
Ethernet Telephone Style Control Head (TSCH) Roman	PMWN4025_			x		
Ethernet Telephone Style Control Head (TSCH) Arabic	PMWN4030_			x		
Ethernet Telephone Style Control Head (TSCH) Cyrillic	PMWN4031_			x		
Ethernet Telephone Style Control Head (TSCH) Hebrew	PMWN4032_			x		
Ethernet Telephone Style Control Head (TSCH) Chinese	PMWN4033_			x		
Ethernet Telephone Style Control Head (TSCH) Taiwanese	PMWN4034_			x		
Ethernet Telephone Style Control Head (TSCH) Korean	PMWN4035_			x		

Table 30: Desktop and Data Box Mount

Accessory	Part Number	M1	M2	M3	M4	M5
Desktop Tray without Loudspeaker	GLN7318_		x			
Desktop Tray with Loudspeaker	RSN4005_		x			

Table 31: Dust Cover Kit

Accessory	Part Number	M1	M2	M3	M4	M5
Ethernet Port Dust Cover Kit (set of 2)	PMLN6344			x		

Table 32: Ferrites for Ethernet Control Head

Accessory	Part Number	M1	M2	M3	M4	M5
Assembly, Ferrite Beads	PMLN6488_			x		

Table 33: GPS

Accessory	Part Number	M1	M2	M3	M4	M5
Antenna Combined TETRA and GPS 350–390 MHz	PMAE4493_	x	x	x	x	x
Antenna Comb Tetra/GPS 380–430 MHz SMA	GMAE4507_	x	x	x	x	x

Accessory	Part Number	M1	M2	M3	M4	M5
Antenna Combined GPS 430–470 MHz	GMAE4269	x	x	x	x	x
Antenna Combined TETRA and GPS 430–470 MHz SMA	PMAE4269_	x	x	x	x	x
Antenna Combined Tetra and GPS 800 MHz	GMAF4408_	x	x	x	x	x
Antenna Combined TETRA and GPS 806–870 MHz SMA	PMAF4408_	x	x	x	x	x
Antenna GPS Panel / Roof Mount SMA	GMAG4253_	x	x	x	x	x
Antenna GPS Only Magnetic Mount SMA	GMAG4254_	x	x	x	x	x

Table 34: Handsets

Accessory	Part Number	M1	M2	M3	M4	M5
Telephone-Style Handset[7]	GMUN1006_	x	x	x	x	
IMPRES Telephone Style Handset Kit	MDHLN7016			x		
Kit, Telephone Handset Hardware	NNTN7214_	x	x	x	x	x
Kit, Telephone Handset Bracket	NNTN7232_	x	x	x	x	x

Table 35: Installation

Accessory	Part Number	M1	M2	M3	M4	M5
External Alarm Relay	GKN6272_			x		
Buzzer Kit	GLN7282_	x	x	x	x	
Accessory Connector Kit[7] – radio rear	HLN9457_			x		

Table 36: Junction Box

Accessory	Part Number	M1	M2	M3	M4	M5
Data Junction Box with Accessory Connector	GMLN5089_	x	x	x	x	
Cable 6 m Transceiver to Junction Box[7]	PMKN4101_	x	x	x	x	
Cable 4 m Transceiver to Junction Box[7]	PMKN4102_	x	x	x	x	
Cable 2 m Transceiver to Junction Box[7]	PMKN4103_	x	x	x	x	

Table 37: Label Identification for Telephone Style Control Head

Accessory	Part Number	M1	M2	M3	M4	M5
Color code (white) bag of five	PMLN6335_	x	x	x	x	x
Color code (green) bag of five	PMLN6336_	x	x	x	x	x
Color code (red) bag of five	PMLN6337_	x	x	x	x	x
Color code (yellow) bag of five	PMLN6338_	x	x	x	x	x
Color code (blue) bag of five	PMLN6339_	x	x	x	x	x

Table 38: Microphones

Accessory	Part Number	M1	M2	M3	M4	M5
Fist Microphone with a Clip[7]	GMMN4063_	x	x	x		x
Visor Mounted Microphone Headset	GMMN4065_	x	x	x	x	x
BMI Hearer Speaker Microphone[8]	PMMN4070_	x[9]	x	x[9]	x	x
Hearer Speaker Microphone with Earphone Jack and Emergency Button	PMMN4086_	x	x	x	x	x
Visor Mounted Microphone	PMMN4087_	x	x	x	x	x
Smart Visor Microphone	RMN5054_	x	x	x	x	x
Desktop Microphone, Mobile Microphone Port	RMN5106_	x	x	x		
Compact Fist Microphone with a Clip	RMN5107_	x	x	x	x	
Heavy Duty Microphone	RMN5111_	x	x	x	x	x

Table 39: Mounting (Control Head)

Accessory	Part Number	M1	M2	M3	M4	M5
Remote Mount Trunnion Kit	PMLN4912_			x		
Motorcycle Mount Trunnion Kit	PMLN5092_				x	
DIN Mount Bracket	PMLN5093_			x		
Slim Mounting Bracket Kit, for use with TSCH	PMLN6346_			x		

Table 40: Mounting (Transceiver)

Accessory	Part Number	M1	M2	M3	M4	M5
High Profile Mounting Bracket	GLN7317_	x	x	x	x	x
Low Profile Mounting Bracket	GLN7324_	x	x	x	x	x
Mounting Frame to Install Transceiver in DIN-A Slot	PMLN5094_	x	x	x	x	x
Key Lock Mount	RLN4779_	x	x	x	x	x

Table 41: Power Cables

Accessory	Part Number	M1	M2	M3	M4	M5
Power Cable, for use with GPN6145_	GKN6266_		x			x
US Linecord (3060665A04)	NTN7373_		x			x
Euro Linecord (3060665A05)	NTN7374_		x			x
UK Linecord (3002120F02)	NTN7375_		x			x

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[7] Requires Junction Box, GMLN5089_.

[8] The Handset Speaker Microphone (HSM) can offer better suppression to chopper noise by switching the steel grounding clip inside the control head with the correspondent golden grounding clip. For details on how to make this switch, refer to the related instruction leaflet.

[9] The golden grounding clip used in this model is 4216931H01. See [8].

Accessory	Part Number	M1	M2	M3	M4	M5
Cable Assembly, for use with PMPN4055_ or PMPN4076_	PMKN4165_		x			x

Table 42: Power Cables (to Mobile Terminal)

Accessory	Part Number	M1	M2	M3	M4	M5
12 V Power Cable to Battery, 3 m with Fuse (10 A)	GKN6270_	x		x	x	
12 V Power Cable to Battery, 6 m with Fuse (10 A)	GKN6274_	x		x	x	
Ignition Sense Cable	PMKN4120_	x		x	x	

Table 43: Power Supplies

Accessory	Part Number	M1	M2	M3	M4	M5
Desktop Power Supply	GPN6145_		x			x
Desktop Power Supply	HPN4007_		x			x
Power Supply	PMPN4055_		x			x
Wedge Power Supply	PMPN4076_		x			x

Table 44: Programming/Data

Accessory	Part Number	M1	M2	M3	M4	M5
USB Programming Cable, for use with TSCH	25-124330-01_	x	x	x	x	x
USB Programming Cable (Mobile Microphone Port)	HKN6184_	x	x	x	x	x
Active Data Cable[10]	PMKN4104_	x	x	x	x	
Programming Cable	PMKN4105_	x	x	x	x	
KVL Cable	PMKN4108_	x	x	x	x	x
USB Programming Cable (Terminal Rear Port)[11]	PMKN4110_	x	x	x	x	x

Table 45: PTT Switches

Accessory	Part Number	M1	M2	M3	M4	M5
External Alarm Relay (PTO kit that contains GKN6272_ and PMLN5072_)	GMLN5091_	x	x	x	x	
Mobile Accessory Connector Kit – junction box 26-pin plug	PMLN5072_	x	x	x	x	
External PTT with Emergency Footswitch (use together with a Junction Box)	RLN4836_	x	x	x	x	

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[10] The cable, PMKN4104_, is only compatible when a Data Expansion Head Enhanced is not fitted as part of a remote mount configuration. In this configuration, access to the TETRA PEI for IP Packet Data and SDS services is available on the Data Expansion Head Enhanced and the Active Data Cable PMKN4104_ cannot be used.

[11] Use both for programming and data purposes.

[12] Keep the GCAI connector cover supplied with the new Control Head.

Accessory	Part Number	M1	M2	M3	M4	M5
Pushbutton with Remote PTT (use together with a Junction Box)	RLN4857_	x	x	x	x	
Gooseneck PTT (use together with a Junction Box)	RLN4858_	x	x	x	x	
Push Button PTT[7], for use with RMN5054_ or PMMN4087_	RLN5926_	x	x	x	x	x

Table 46: Speakers

Accessory	Part Number	M1	M2	M3	M4	M5
Speaker, 13 W[7]	GMSN4066_	x	x	x	x	x
Small Speaker, 5 W[7]	GMSN4078_	x	x	x	x	x
External Speaker, 13 W	RSN4002_	x	x	x	x	x
External Speaker, 7 W	RSN4003_	x	x	x	x	x
External Speaker, 5 W	RSN4004_	x	x	x	x	x
Speaker Extension Cable[7]	GMKN4084	x	x	x	x	x
Speaker Extension Cable	PMKN4119_	x	x	x	x	x

> ⚠ **CAUTION:**
> Complex installations requiring extended cable runs and Remote Mount Control Heads with Audio Accessories such as the Telephone Style Handset (HLN7016_) may benefit from careful routing of cables, and in some cases additional Electro Magnetic Compatibility (EMC) reduction techniques such as using Ferrite or Toroid accessories. Suitable examples of Ferrite or Toroid accessories are as follows:

- Ferrite Clamp, Part Number 91012044001, 91012044002, or 91012044003
- Toroid, Part Number 01015001001

Chapter 3

Vehicle Preparation

General Guidelines for Radio Installation

Install this product in a vehicle according to the vehicle manufacturer guidelines and the instruction detailed in this manual. Use only the Motorola Solutions parts specified in this manual.

This radio is designed and certified for terrestrial use only.

An accessory connector at the rear of the radio enables you to attach different accessories (see Accessory Connection Plan on page 89).

A mobile microphone port at the front control head panel provides the connection for various types of microphones.

You can install the radio in a vehicle, using one of these methods:

- Using the direct mounting trunnion and power cables supplied with a standard radio package.
- Remote mounted in the car radio cut-out (using the required din mounting kit PMLN5094), per ISO7736.
- Two types of the remote mount.

The radio should be mounted horizontally near the driver, so the driver can easily view, access, and operate the controls, microphone (location of the microphone clip), and other accessories. Before installation, consider the following factors:

- Ensure that the location for the radio installation is not exposed to dirt and moisture.
- Verify that the space around the mobile unit is sufficient for air flow and installation.
- Check that there is enough routing space for the power cable connector and the antenna coaxial cable.
- To minimize pinching, crushing, and overheating of wires and cables, plan the best place to run connections.
- In a vehicle with an airbag, make sure that the mounting location of the radio, or of any radio accessory, is not in the deployment path of the air bag.

Power Supply Requirements

This radio uses a standard 12 V power supply connection. In vehicles with 24 V power supply, a DC/DC converter is required. Use only DC/DC converter vendors, who provide a certification for vehicle installation and meet radio power supply specification. Motorola Solutions recommends a suitable range of DC/DC converters available from Alfatronix LTD UK. Some models are also available through Motorola Solutions Service Organization. Check with your account manager for more information.

If it is not possible to add a DC/DC converter, keep the supply voltage of the radio at a level of 10.5 V or above regardless of the battery condition of the vehicle.

When planning the installation, be aware that the maximum current consumption is 4.5 A during PTT and up to 30 mA (non-Ethernet)/90 mA (Ethernet) when the radio is switched off. For power supply specification, see Model Specifications on page 19.

For low supply voltage, consider the following factors:

- If the supply voltage measured on the power supply terminal of the radio drops below 10.5 V for more than 500 ms, the radio displays `Battery Low`.

- If the supply voltage measured on the power supply terminal of the radio drops below 9.7 V for more than 500 ms, the radio displays `Battery Empty` then turns off.

- For vehicles exposed to heavy electrical load such as ambulances and fire trucks, add a backup battery supply separated from the electrical installation.

- A radio that turns off due to low supply voltage conditions remains in boot loader mode. When the supply voltage rises enough, the radio consumes over 500 mA of power supply. This condition might drain a weak or old battery which is left overnight or for a longer time in low temperatures. Recharge the battery using an external charger. To trigger the power-up sequence, the ignition pin voltage must go below 3.1 V and rise again above 9.7 V.

3.2
Uninstalling the Radio

Procedure:

1 Before uninstalling the radio:

    a Switch off the radio.

    b Wait for a minimum of 4 seconds after the radio switch is released.

    c Disconnect the 13.2 V main power supply.

2 Alternatively, turn off the main power supply without switching OFF the radio.

3.3
Installing DC Power Cable

⚠ **CAUTION:** This radio must be operated only in negative ground electrical systems. Operating the radio on a positive ground system causes the cable fuse to short-circuit. Check the vehicle ground polarity before you begin the installation.

Procedure:

1 Determine a routing plan, keeping in mind where to mount the radio as well as the following factors:

    a Whenever possible, avoid routing the cable above the catalytic converter.

    b Make sure that the power cable never rests on sharp edges.

    c Use grommets whenever a cable has to pass through a hole in a metal panel.

    ⚠ **CAUTION:** Improper handling with the power cable may cause shorting to ground. Ensure that during radio installation the power cable fuse is removed. Make sure that your power cable is not placed with the antenna in parallel. Interference can cause radio to hang.

2 Locate an existing hole with the grommet in the vehicle fire wall, or use a 9.5 mm (3/8-inch) bit to drill an access hole in the fire wall. To protect the power cable, install a grommet with a 5 mm (3/16-inch) inside diameter into the hole.

    ⚠ **CAUTION:** Be careful not to damage existing wires.

3 From inside the vehicle, feed the red and black leads (without the lugs attached) through the access hole and into the engine compartment.

Figure 1: Power Cabling Routing to Engine Compartment
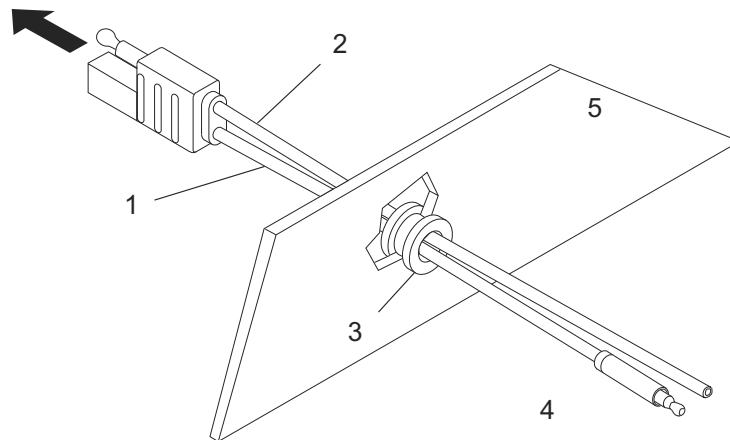
FL0830246-O

Number	Description
1	Red lead
2	Black lead
3	Grommet
4	Engine Compartment
5	Firewall

4 Connect the black lead of the DC power cable to the nearest vehicle chassis ground point (using the provided ring lug if necessary). Shorten the black lead to remove any excess cable.

> **NOTICE:** Locate a good vehicle ground point. The vehicle frame provides the best ground. Optimum radio performance can only be achieved with a low-resistance ground connection. Verify that the connections between the battery negative terminal, vehicle chassis, and engine block have low resistance.

Figure 2: Power Cable Assembly
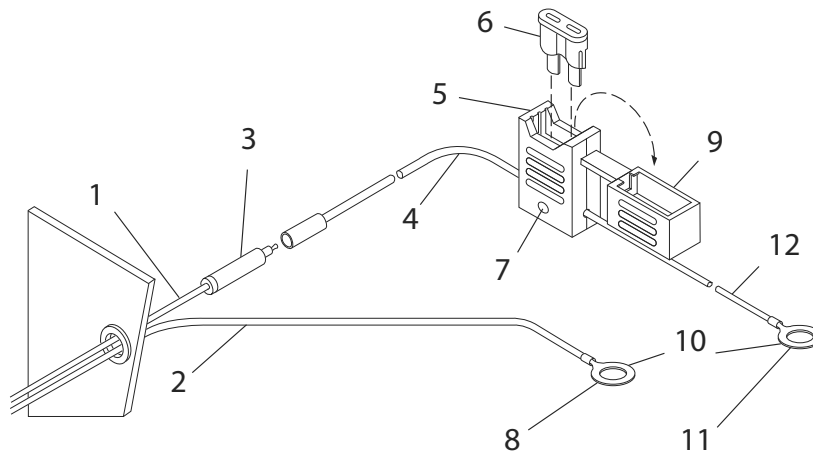
1FL08302470

Number	Description
1	Red lead
2	Black lead (min. 2,5 mm)
3	Adapter
4	Red lead (min. 2,5 mm)
5	Fuse holder
6	Fuse (10A)
7	Mounting hole
8	To battery (-) or chassis
9	Cover
10	Ring lugs
11	To battery (+)
12	Red lead (min. 2,5 mm)

5 Place the fuse holder close to the battery. Ensure that it is not near any hot engine component. Mount the fuse holder using its mounting hole and dress the wires as required.

6 Insert the stripped end of the red lead of the fuse holder into the ring lug hole and crimp it. Connect the fuse holder red adapter lead plug to the mating receptacle on the red lead of the power cable.

7 Connect the red lead ring lug from the fuse holder to the positive (+) battery terminal. Make sure that the adapter cable is connected to the main power cable red lead.

8 Carefully check that all connections are proper. Insert the fuse into the fuse holder and close the cover.

Postrequisites: See the following table for power cables available for this radio.

3.3.1
DC Power Cables

Table 47: DC Power Cables

Number	Description	Rating
GKN6270_	Power Cable to battery with fuse 10 A	12 V Power Cable to Battery, Length: 3 m
GKN6274_	Power Cable to battery with fuse 10 A	12 V Power Cable to Battery, Length: 6 m
6500139767	Fuse 10 A for Power Cable	
6580283E02	Fuse 4 A for Ignition Sense Cable	
6505663R02	Fuse 2 A for Y-Cable	

⚠️ **CAUTION:** In cases of blown fuses, replace only with fuses of identical value. Never insert ones of different values.

🖉 **NOTICE:** For more information on ignition cables, see section "Installing Ignition Sense Cable". The Ignition Sense Cable allows the radio to be turned on and off by the vehicle ignition switch.

3.4
Installing Ignition Sense Cable

The PMKN4120_ Ignition Sense Cable allows the terminal to be turned on and off by the vehicle ignition switch.

⚠️ **CAUTION:** In cases of blown fuses, replace only with fuses of identical value. Never insert ones of different values. Ensure that the fuse is removed during cable installation.

Procedure:

1 Plug the lead of the Ignition Sense Cable with the crimped on the terminal into #25 socket of the accessory plug.

2 Route and secure the cable with the attached tie wrap.

3 Connect the other lead of the accessory cable to the ignition switch of the vehicle.

4 Insert the fuse into the fuse holder and close the cover.

Figure 3: Accessory Plug
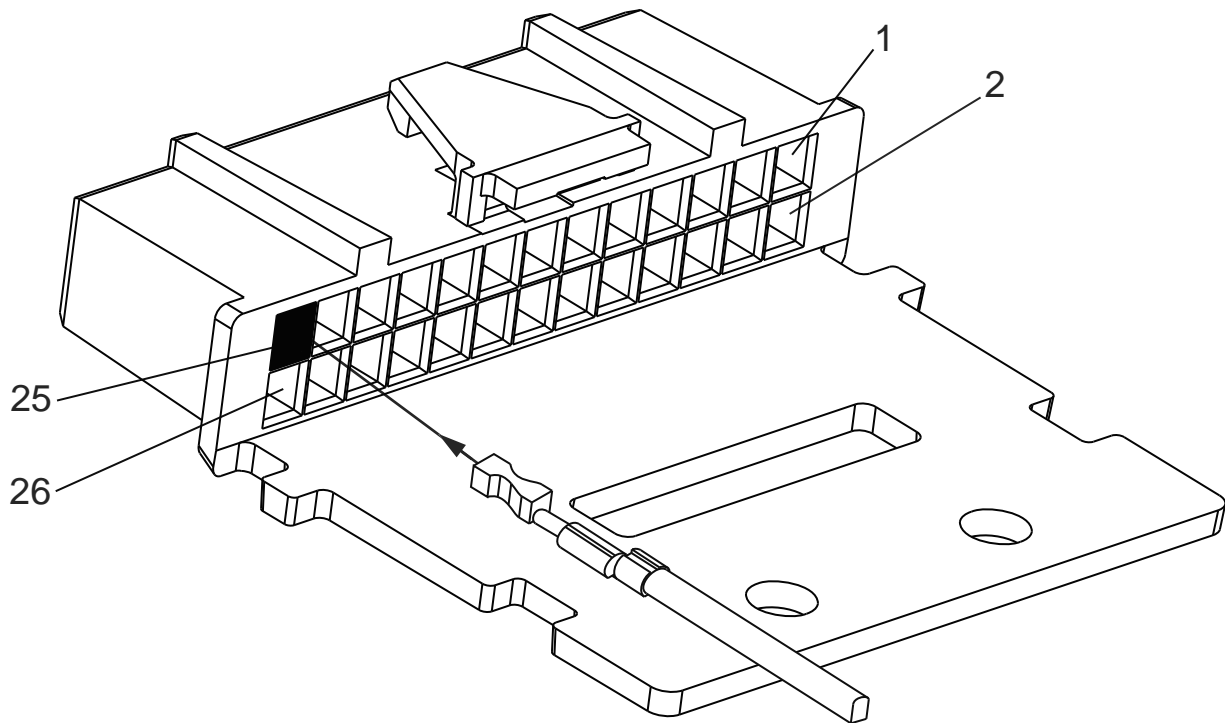
> ⚠ **CAUTION:** If the ignition line is not used, it MUST be grounded. Interference can cause radio to hang.

> 📝 **NOTICE:**
> The terminal accepts a 12 V or 24 V input for the Ignition Sense line. For 24 V installations, convert the main supply from 24 V to 12 V. For information, see General Guidelines for Radio Installation on page 35. Motorola Solutions recommends a suitable range of DC/DC converters available from Alfatronix LTD UK. Some models are also available through Motorola Solutions Service Organization, check with your Account Manager.

The ignition sense cable kit contains a thin cable and a fuse holder.

3.4.1
Ignition Sense Cables

Table 48: Ignition Sense Cables

Number	Description	Rating
PMKN4120_	Ignition Sense Cable with fuse 4 A	Ignition Sense Cable, Length: 3 m
6580283E02	Fuse 4 A for Ignition Sense Cable	

Chapter 4

Radio Installation

4.1
Dashboard Installation

This section explains Dashboard Installation — M1.

4.1.1
Installing the Radio in an Automotive Dashboard

Procedure:

1 Open out the radio cut-out (DIN Slot) in the dashboard.

2 Remove the top plastic cover off the radio.

3 Insert the mounting frame into the cut-out and retain it by bending back the relevant fixing tabs, using all six where possible, to hold it in place.

> **NOTICE:**
> The tabs are easily bent back by twisting a large flat-bladed screwdriver into the slot behind the tabs.
>
> For more secure installation, the top and rear of the frame should also be secured with screws.
>
> The demount tool can be used as an aid to mounting as well as demounting.

4.1.2
Mounting the Radio in the Frame

Procedure:

1 Provide the electrical connections to the radio for power, antenna, and accessories.

2 Plug in all the connectors and push the radio with its Remote Head Enhanced, or alternatively the Data Expansion Head Enhanced, firmly onto the mounting frame until the two springs snap into place.

> **NOTICE:** The fixing tabs should be checked for tightness each time the radio is removed. The tabs are easily tightened by twisting a large flat-bladed screwdriver in the slot behind the tabs. The frame is not designed for daily mounting and demounting.

Figure 4: Radio with Mount Kit
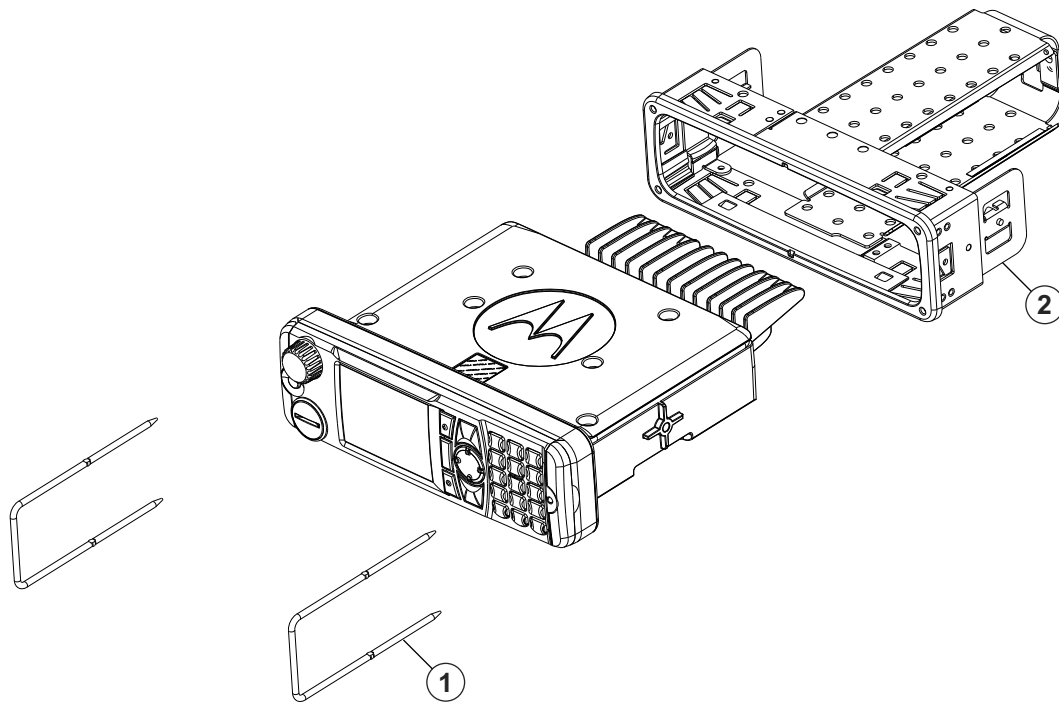
| Number	Description
1	Demount Tool (8166514A01) – included in DIN Mount Kit
2	Din Mount Kit PMLN5094_ (includes Demount Tool)

4.1.3
Removing the Radio from the Frame

Procedure:

1 Remove both rubber side caps from the Enhanced Control Head.

2 Insert the demount tool into the two openings.

3 Push the demount tools through the openings in the frame.

4 Slide out the radio.

Figure 5: Radio with Demount Tools
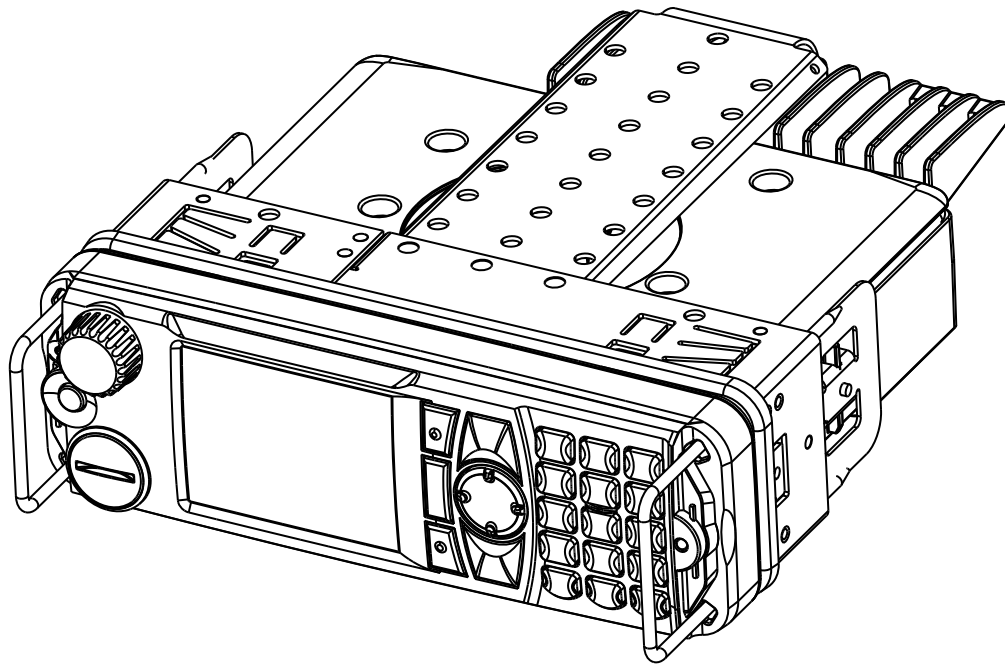
4.2
Desktop Installation

The Desktop Station option provides the terminal with the desk microphone, power supply, desk top tray (without a speaker), and external loudspeaker.

> ⚠️ **CAUTION:** If an outdoor antenna is used a proper grounded Lightning Protector with Quarter-Wave Shorting Stub must be inserted between the outdoor antenna and the transceiver antenna input. The line voltage power supply shall have a proper ground connection (see IEC61312-1). The installation must meet the requirements of any applicable local codes and regulations.

4.2.1
Desktop Installation Planning

Planning is the key to fast, easy terminal installation. Before a hole is drilled or a wire is run, inspect the location and determine how and where you intend to mount the antenna, terminal, and accessories. Plan wire and cable runs to provide maximum protection from pinching, crushing, and overheating. Only competent personnel, able to ensure that the complete installation fulfils its regulatory requirements, such as EMC (Electro Magnetic Compatibility) and IEC (International Electrotechnical Commission) can plan the installation.

## 4.2.2
Desktop Installation

When and where to use: Follow these steps to install the desktop station.

Procedure:

1 Be sure that line voltage power is available.

2 Make sure that sufficient air can flow around the terminal to permit adequate cooling.

3 Choose a flat surface for the desktop tray and external loudspeaker.

4 Be sure that the mounting surface is able to adequately support the weight of the terminal and tray.

5 In an outdoor antenna, choose a location for the terminal as close as possible to the antenna cable inlet of the building. Make sure that the installation of the surge protector is in accordance with the manufacturer specifications and safety hints. The line voltage power supply shall be grounded properly.

Figure 6: Typical Desktop Mounting
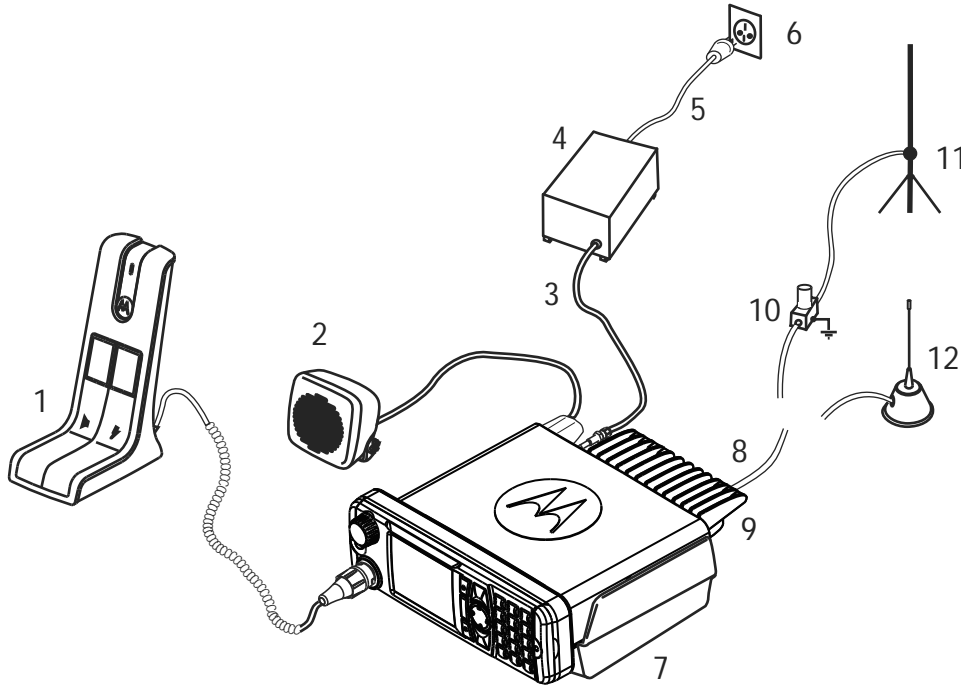
Number	Description	Part Number
1	Desk Microphone	RMN5106_
2	Loudspeaker	RSN4002_, RSN4003_, or RSN4004_
3	DC Power Cable	GKN6266_ or PMKN4165_ (for use with PMPN4055_ or PMPN4076_)
4	Power Supply	GPN6145_, HPN4007_, PMPN4055_, or PMPN4076_
5	Line Cord with Ground	
6	Wall Outlet	
7	Desktray or Desktray with inbuilt Loudspeaker	GLN7318_ or RSN4005_
8	Antenna Cable	
9	Antenna Connector BNC	
10, 11, 12	Typical Antennas: Lighting Protector with Quarter-Wave Shorting Stub, Outdoor Antenna, Indoor Antenna	

Table 49: Associated Components

| Item	Description	Part Number
1	Desktop Microphone	RMN5106_
2	External Speaker, 13 W	RSN4002_
3	External Speaker, 7 W	RSN4003_
4	Small Loudspeaker, 5 W	RSN4004_
5	Desktop Tray w/o speaker	GLN7318_
6	Desktop Power Supply Unit or Power Supply 14V 15A UNI 117/240 VAC	GPN6145_ or HPN4007_
7	Power Supply	PMPN4055_ or PMPN4076_
8	Power Cable (power supply to desktop mobile)	GKN6266_
9	Cable Assembly (for use with PMPN4055_ and PMPN4076_)	PMKN4165_
10	Lightning Protector with Quarter-Wave Stub Protector in the appropriate frequency range	

4.3
MTM5200/MTM5400 Remote Mount Installation

There are two types of remote mount installations:

- Remote Mount Installation with standard Expansion Head PMLN4904_
- Remote Mount Installation with Data Expansion Head PMLN4908_

Figure 7: Remote Mount Installation with Remote Head Enhanced/Data Expansion Head Enhanced
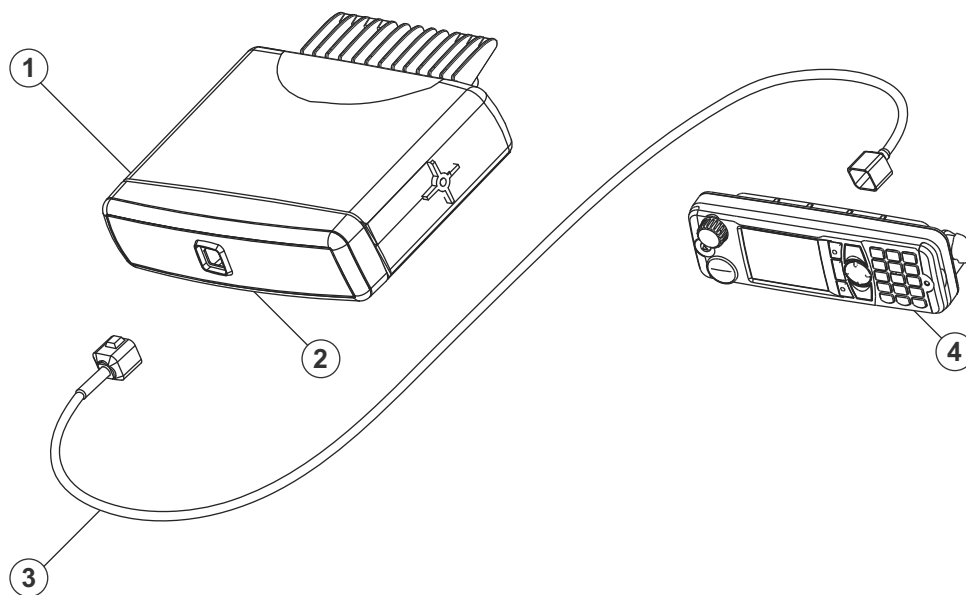
Number	Description
1	Transceiver

Number	Description
2	Remote Expansion Head PMLN4904_ **NOTICE:** Possible use of Data Expansion Control Head Enhanced PMLN4908_.
3	Cable Expansion Head to Control Head
4	Remote Mount Enhanced Control Head

Table 50: Associated Components for Remote Mount

Item	Description	Part Number
1	Remote Mount Cable – 3 m, 5 m, 7 m, 10 m	RKN4077_, RKN4078_, RKN4079_, PMKN4020_
2	Remote Head Enhanced or Data Expansion Head Enhanced	PMLN4904_ or PMLN4908_

NOTICE:

Vehicle installations require attention to the effects of EMC and over long cable runs additional protection may be required. Motorola Solutions has suitable suppression kits such as Part Number 01015001001 Toroid EMC Suppression Kit.

Wind the Remote Mount Cable ten times around each toroid.

Place each toroid 30.0±2.5 cm respectively from the expansion head and the control head.

Winding at both ends reduces the effective cable length approximately by 0.8 m.

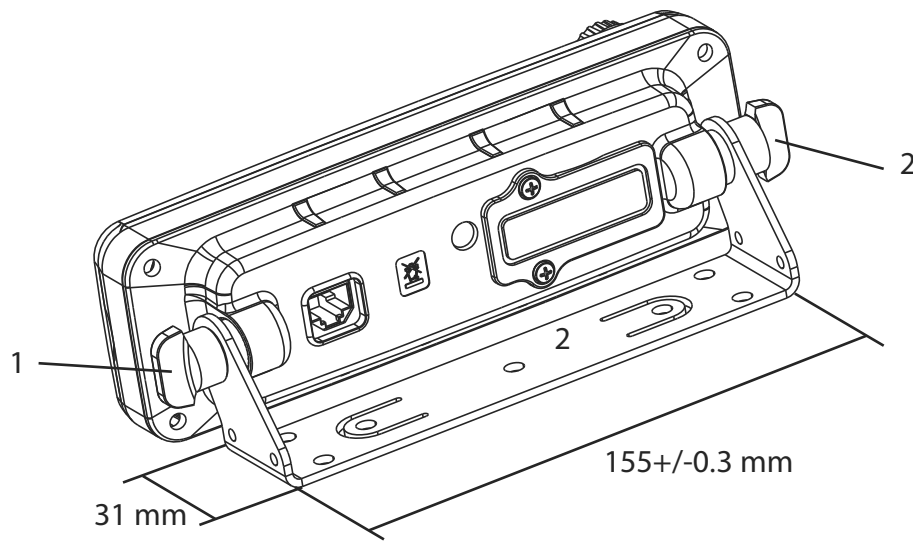Fix the toroids firmly to a stable surface once the Remote Mount Cable is connected.

4.3.1
Installing the Remote Mount Enhanced Control Head onto the Remote Mount Trunnion

When and where to use: Follow these steps to install the Remote Mount Enhanced Control Head onto the Remote Mount Trunnion.

Procedure:

1 Slide the Remote Mount Enhanced Control Head onto the mounting trunnion until it snaps into place.

2 Tighten the screws at both sides of the trunnion. After a few turns, tilt the control head for an optimum view of the display. Then, complete the tightening of the screws.

Figure 8: Remote Mount Enhanced Control Head Installation with Remote Mount Trunnion

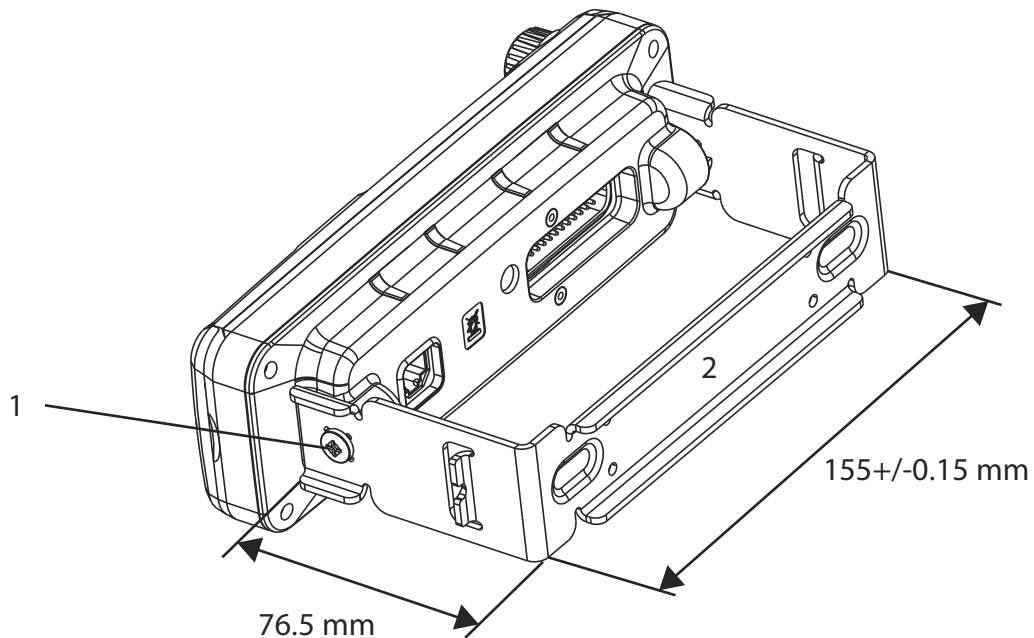1 and 2 – Remote Mount Trunnion Kit (PMLN4912)

4.3.2

Installing the Remote Mount Enhanced Control Head in a DIN Mount Bracket

When and where to use: Follow these steps to install the Remote Mount Enhanced Control Head in a DIN Mount Bracket.

Procedure:

1   Slide the Remote Mount Enhanced Control Head onto the DIN Mount Bracket until it snaps into place.

2   Tighten the screws at both sides of the DIN Mount Bracket.

Figure 9: Remote Mount Enhanced Control Head Installation with DIN Mount Bracket

1 and 2 – DIN Mount Bracket Kit (PMLN5093)

4.3.3
Inserting the Remote Mount Enhanced Control Head with the DIN Mount Bracket into the DIN Frame

When and where to use: Follow these steps to insert the remote mount enhanced control head with the DIN mount bracket.

Procedure:

1 Insert the mounting frame into the DIN Mount Bracket and retain it by bending back the relevant fixing tabs.

2 Use all six tabs, if necessary, to hold it in place.

   NOTICE:
   The tabs are easily bent back by twisting a large flat-bladed screwdriver into the slot behind the tabs.

   For a more secure installation, the top and rear of the frame should also be secured with screws.

   The demount tool can be used as an aid to mounting as well as demounting.

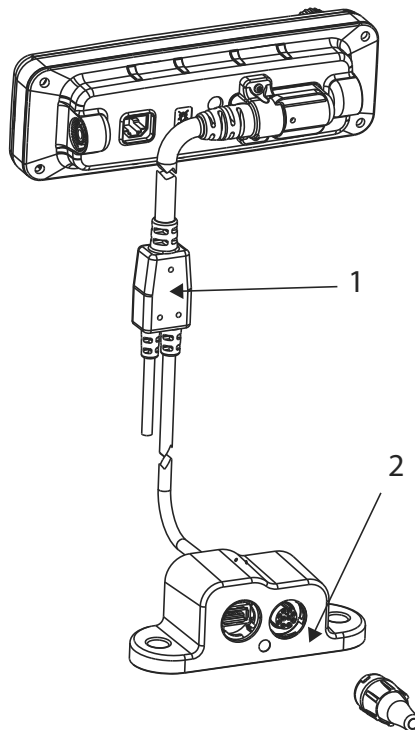**Figure 10: Radio with Mounting Bracket and Mounting Kit**
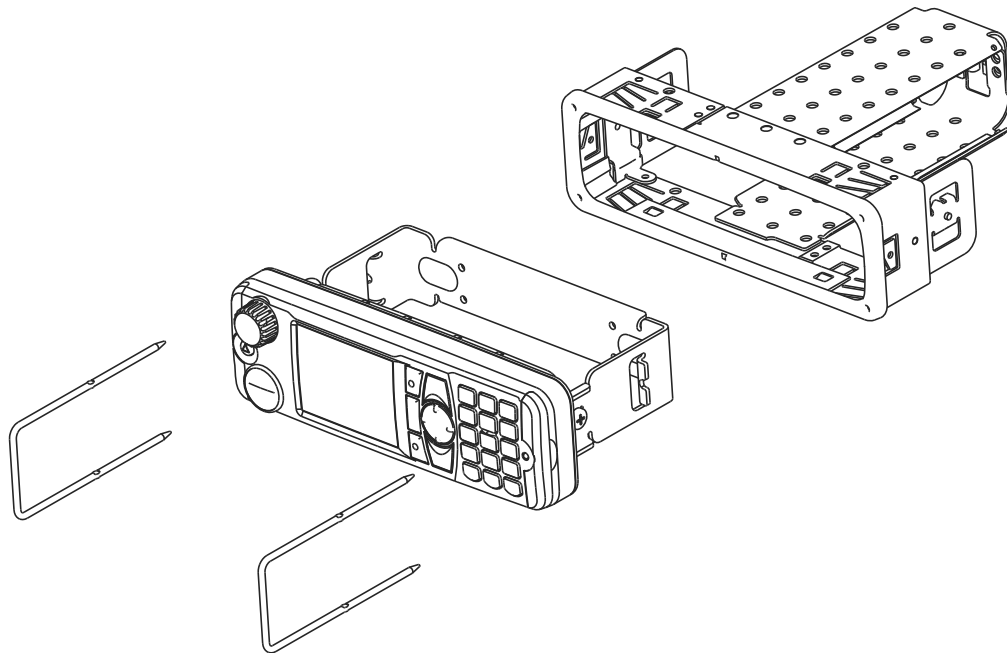
4.3.4
Adding Extra Accessories to the Remote Head by Expansion Cable

The Accessories Expansion Cable (PMKN4029_) allows the radio to have extra accessories using the Mobile Microphone Port (MMP).

Figure 11: Accessories Expansion Cable with the Mobile Microphone Port (MMP)

Number	Description
1	Accessories Expansion Cable PMKN4029_/PMKN4056_
2	Mobile Microphone Port

4.3.5
Installing the Accessories Expansion Cable

When and where to use: Follow these steps to install the accessories expansion cable.

Procedure:

1 Plug in the Accessories Expansion Cable to the subD Port of the Remote Mount Enhanced Control Head.

2 To secure the Accessories Expansion Cable in place, tighten the screws at the subD connector.

3 The Mobile Microphone Port (MMP)/USB port module can be mounted to various surfaces. To fix it securely in place, tighten the two screws at both sides of the module.

> **NOTICE:** For more information on the connector pin functions of the Accessories Expansion Cable and the Mobile Microphone Port (MMP)/USB Port Module, see section " Remote Mount Enhanced Control Head/Motorcycle Mount Enhanced Control Head-to-Accessories (Accessories Expansion Cable)".

4.4
MTM5500 Remote Mount Installation

The following are the possible configurations of MTM5500:

- Remote Mount installation with Ethernet Control Head (eCH)
- Remote Mount installation with Ethernet Telephone Style Control Head (TSCH)
- Dual Control Head with two eCH
- Dual Control Head with two TSCH
- Dual Control Head with a combination of eCH and TSCH
- Multi-Radio Control installation with eCH
- Multi-Radio Control Installation with TSCH

Table 51: MTM5500 Configurations – Graphics Description

Number	Description
1	MTM5500 Transceiver
2	Ethernet Expansion Head – PMLN7009_
3	Telephone Style Control Head (TSCH), Roman – PMWN4025_
4	Ethernet Control Head (eCH) Roman – PMWN4024_
5	Ferrite Clamps – 91012044001
6	Mobile Ethernet Cable, 5 m – PMKN4140_
7	Mobile Ethernet Cable, 3 m – PMKN4141_
8	Mobile to Mobile Ethernet Cable, 3 m – PMKN4177_

IMPORTANT:
All Ethernet cables shown in the following illustrations require three ferrite clamps, Part Number 91012044001, with two turns of wire around them. Manually install the first ferrite clamp approximately 60 cm away from the Control Head and with a minimum spacing of 3 cm between the next two ferrite clamps.

For single Control Head installation, connect the Control Head to port one of the Ethernet Expansion Head.

For Mobile-to-Mobile Ethernet Cables, connect the end of the cable marked EEH1 to Ethernet port one of one transceiver and connect EEH2 to Ethernet port two of another transceiver.

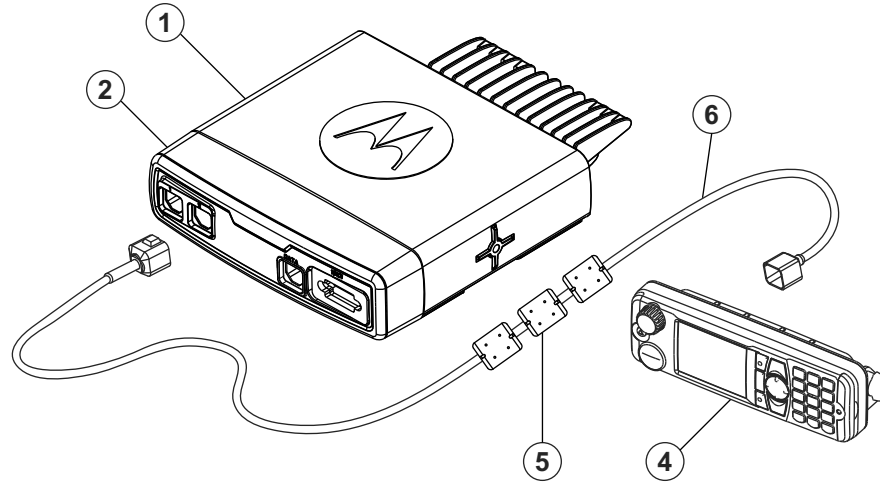**Figure 12: Remote Mount Installation with Ethernet Control Head (eCH) PMWN4024_**

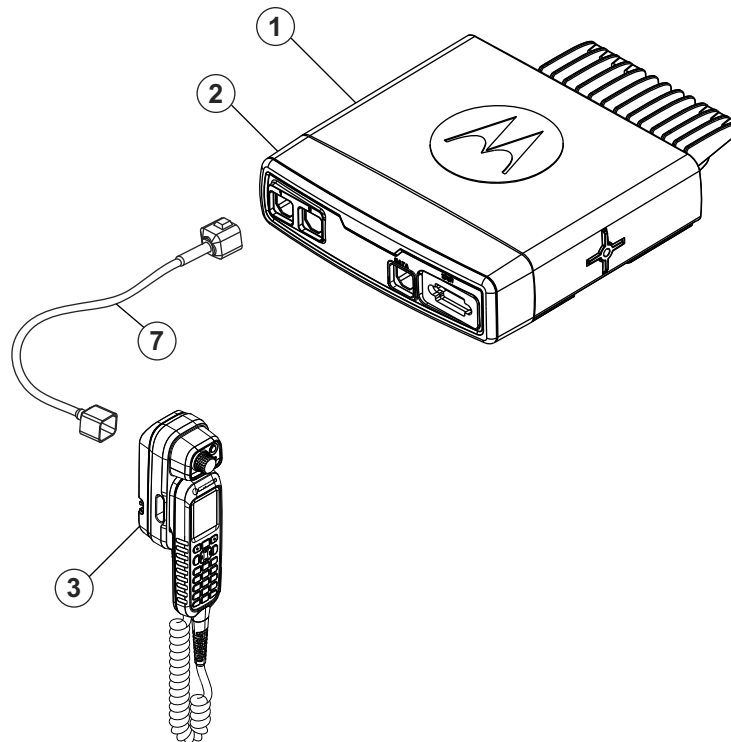**Figure 13: Remote Mount Installation with Ethernet Telephone Style Control Head (TSCH) PMWN4025_**

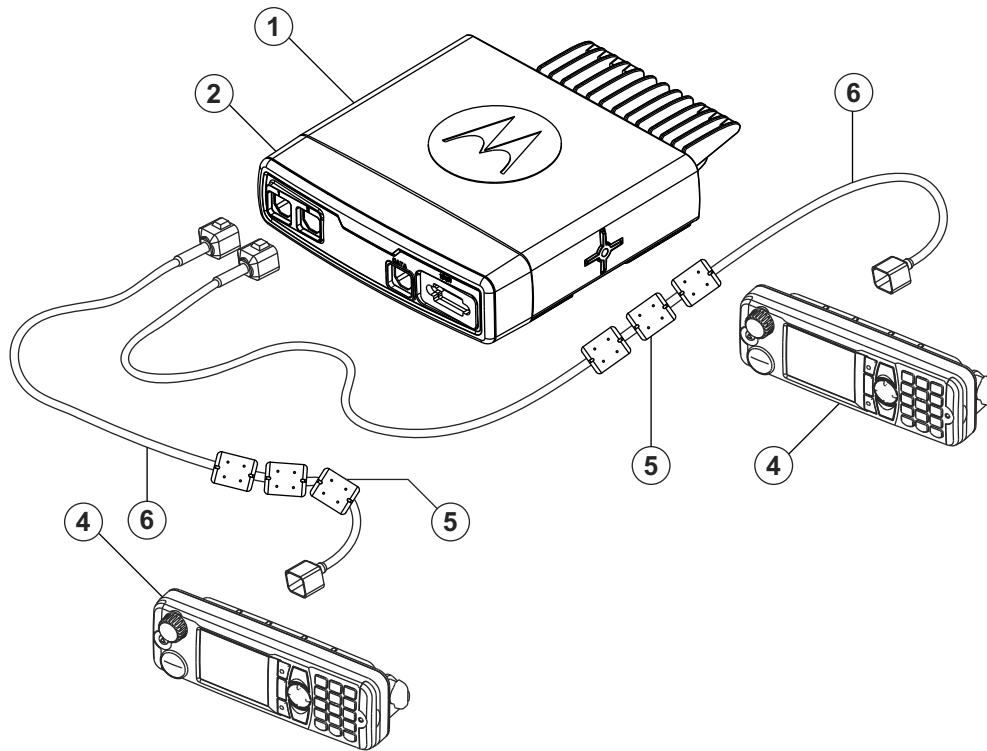**Figure 14: Dual Control Head with Two eCH**

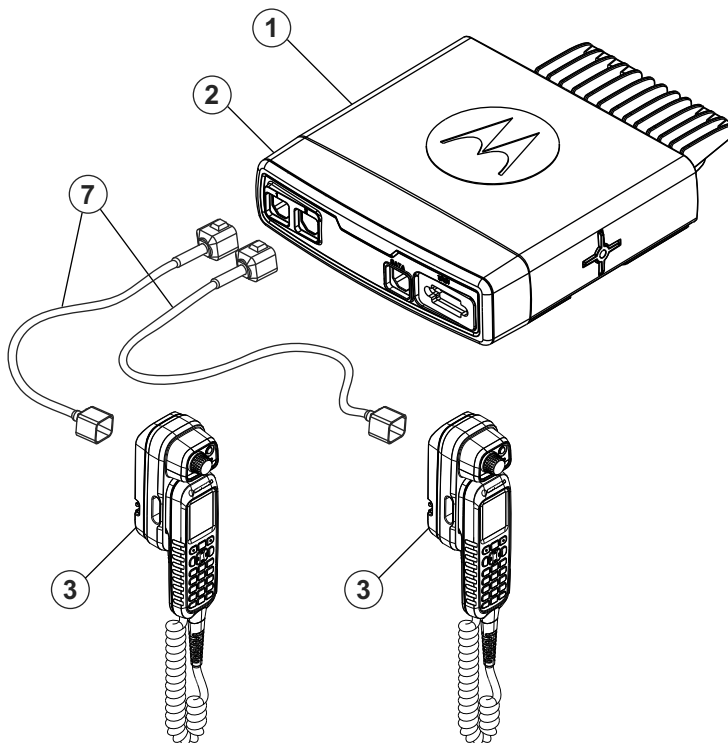**Figure 15: Dual Control Head with Two TSCH**

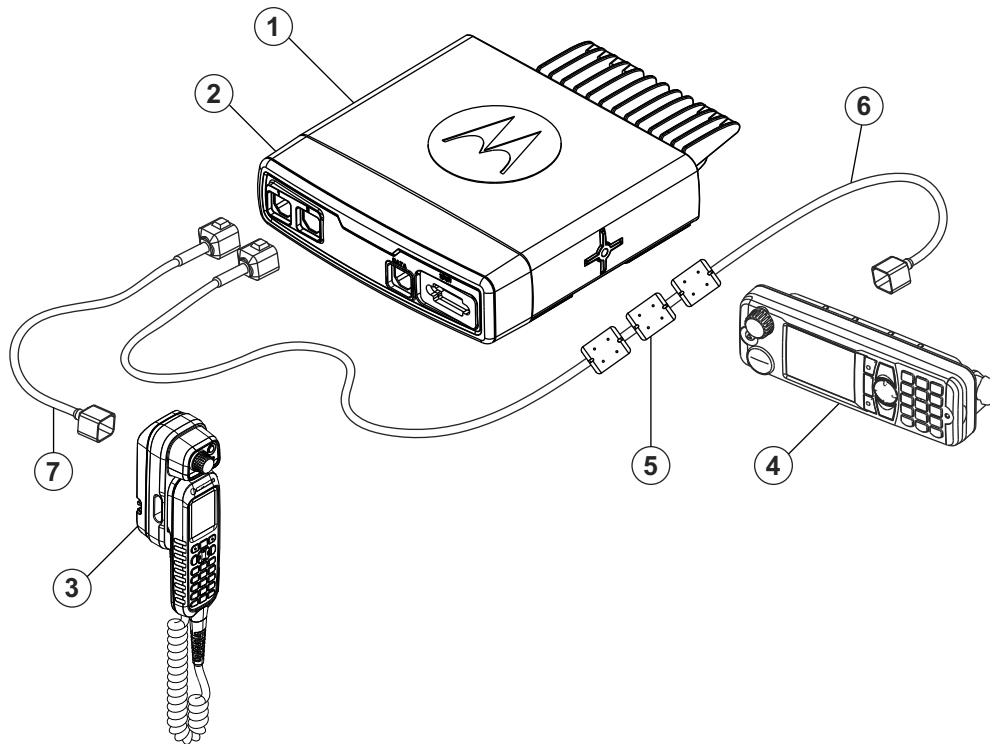**Figure 16: Dual Control Head with a Combination of eCH and TSCH**

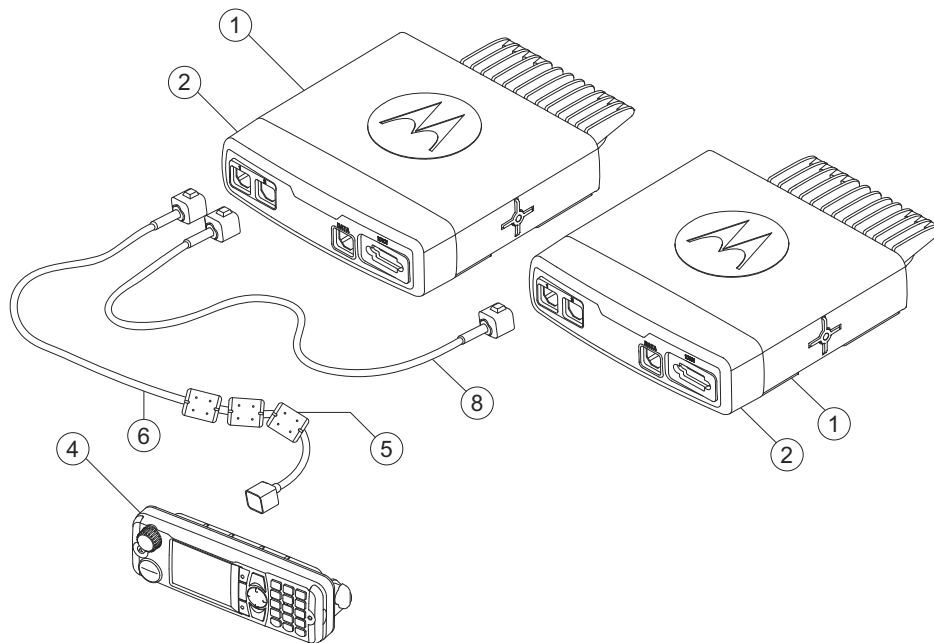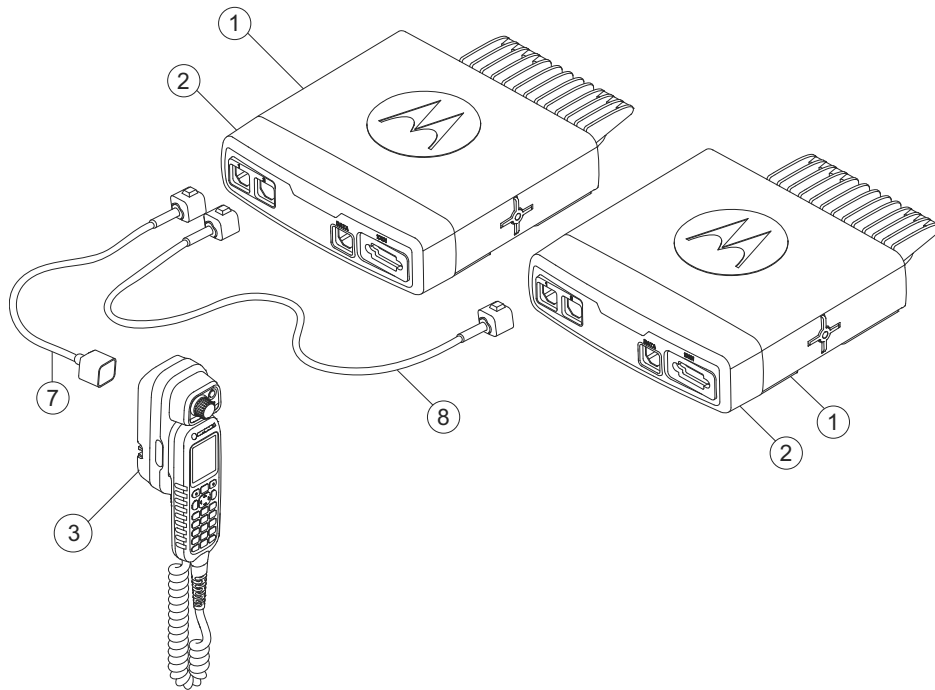**Figure 17: Multi-Radio Control Installation with eCH**

Figure 18: Multi-Radio Control Installation with TSCH

> **IMPORTANT:** If you are typing a message on one Control Head, key presses (except Emergency) are ignored on the other Control Head. Besides, it is possible to turn off the radio using the Power Off button of the inactive Control Head.

> **NOTICE:** For Multi-Radio Control installations, the Emergency Hot Mic and Ambience Listening functions require a Visor Microphone to be connected to the rear of each radio.

4.4.1
Ethernet Cables

> **WARNING:** Ethernet Expansion Heads are only compatible with Ethernet Remote Heads. Do not combine Ethernet Control Head with non-Ethernet Control Head. Also, ensure use of proper Ethernet cables to connect the Ethernet Expansion Head with TSCH, eCH or to another Ethernet Expansion Head. If not connected properly, the transceiver can be broken.

Table 52: Ethernet Cables

Item	Part Number
TETRA Mobile Ethernet Cable, 3 m	PMKN4141_
TETRA Mobile Ethernet Cable, 5 m	PMKN4140_
TETRA Mobile Ethernet Cable, 7 m	PMKN4139_
TETRA Mobile Ethernet Cable, 10 m	PMKN4138_
TETRA Mobile Ethernet Cable, 12 m	PMKN4136_
TETRA Mobile Ethernet Cable, 15 m	PMKN4146_
TETRA Mobile Ethernet Cable, 40 m	PMKN4135_
TETRA Mobile to Mobile Ethernet Cable, 0.5 m	PMKN4176_
TETRA Mobile to Mobile Ethernet Cable, 3 m	PMKN4177_

Item	Part Number
TETRA Mobile to Mobile Ethernet Cable, 7 m	PMKN4178_

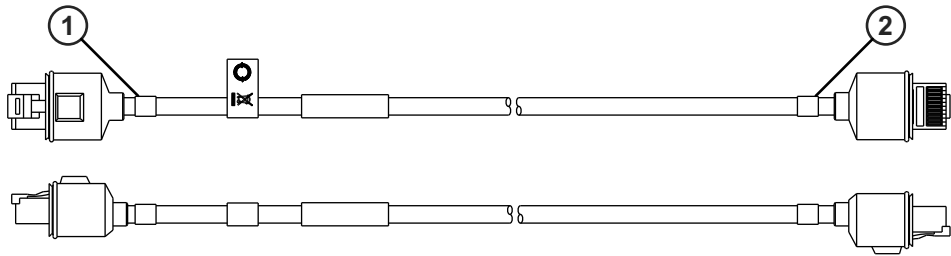**Figure 19: Ethernet Cable (PMKN4141_, PMKN4140_, PMKN4139_, PMKN4138_, PMKN4136_, and PMKN4146_)**

Figure 20: Ethernet Cable (PMKN4135_)

Figure 21: Ethernet Cable (PMKN4176_, PMKN4177_, and PMKN4178_)
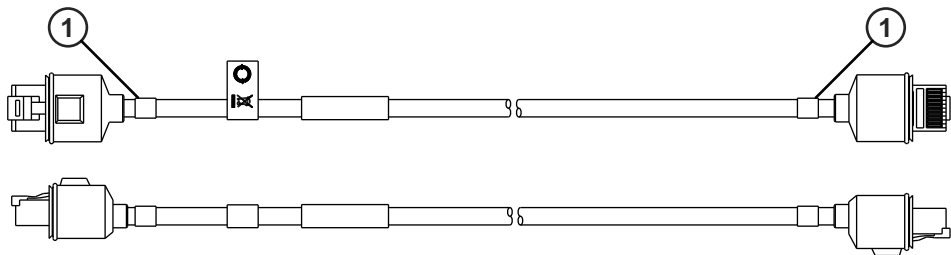
> **NOTICE:** For PMKN4135_, the open-end wire at the "CH" end shall be terminated with the in-box RJ50 plug based on the Ethernet Cable Pin Diagram. After routing the transceiver to the Control Head, use a 10P10C Crimping Tool to crimp the RJ50 plug to the open end of the cable.

Number	Description
1	EEH mark
2	CH mark

> **NOTICE:** Requires three (3) Ferrite Clamps, Part Number 91012044001. Manually install all Ethernet cables. Install clamps on the CH end of the cable with two turns of wire around each clamp.

> **WARNING:** Using the 'EEH' and 'CH' marks ensure that the Ethernet Cables are connected in the right way.

4.4.2
Installing the Remote Mount Ethernet Control Head (eCH) onto the Remote Mount Trunnion

When and where to use: Follow these steps to install the Remote Mount Enhanced Control Head onto the Remote Mount Trunnion.

Procedure:

1 Slide the Remote Mount Enhanced Control Head onto the mounting trunnion until it snaps into place.

2 Tighten the screws at both sides of the trunnion. After a few turns, tilt the control head for an optimum view of the display. Then, complete the tightening of the screws.

Figure 22: Remote Mount Enhanced Control Head Installation with Remote Mount Trunnion

155+/-0.3 mm

31 mm

1 and 2 – Remote Mount Trunnion Kit (PMLN4912_)

4.4.3
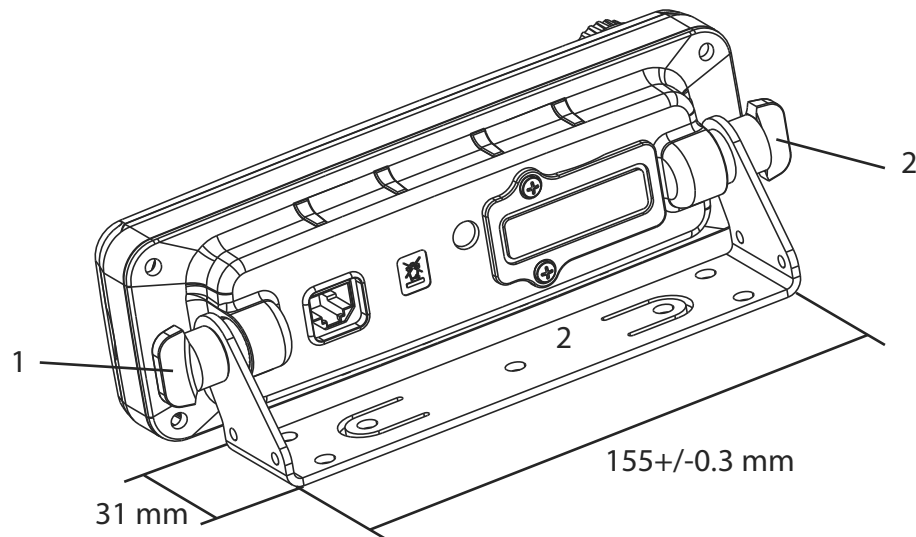# Installing the Remote Mount Ethernet Control Head (eCh) in a DIN Mount Bracket

When and where to use: Follow these steps to install the Remote Mount Enhanced Control Head in a DIN Mount Bracket.

Procedure:

1 Slide the Remote Mount Enhanced Control Head onto the DIN Mount Bracket until it snaps into place.

2 Tighten the screws at both sides of the DIN Mount Bracket.

Figure 23: Remote Mount Enhanced Control Head Installation with DIN Mount Bracket
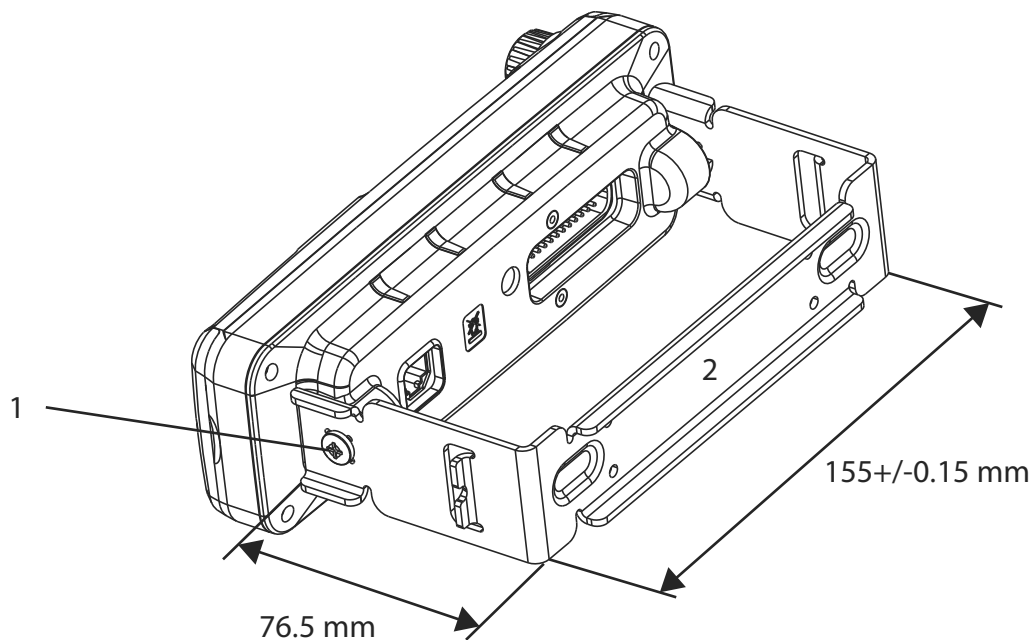
1 and 2 – DIN Mount Bracket Kit (PMLN5093_)

4.4.4
Inserting the Remote Mount Ethernet Control Head (eCH) with the DIN Mount Bracket into the DIN Frame

When and where to use: Follow these steps to insert the remote mount enhanced control head with the DIN mount bracket.

Procedure:

1   Insert the mounting frame into the DIN Mount Bracket and retain it by bending back the relevant fixing tabs.

2   Use all six tabs, if necessary, to hold it in place.

   NOTICE:
   The tabs are easily bent back by twisting a large flat-bladed screwdriver into the slot behind the tabs.

   For a more secure installation, the top and rear of the frame should also be secured with screws.

   The demount tool can be used as an aid to mounting as well as demounting.

Figure 24: Mounting the Remote Mount Enhanced Control Head with the DIN Mount Bracket into the DIN Frame
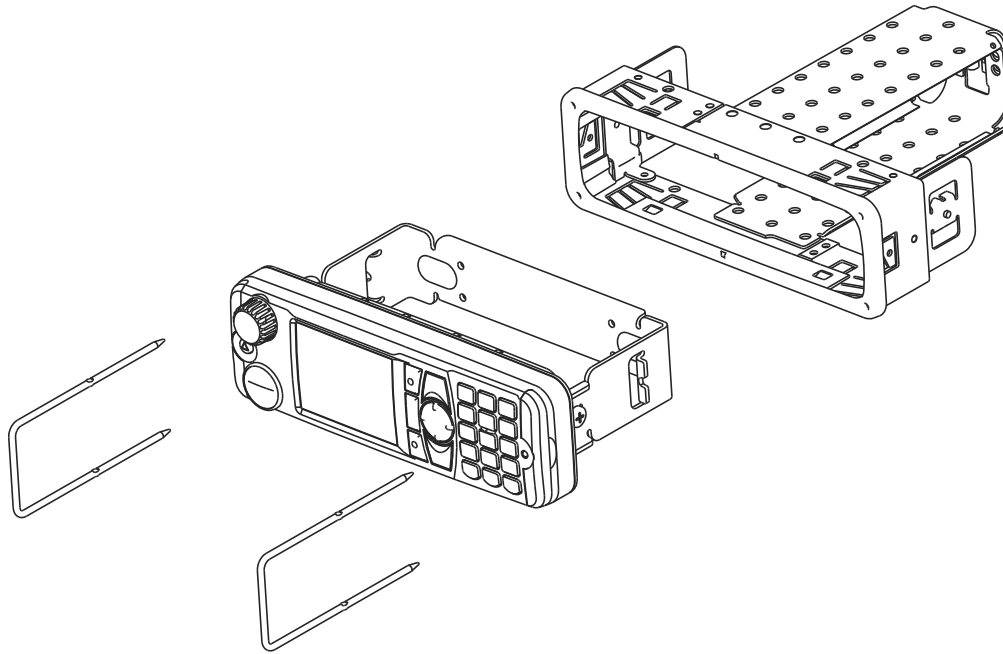
4.4.5
Adding Extra Accessories to the Ethernet Control Head (eCH) and Telephone Style Control Head (TSCH)

The Accessories Expansion RECH Y-Cable (PMKN4133_) allows you to connect extra accessories.

Figure 25: Accessories Expansion RECH Y-Cable

Number	Item
1	Ethernet Remote Head with the cable connected (by the D-25 Connector)
2	Ground Wire and External Power Wire, Input supply 12 V/24 V: 2A – These connections correspond to P4 and P5 detailed in Figure 72: RECH Y-Cable Pin Diagram on page 108 which provides the Pin Diagram of Cable PMKN4133. P4 is the 12/24V positive DC supply input and P5 is Ground. This supply is for the Audio Power Amplifier and is required to connect a Loudspeaker to the eCH. This is the only Power connection that allows 12 V or 24 V operation, all other Power supplies must be 12 V.
3	Speaker Wires – These connections correspond to P6 detailed in Figure 72: RECH Y-Cable Pin Diagram on page 108 and correspond to the Loudspeaker output of the

Number	Item
	eCH. The Audio Amplifier which supplies this output requires an independent DC Supply, refer to Number 2. The use of connector kit PMLN6487_ allows a plug and play installation of the associated Loudspeakers such as RSN4002_.
4	Free-end Wires – If used during installation, heat-shrink wrap unused wires to prevent shorting. These connections correspond to P3 detailed in Figure 72: RECH Y-Cable Pin Diagram on page 108. These connections provide multiple functions including Hands Free Microphone (HF1 and HF2) these two inputs are individually screened and include a common drain-Ground, PTT1 and PTT2, Power On, Rear Audio and the available GPIO lines. The use of Impres Visor Microphone RMN5054_ also requires the One Wire bus connection provided on this cable.
5	Rear GCAI Connector – These connections correspond to P2 detailed in Figure 72: RECH Y-Cable Pin Diagram on page 108 and this connector is the Ten (10) pin Rear GCAI Accessory connector which enables compatible Accessories such as the RMN5107_ Fist Microphone to be connected to the rear of the Control Head.
6	Ferrite Clamp, PN 91012044002. Manual installation is required. Clamps are installed with 2-turns of wire around the clamp.
7	Ferrite Clamp, PN 91012044003. Manual installation is required. Clamps are installed with 2-turns of wire around the clamp.
8	Fuse of 2A, PN 65012023001
9	Label for Y-cable power rating

> **NOTICE:**
> See Connectors and PIN Assignment on page 87 for wiring and pin out information.
>
> Manual installation required. Clamps are fixed with 2-turns of wire.

The Accessories Expansion TSCH Y-Cable (PMKN4134_) allows you to connect extra accessories.

Figure 26: Accessories Expansion TSCH Y-Cable

Number	Item
1	Telephone Style Control Head
2	Ground Wire and External Power Wire, Input supply 12 V/24 V: 2A. These connections correspond to P3 and P4 detailed in Figure 73: TSCH Y-Cable Pin Diagram on page 108 which provides the Pin Diagram of PMKN4134_. P3 is the 12/24V positive DC supply input and P4 is the Ground. This supply is for the Audio Power Amplifier and is required to connect a Loudspeaker is to the TSCH. Note this is the only Power connection that allows 12 V or 24 V operation all other Power supplies must be 12 V.
3	Speaker Wires – These connections correspond to P5 detailed in Figure 73: TSCH Y-Cable Pin Diagram on page 108 and correspond to the Loudspeaker output of the

Number	Item
	TSCH. The Audio Amplifier, which supplies this output, requires an independent DC Supply, refer to Number 2. The use of connector kit PMLN6487_ allows a plug and play installation of the associated Loudspeakers such as RSN4002_.
4	Free-end Wires – If used during installation, heat-shrink wrap unused wires to prevent shorting. These connections correspond to P2 detailed in Figure 73: TSCH Y-Cable Pin Diagram on page 108. These connections provide multiple functions including Hands Free Microphone PTT1 and PTT2, Emergency. The use of Impres Visor Microphone RMN5054_ also requires the One Wire bus connection provided on this cable.
5	Ferrite Clamp, PN 91012044002. Manual installation is required. Clamps are installed with 2-turns of wire around the clamp.
6	Ferrite Clamp, PN 91012044003. Manual installation is required. Clamps are installed with 2-turns of wire around the clamp. For easier installation on Free-end wires, insulation jacket should be removed.
7	Fuse of 2A, PN 65012023001
8	Label for Y-cable power rating

> **NOTICE:** Do not over torque the TSCH Y-cable screw. Recommended screw torque is 2.0+/-0.1 lb-in.

4.4.6
Telephone Style Control Head (TSCH)

The Ethernet Style Handset can be installed both horizontally and vertically. When installing the telephone style control head consider the wide viewing angle of the color display and the best direction to disengage the handset from the cradle. TSCH Handset and Cradle Part Number: PMWN4025_.

Figure 27: Telephone Style Control Head (TSCH) Cradle
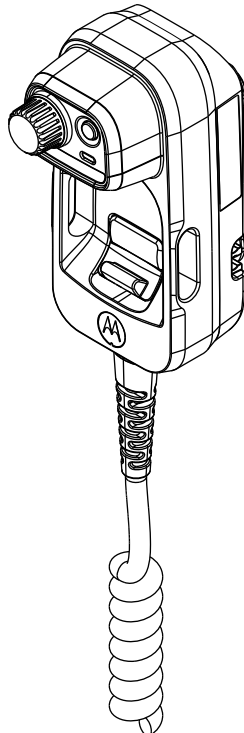
Figure 28: TSCH Handset and Cradle
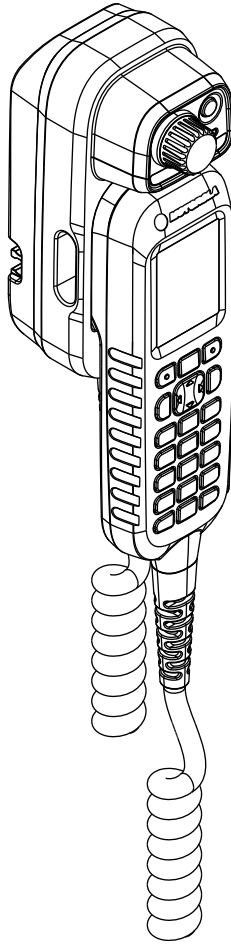
⚠️ **IMPORTANT:** Do not install the TSCH in the following ways.

Figure 29: TSCH Unsupported Installation
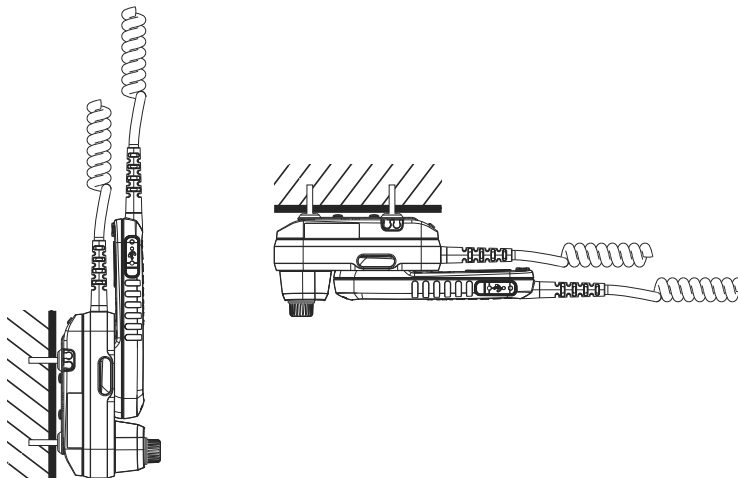
Mounting TSCH Cradle onto Slim Bracket

Procedure:

1 Place the bracket on intended location and tighten the four Screws (Motorola Solutions Part Number: 0312002B14) on screw holes as illustrated in the following picture.

Figure 30: Slim Bracket
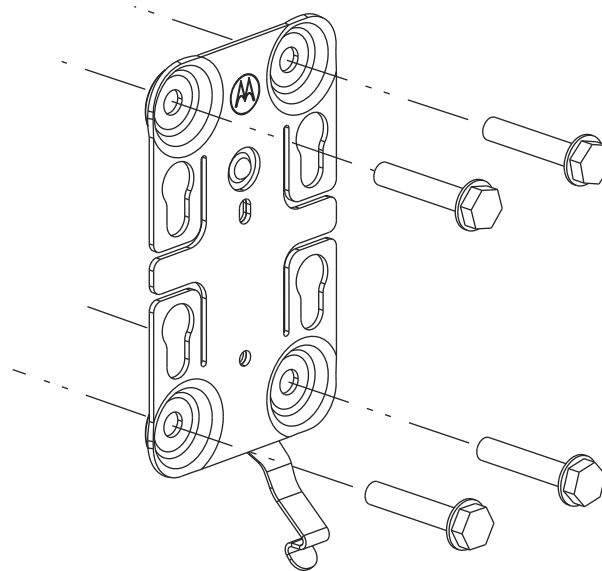
2 Tighten the four screws (Motorola Solutions Part Number: 03012069001) on four inserts of TSCH cradle as illustrated in the following picture with 5 lbf in (0.5649 Nm) screw torque.

Figure 31: Rear View of TSCH Cradle
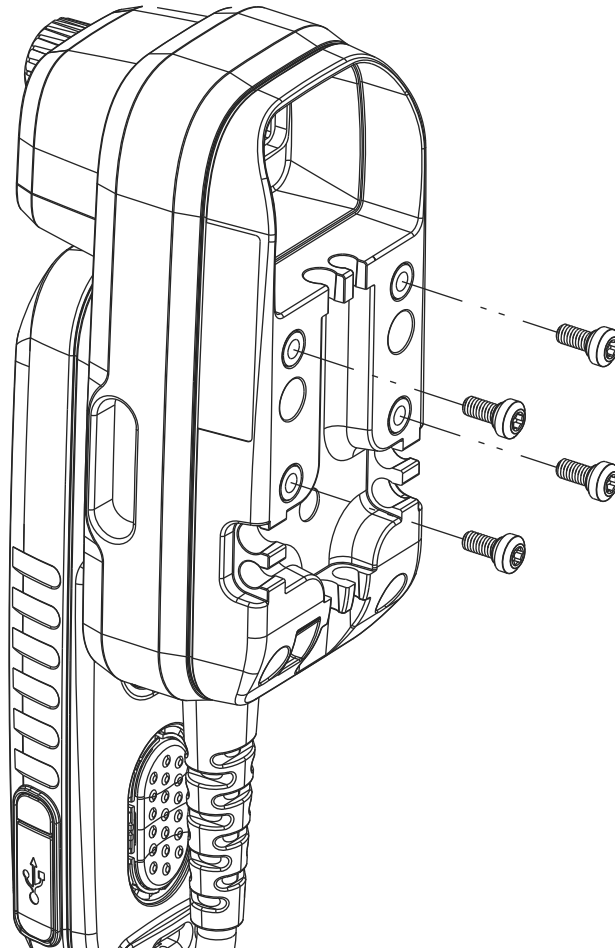
3 Slot the TSCH cradle into the Slim Bracket by aligning the four screws with the 'keyholes' on the bracket.

Figure 32: Rear View of the TSCH Cradle with Slim Bracket
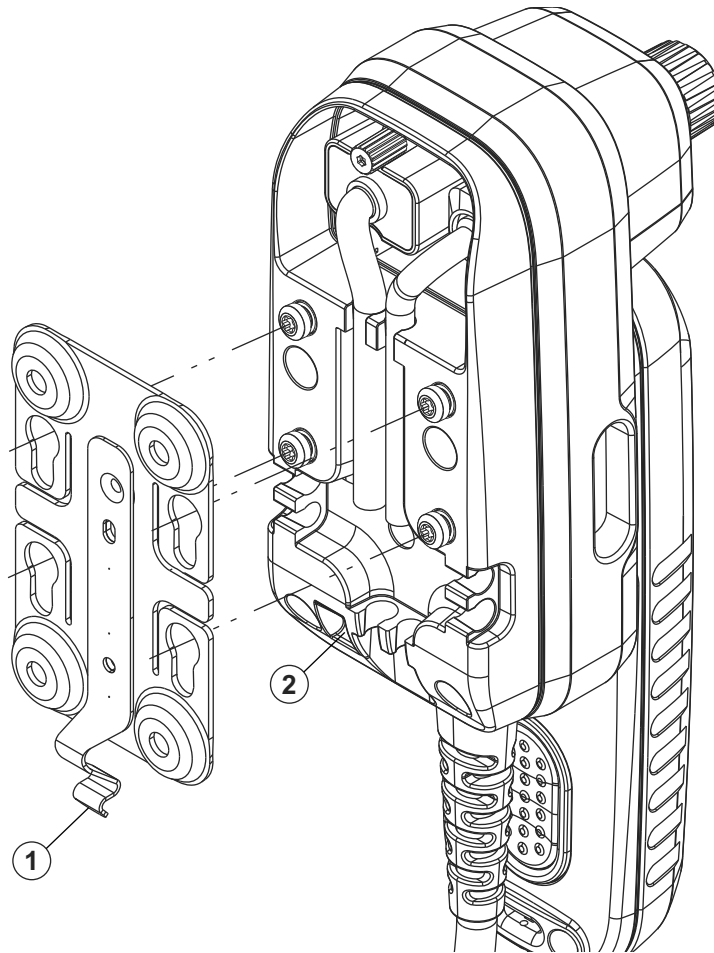
Number	Description
1	Bracket Hook
2	TSCH Cradle Locking Slot

4 Pull down the TSCH cradle until the Bracket Hook is fully engaged to the TSCH Cradle Locking Slot.

Figure 33: Rear View of the TSCH Cradle with Attached Slim Bracket
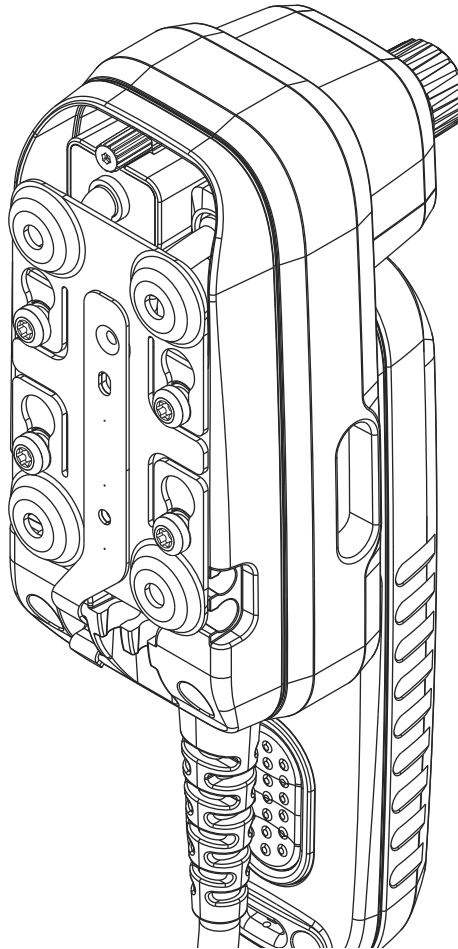
4.5
Motorcycle Mount Enhanced Control Head Installation

Motorola Solutions provides standard Motorcycle installation kits for a range of applications including four Button Handlebar Control with integrated Helmet Headset and true Covert installations.

The keypad labeling of the control head may vary according to the specific customer/country concerns.

Figure 34: Motorcycle Mount Enhanced Control Head - Front Side
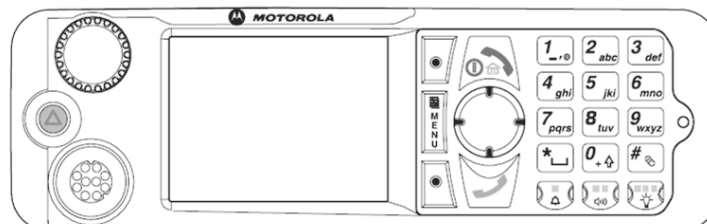
4.5.1

Installing Motorcycle Mount Enhanced Control Head

Planning is the key to fast, easy radio installation. Before a hole is drilled or a wire is run, inspect the vehicle and determine how and where you intend to mount the antenna, radio, and accessories. Plan wire and cable runs to provide maximum protection from pinching, crushing, and overheating.

> **NOTICE:** Only persons who are competent and able to ensure that the complete installation fulfils its regulatory requirements, such as ElectroMagnetic Compatibility (EMC) are allowed to plan the installation. Be sure that the distance from the antenna location on the transceiver enclosure is at least 30 cm or 1 foot to the motorcycle operator to assure compliance with RF Energy Safety standards. To assure that human exposure to radio frequency electromagnetic exposure is within the guidelines referenced in this document, transmit only when bystanders are at least the minimum distance (90 cm or 3 feet) from the motorcycle.

When and where to use: The following list of considerations should, as a minimum, be checked during installation planning:

Figure 35: Motorcycle Installation
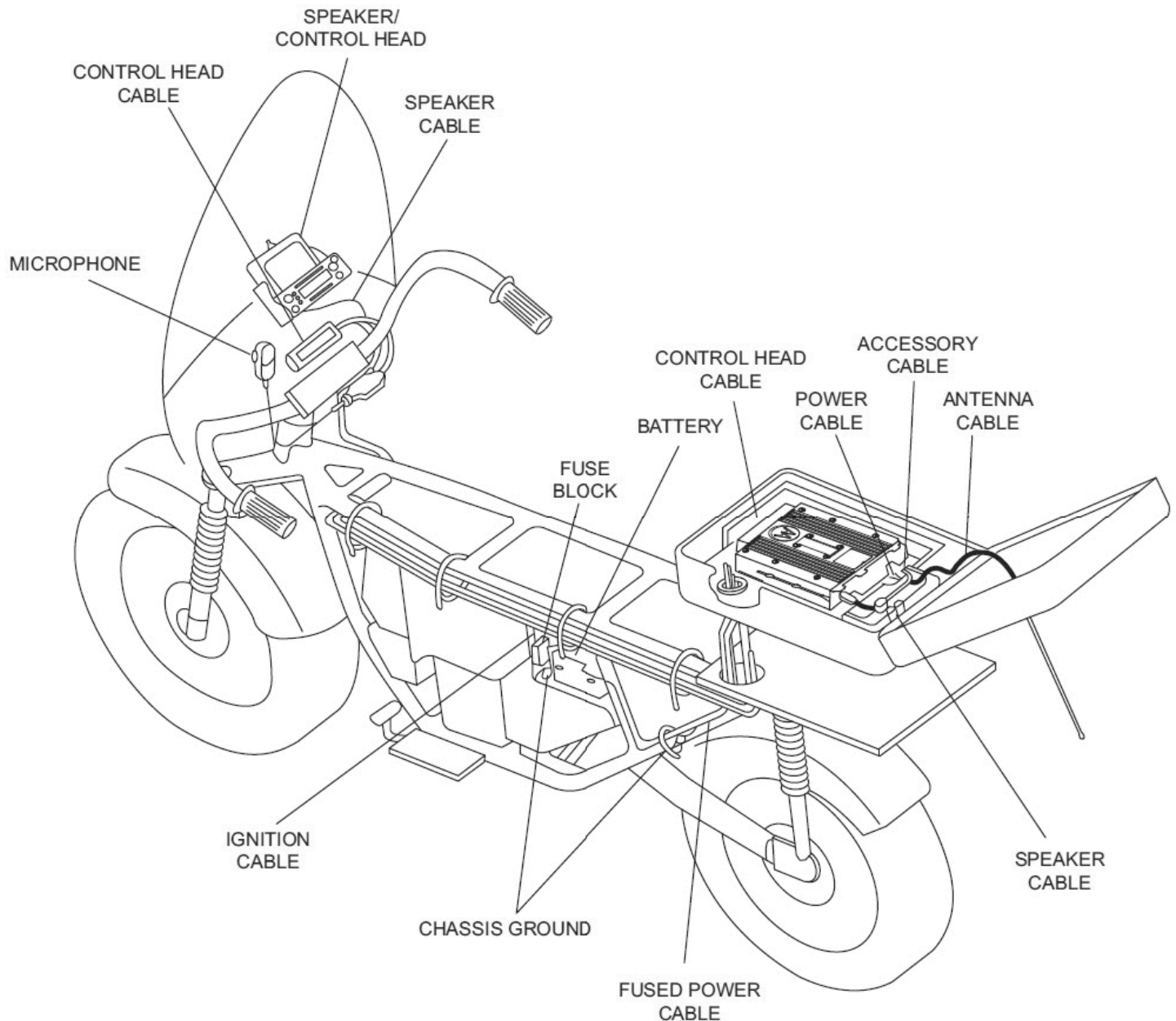
Procedure:

1 The recommended place for the transceiver is to place it in the box at the back of the motorcycle.

2 Mount the Motorcycle Mount Enhanced Control Head horizontally at a position which enables the driver to view the controls and operate them easily.

3 Be sure that the Motorcycle Mount Enhanced Control Head is close enough to the vehicle operator to permit easy access to operating controls.

4 Mount the Motorcycle Mount Enhanced Control Head directly on the chassis or handle part.

5 Ensure that the units mounted in the motorcycle box are protected from dirt and moisture.

6 Verify that there is sufficient space around the units to allow air flow and removal.

7 Verify that the cable from the handlebars-mounted Motorcycle Mount Enhanced Control Head and to the radio unit is long enough to allow for the handles to be turned.

8 Verify that the antenna cable is routed in the shortest way to minimize power loss over the cable.

9 Check that the mounting surfaces are able to support the weight of the units.

> **NOTICE:** If an additional GPS antenna or a combined TETRA/GPS antenna is used, the antenna housing carries the GPS/GNSS receiver. Take care not to cover the antenna housing with metal or other radio wave absorbing material.

10 Slide the Motorcycle Mount Enhanced Control Head onto the mounting trunnion until it snaps into place.

11 Tighten the screws at both sides of the trunnion. After a few turns, tilt the Motorcycle Mount Enhanced Control Head for an optimum view of the display. Then, complete the tightening of the screws.

12 There are two ways to mount the motorcycle trunnion, each limited to a 77 ° of allowable movement, as shown in the following picture.

Figure 36: Upward Movement
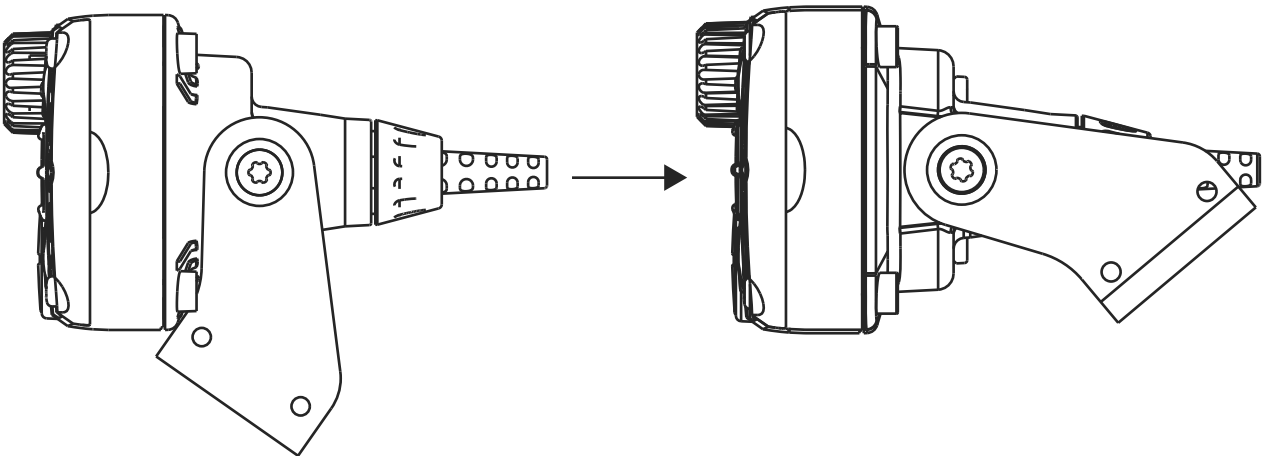
Figure 37: Downward Movement
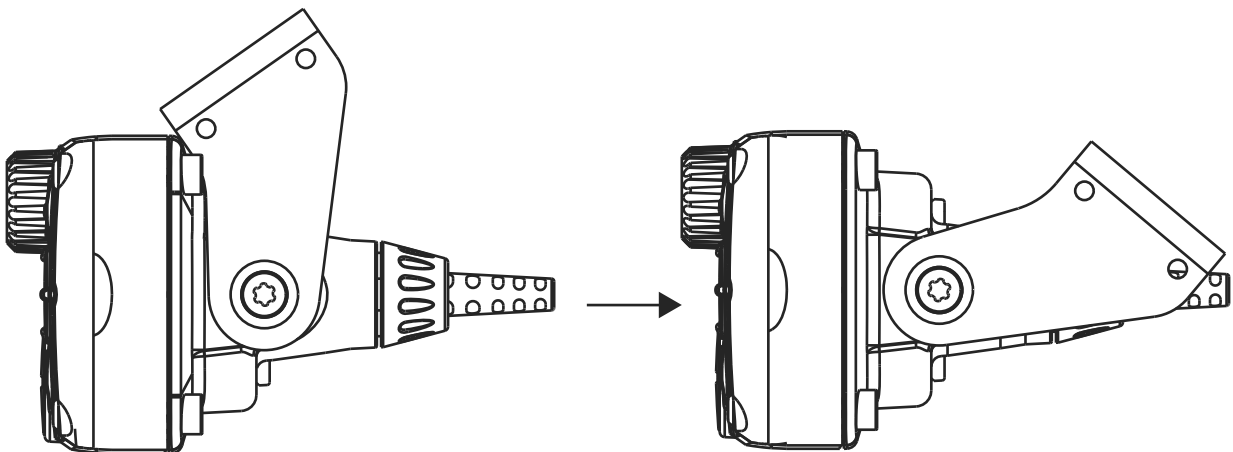
4.5.2
MTM5200/MTM5400 Mechanical Parts

Figure 38: Motorcycle Mount Enhanced Control Head Mounted in a Trunnion

155+/-0.1 mm

33 mm
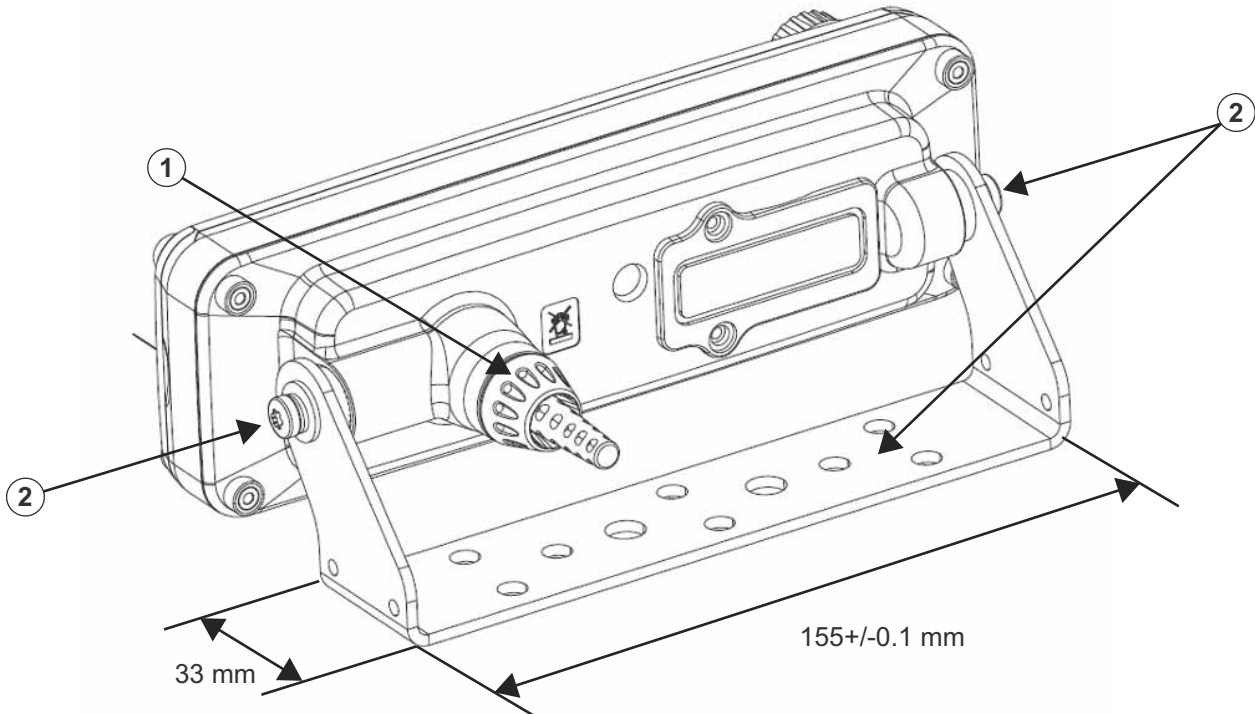
Table 53: Motorcycle Mount Enhanced Control Head - Mechanical Parts List for Installation

Item	Description	Part Number
1	Motorcycle Mount TELCO Cable	PMKN4030_
2	Motorcycle Trunnion Kit	PMLN5092_

4.5.3
Installing Motorcycle Mount TELCO Cable (PMKN4030_)

When and where to use: Follow these steps to install the Motorcycle Mount TELCO Cable (PMKN4030_).

Procedure:

1 Plug the TELCO connector to the TELCO socket of the Remote Head Enhanced/Data Expansion Head Enhanced connected to the transceiver.

2 Plug the other side of TELCO connector to the TELCO socket of Motorcycle Mount Enhanced Control Head.

4.5.4
Adding Extra Connectivity to the Motorcycle Mount Enhanced Control Head

For information on adding extra connectivity using the Accessories Expansion Cable and the Mobile Microphone Port (MMP)/USB Port module, see sections: "Adding Extra Accessories to the Remote Head by Expansion Cable" and "Installing the Accessories Expansion Cable"

4.6
Data Expansion Head Enhanced Installation

4.6.1
Data Expansion Head Enhanced Radio without Control Head

The Data Expansion Head Enhanced can be used without a control head.

This configuration allows the use of the radio without any control head, allowing the radio to be powered on via the ignition switch.

The packet data/SDS via the AT commands are available from the 9-pin subD connector (PEI) and from the Accessory Connector via the USB cable at the same time.

The Remote PTT can be connected via the 26-pin rear connector. Only one talkgroup is available, and that talkgroup is the first one on the CPS list.

4.6.2
Data Box Radio

This configuration allows the controlling of the radio (Transceiver Box) without NGCH via PEI (for example: Personal Computer, Laptop, Console, and so on) with AT Commands (recommended) or TNP1 protocol from a Control Terminal.

In this configuration, the Control Terminal is a substitute for the Enhanced Control Head. The Data Terminal is connected to either the 9-pin socket of the Data Expansion Head Enhanced via the RS232 cable, or to the 26-pin accessory connector via the USB cable.

Figure 39: Data Box Radio Interface Description
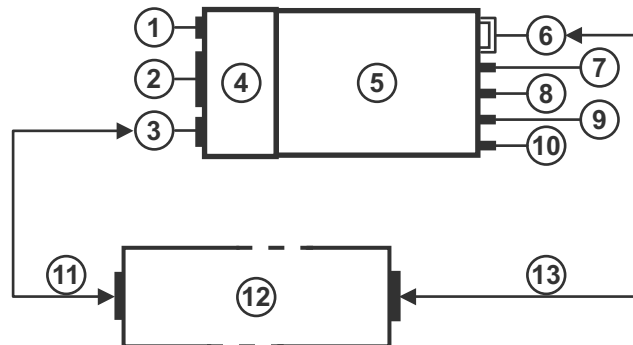
Number	Description
1	TELCO Connector (10–Pin)
2	25–Pin subD Connector (female)
3	9–Pin subD Connector (female)
4	Data Expansion Head Enhanced

Number	Description
5	Terminal Transceiver Box
6	Accessory Connector (26-Pin)
7	SMA GPS Connector
8	Power Connector
9	BNC Antenna Connector
10	BNC RF Connector
11	DB9–DB9 RS232 Cable
12	Data Terminal (can be connected either from the front or the back of the Terminal Transceiver Box)
13	USB Cable

4.6.3
Data Expansion Head Enhanced with Third Party Control Head

In this configuration, radio supports two Control and Data Terminals in parallel. Both support AT Commands for Control and Data. (see *AT Commands Programmer`s Guide*).

The Peripheral Equipment Interface (PEI) is used to transfer data between the Mobile Terminal and External Terminal. The PEI interface is available on both RS232 and USB physical layers depending on the radio configuration. In the dash/desk mount or in the remote mount with no Expansion Head, the radio provides PEI via either 5-wire RS232 or USB at 26-pin Accessory Connector. When Expansion Head is connected the radio supports PEI via both 9-pin SubD (RS232) at Expansion Head and 26-pin Accessory Connector (USB).

The Data Expansion Head Enhanced can be used with a "virtual head" on a PC or a third-party control head.

This configuration allows the controlling of the radio (Transceiver Box) with a Control Terminal (for example: Personal Computer, Laptop, or Console). In this configuration, the Control Terminal is a substitute for the Enhanced Control Head.

Figure 40: Configuration with Two Control and Data Terminals
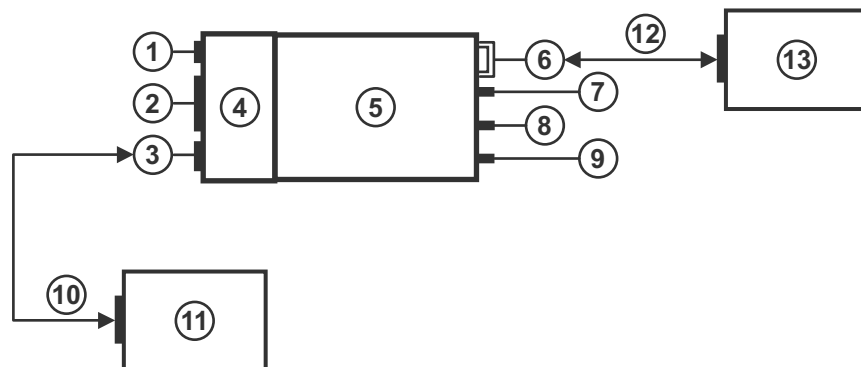
Number	Description
1	TELCO Connector (10-Pin)
2	Connector (female) 25–Pin SubD
3	9-Pin subD Connector (female), 8-Wire RS232 PEI Interface

Number	Description
4	Data Expansion Head Enhanced
5	Terminal Transceiver Box
6	Accessory Connector (26-Pin) / USB 2.0
7	SMA GNSS Connector
8	Power Connector
9	BNC Antenna Connector
10	RS232 PEI Connection
11	Control and Data Terminal via RS232
12	USB 2.0 Cable for PEI and Programming
13	Control and Data Terminal via USB 2.0

4.6.4

Junction Box Installation

The data junction box (GMLN5089_) assists the easy installation for dash and remote mount configurations.

The junction box enables the customer adding a laptop to the remote configuration, connecting a visor microphone, various accessories, or fist microphone.

Figure 41: Remote Mount Installation with Junction Box
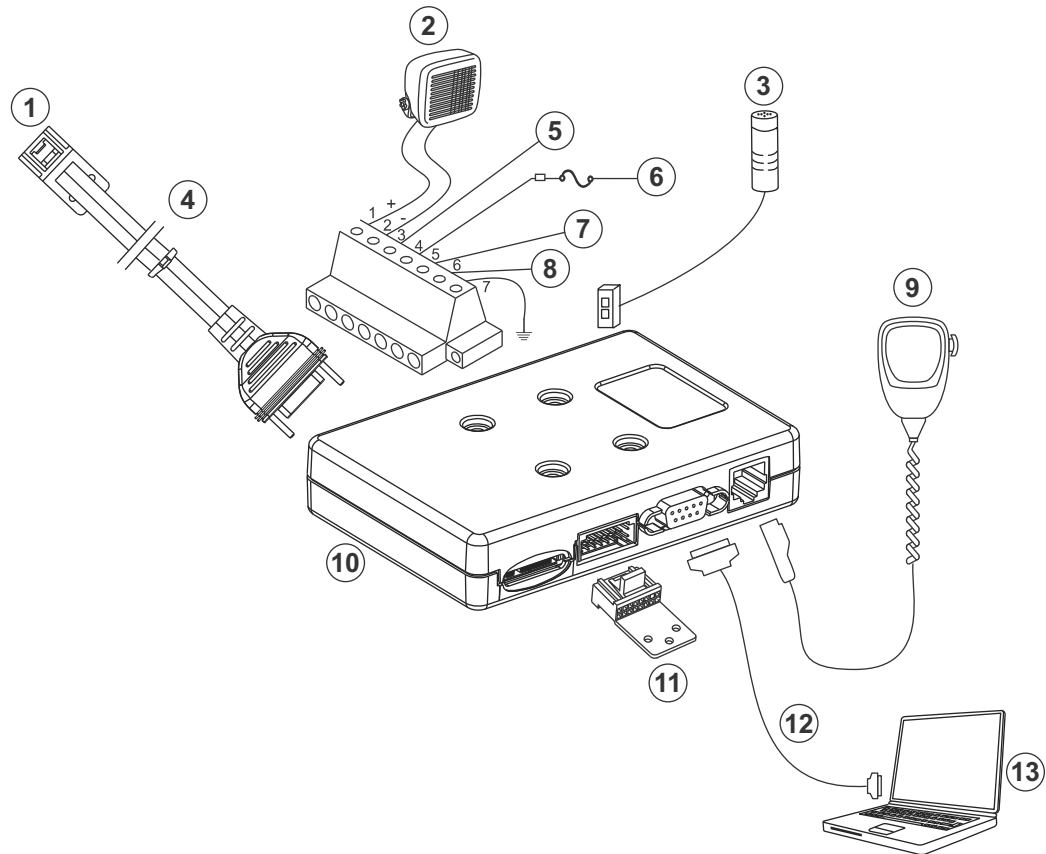
Number	Description
1	To MTM5x00 accessory connector
2	Speaker
3	Visor microphone PMMN4087_
4	Connecting cable PMKN4101/2/3_
5	External PTT
6	To Ignition Switch
7	External Alarm
8	Emergency Switch
9	Fist Microphone GMMN4063_
10	Junction Box GMLN5089_
11	Accessory Connector Kit GMBN1021_
12	Standard RS232 cable

Number	Description
13	Laptop

> **NOTICE:** The junction box PCB is not repairable. Order a new junction box as necessary.

4.6.5
Installing Junction Box

The junction box can be installed horizontally and vertically. The junction box has no connector sealing and is designed for use in dust and water protected location only.

Procedure:

1 Secure the data junction box GMLN5089_ with the four screws supplied with kit.

2 Connect the connection cable PMKN4101_ (length = 6 m), PMKN4102_ (length = 4 m) or PMKN4103_ (length = 2 m) from the junction box to the accessory connector on the rear side of the transceiver and fasten it with the plug-screws.

   The cable used for installation purposes only must be ordered separately. Ingress Protection (IP) Code: IP30

3 All other devices should be adapted as shown in the preceding figure.

4.6.6
Connecting Accessories to the Junction Box

Procedure:

1 Connect all accessories to the junction box. If required see "Re-crimp Procedure" to be able to connect your accessory.

2 Connect the mobile-terminal-to-Junction box cable to the junction box.

3 Connect the programming cable to the junction box (if required).

4.6.7
Connectors on the Junction Box

Figure 42: Connectors on the Junction Box – Front Panel
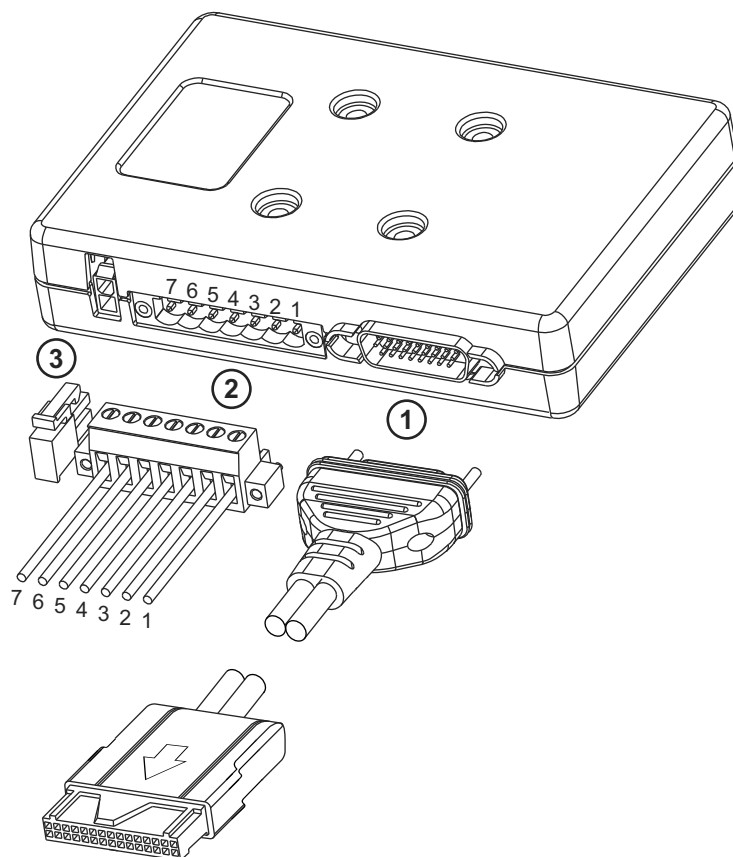
Connectors on the Junction Box - Front Panel

1= Connecting cable from Junction Box to MTM5200/ MTM5400/MTM800 FuG (rear side 26-pin accessory connector) for installation purpose only. PMKN4101_ (length 6 m) PMKN4102_ (length 4 m) PMKN4103_ (length 2 m)	2 = Connector for accessory terminal pin 1 SPEAKER + pin 2 SPEAKER - pin 3 EXT_PTT pin 4 IGNITION SENSE pin 5 EXT_ALARM pin 6 EMERGENCY pin 7	3 = Visor Micro-phone connector PMMN4087_

⚠ **CAUTION:** PIN 4: To short the ignition to ground, use an adapter between the radio and the accessory connector. Interference can cause radio to hang.

Figure 43: Connectors on the Junction Box – Rear Panel
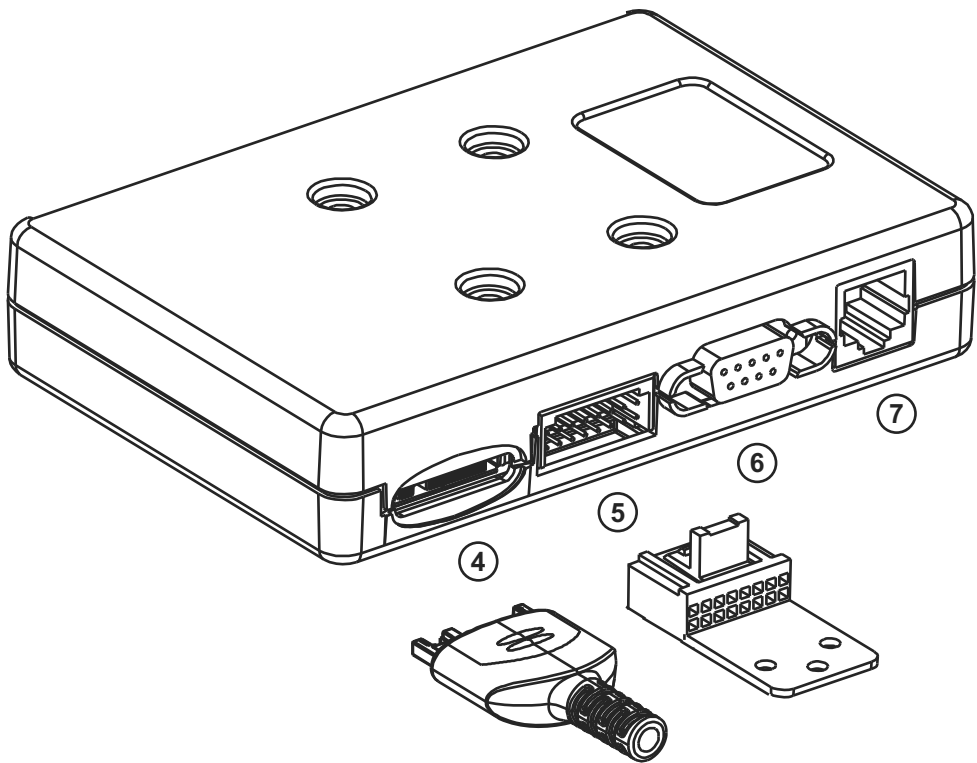
Connectors on the Junction Box - Rear Panel			
4 = Auxiliary PEI port can be used with PMKN4025_.	5 = 16 Pin Connector for Accessories, uses GMBN1021_ or full kit HLN9457_ Accessory connector kit.	6 = Connector for connecting a laptop via RS232 cable	7 = TELCO-connector for fist microphone (GMMN4063_)

4.6.8
Connection Plan for the Junction Box Accessory Terminal

Figure 44: Connection Plan for the Speaker
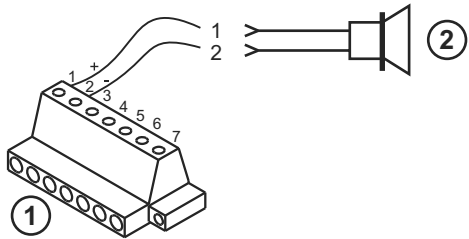
Number	Description
1	Junction Box Terminal
2	Speaker

Figure 45: Connection Plan for the Alarm Relay
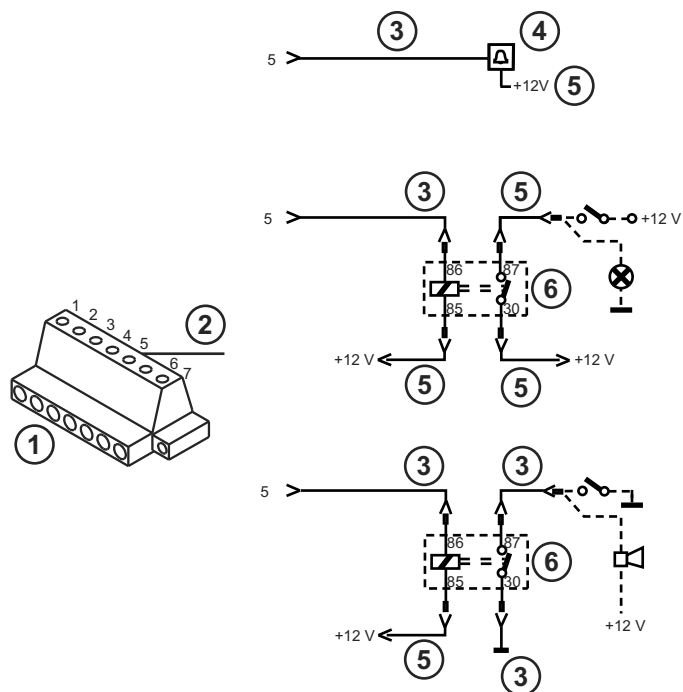
Number	Description
1	JUNCTION BOX TERMINAL
2	EXTERNAL ALARM
3	BLK
4	BUZZLER
5	RED
6	ALARM RELAY

Figure 46: Connection Plan for the Emergency Switch
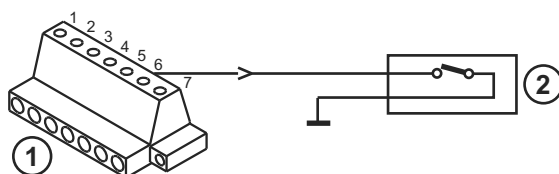
Number	Description
1	Junction Box Terminal
2	Emergency Switch

Figure 47: Connection Plan for the Ignition Sense Cable
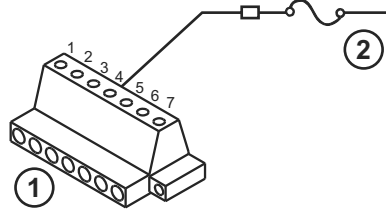
Number	Description
1	Junction Box Terminal
2	To Ignition Switch, Ignition Switch Cable, Switched Battery Voltage

The ignition sense cable PMKN4120 allows the MTM5200/MTM5400 to be turned on and off by the vehicle ignition switch

Figure 48: Connection Plan for External PTT

JUNCTION BOX TERMINAL
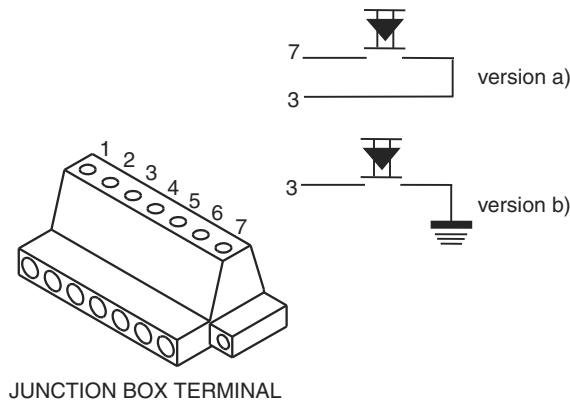
4.6.9
Installing the Cable

Procedure:

1 Connect the stripped lead of the fuse holder cable only to an ignition switched terminal of the fuse block. Use the supplied terminal or any other suitable terminal.

2 Mount the fuse holder using the mounting hole, and dress wires as required.

3 Cut the thin cable to the required length, crimp the supplied red lead to the stripped lead of the thin cable, and connect it to the blue terminal of the fuse holder cable.

4 Connect the other end of the ignition sense thin cable to pin 4 of the junction box terminal.

5 Insert the provided fuse into the fuse holder and close the cover.
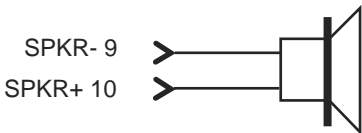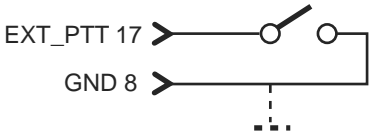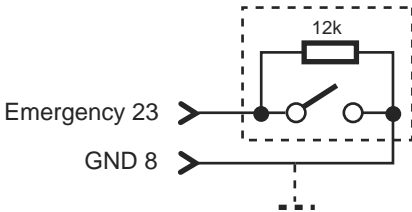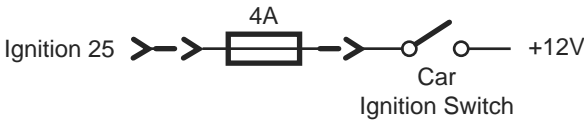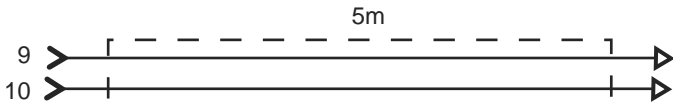
> ⚠ **CAUTION:** PIN 4: Ground the ignition line if it is not used. Interference can cause radio to hang.

4.6.10
Connection Plan for Accessory Connector Kit

Table 54: Accessory Connector Kit – Cable Connectivity

Part Number/Description	Cable Connectivity
GMSN4066_ Speaker 13 W GMSN4078_ Speaker 5 W	SPKR- 9 SPKR+ 10
RLN4857_ Push-button PTT RLN4858_ Gooseneck PTT	EXT_PTT 17 GND 8
RLN4836_ Tri-State Emergency Footswitch and Cable	12k Emergency 23 GND 8
PMKN4120_ Ignition Sense Cable	Ignition 25 4A +12V Car Ignition Switch ⚠ **CAUTION:** HKN9327_ Ignition Sense Cable: Ground the ignition line if it is not used. Interference can cause radio to hang.
GMKN4084_ Speaker Extension Cable	5m 9 10

Part Number/Description	Cable Connectivity
GKN6272_ External Alarm Relay and Cable	

4.6.11
Radios with Data Expansion Head Enhanced

To use a junction box with one of the mobile terminals fitted with a Data Expansion Head Enhanced, always use the 9-pin RS232 port on the Data Expansion Head Enhanced for PEI instead of the 9-pin RS232 port on the junction box (connector 6). Ensure to fit a jumper between pins 6 and 15 of the Junction Box (connector 5) for the PEI to operate correctly in this configuration.

4.6.12
Standard Radios without Data Expansion Head Enhanced

For standard mobile terminals without a Data Expansion Head Enhanced, the jumper between pins 6 and 15 of the junction box (connector 5) should be removed.

Mobile Terminal	Fit Jumper Pins 6-15?	Use Junction Box RS232 PEI?
With Data Expansion Head Enhanced	Yes	No. Use the Data Expansion Head Enhanced 9-pin PEI instead.
Without Data Expansion Head Enhanced	No	Yes

4.6.13
Standard Radios without Ethernet Data Expansion Head

For standard mobile terminals without an Ethernet Data Expansion Head, the jumper between pins 6 and 15 of the junction box (connector 5) should be removed.

Mobile Terminal	Fit Jumper Pins 6-15?	Use Junction Box RS232 PEI?
With Ethernet Data Expansion Head	Yes	No. Use the Ethernet Data Expansion Head 9-pin PEI instead.
Without Ethernet Data Expansion Head	No	Yes

4.7
Installing Trunnion

When and where to use: The trunnion allows the terminal to be mounted to various surfaces. The trunnion must be securely fixed to the vehicle chassis.

Procedure:

1 Ensure that the surface can support the weight of the terminal.

Although the trunnion can be mounted to a plastic dashboard, it is recommended that the mounting screws be located so they penetrate the supporting metal frame of the dashboard.

2 Ground the radio housing to the nearest vehicle chassis ground point, which can be done by removing the paint from the trunnion where the radio and vehicle chassis touches the trunnion, or use a short cable with ring lugs in both end and connect this to chassis under the wing screw.

Figure 49: Terminal into High Profile Trunnion (GLN7317_)
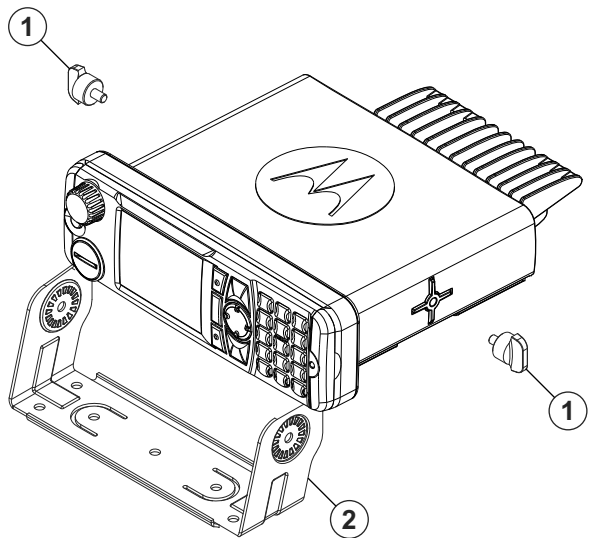
Number	Description
1	Wing screws (0302637Y01), wing screws are included in Trunnion Mount Kit.
2	Trunnion — main part, Part Number. GLN7317_

Figure 50: Terminal into Key Locked Mount Trunnion (RLN4779_)
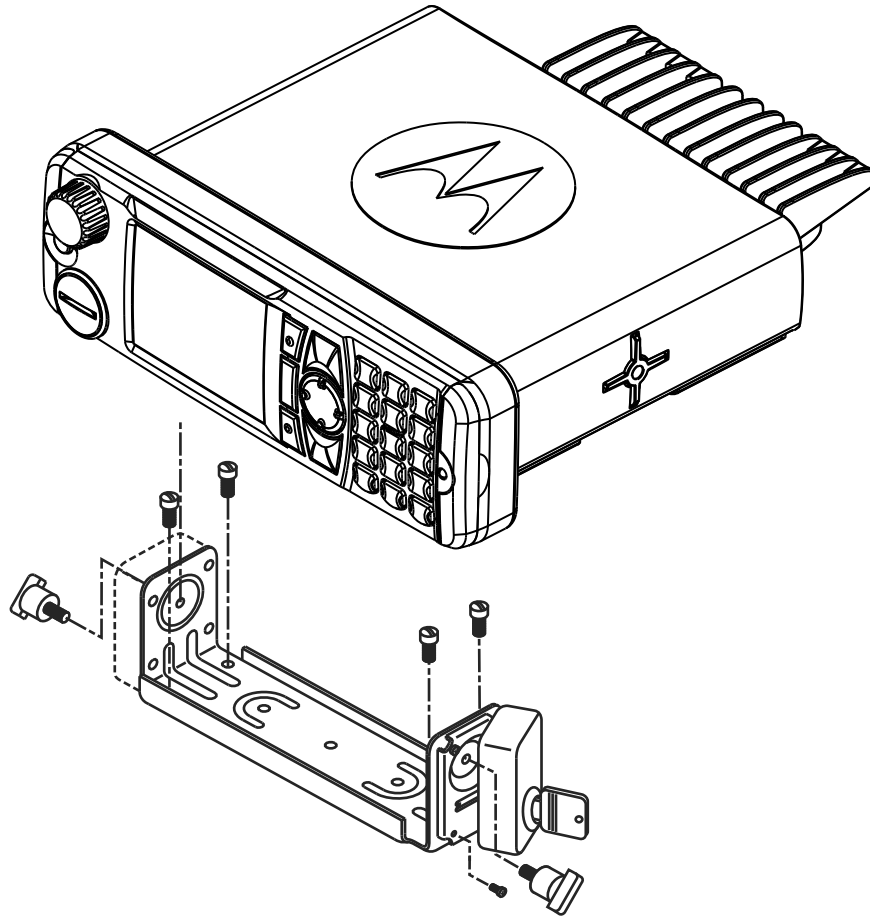
3 Select either the transmission hump or an open underneath portion of the dash to mount your terminal (see the following figure). When mounting the trunnion on the transmission hump, be careful that the transmission housing is not affected.

4 To mark the hole positions on the mounting surface, use the trunnion mounting bracket as a template. Use the innermost three holes for a curved mounting surface, such as the transmission hump, and the three outermost holes for a flat surface such as under the dash.

5 Centre-punch the spots you marked and use a 4 mm (5/32-inch) bit to drill a hole at each location.

6 Secure the trunnion mounting bracket to the mounting surface with the three self-tapping screws provided (see the following figure).

7 Slide the terminal into the trunnion. Secure the terminal with the two wing screws provided.

> **NOTICE:** The keypad labeling of the control head may vary according to the specific customer/country concerns.

8 Ground the radio housing to the nearest vehicle chassis ground point, which can be done by removing the paint from the trunnion where the radio and vehicle chassis touches the trunnion, or use a short cable with ring lugs in both end and connect this to chassis under the wing screw.

Figure 51: Top of Dash Mount
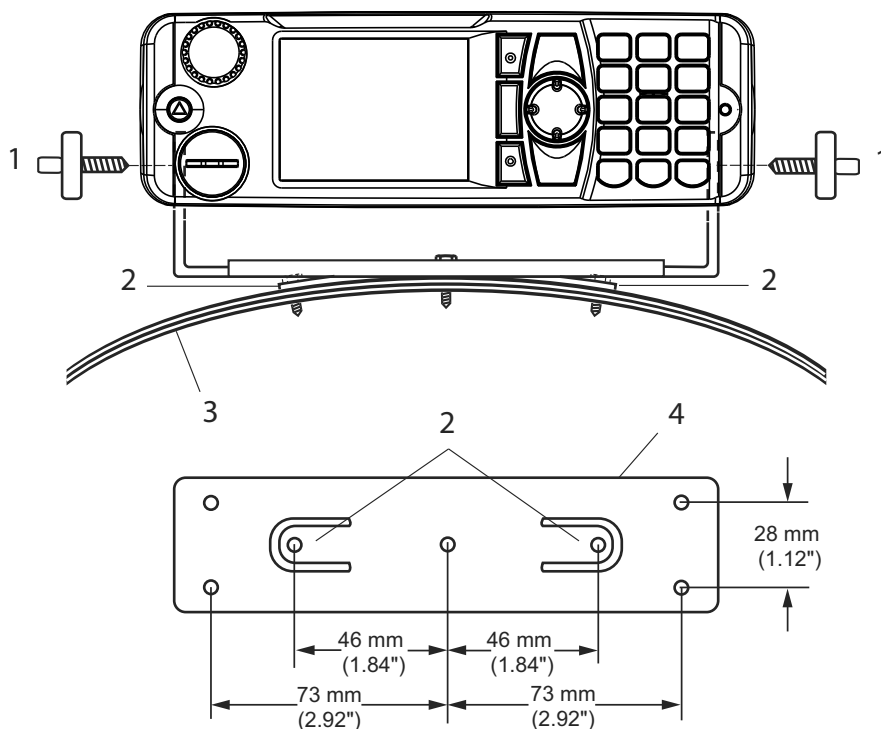
Number	Description
1	Wing screw
2	Tab
3	Mounting surface
4	Trunnion mounting bracket

The GLN7317_ kit comes complete with:

- 0771061L01 – Bracket, Standard Trunnion
- 0302637Y01 – Wing Screw M5x7.9 mm, quantity 2
- 0400002647 – Lock washer, quantity 2
- 0312002B14 – Self-drill Steel 10-16x1, quantity 4

Figure 52: Below Dash Mounting
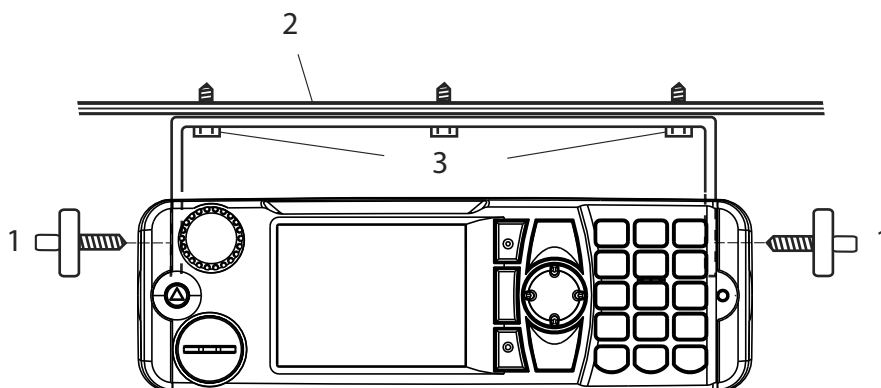
Number	Description
1	Wing screw
2	Mounting surface
3	Sheet metal screws

Connectors and PIN Assignment

5.1
Transceiver Rear Side

Figure 53: Location of Accessory Connector – Rear Side
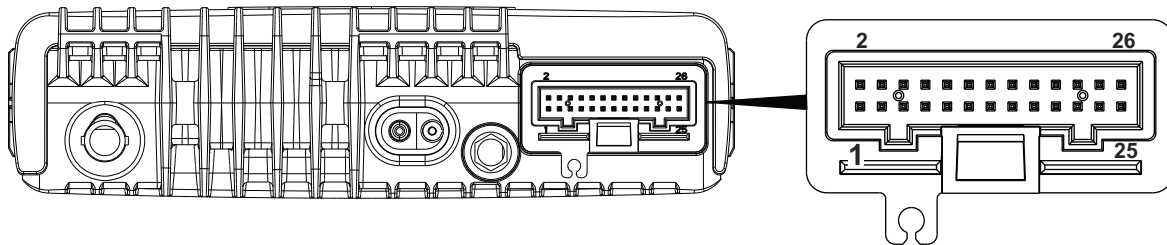
> ⚠️ **CAUTION:** The accessory connections shown are not compatible to some other models of Motorola Solutions radios. Check the appropriate accessory or technical manual for further information.

Table 55: 26-Pin Accessory Connector

Pin	Function	Description
1	UART1_TXD / USBx_D+	USB1.1 – Default Host
2	UART1_RXD / USBx_D-	RS232 or UART2 – Alternative Setting
3	UART1_RTS / USBx_VBUS	📝 **NOTICE:**
4	GND_USBx	When Expansion Head is connected, the connection is USB1.1. UART2 is configured on the DB9 interface on the expansion Head. The radio monitors DB9 interface to detect cable connection/ disconnection based on the pin voltage level of RX and DTR lines.
5	1-WIRE	1-Wire standard port (pulled through 2K2 to 5 V inside U600), Data for RMN5054_ Microphone
6	KEYFAIL / FLASH	Key load (pulled through 10 K to 5 V) Flash input (>10 V triggers Flash mode)
7	SWB +	A+ voltage (limited to 14 V) with 1 A current limitation
8	GND_MAIN	Main and power ground
9	SPEAKER-	Loudspeaker (PA) output – ⚠️ **WARNING:** Do not ground! See Table 2Table 77: Normal Load Conditions on page 126 for Rated Audio Power. Do not attach audio accessories single-ended between the

Pin	Function	Description	
10	SPEAKER+	Loudspeaker (PA) output +	speaker out (+ or -) and ground on the rear connector because the mobile radio has a Class D amplifier. If it is required to connect a single ended accessory to the speaker out, then convert the balanced speaker output from the radio to single-ended using a transformer or an electrical circuit.
11	TX_AUDIO	TX audio input (Line In, 26-pin rear connector J400, used for audio recording)	
12	GND_ANA	Main audio ground	
13	MIC1 / EXT_MIC	External microphone input (EXT_MIC) or first microphone (MIC1) for noise canceling dual microphone input Nominal sensitivity: 80 mV RMS, Bias voltage: 9.3 V or 2.1 V (Selected accessory dependent)	
14	RX_AUDIO	RX audio output (Line Out, 26-pin rear connector J400, used for audio playback) 📝 NOTICE: Voice recorder feature is only applicable for software release MR15.1 and above.	
15	MIC2	Microphone input (MIC2) Nominal sensitivity: 80 mVrms, Bias voltage: 9.3 V or 2.1 V (selected accessory dependent)	
16	GND_MIC	Ground (for MIC)	
17	EXTERNAL_PTT	PTT input (pulled through 4K7 to 5 V)	
18	UART2_DTR / USBy_ID	RS232 or UART1/ UART2 DTR/2nd USB2.0 (OTG) ID	• When Expansion Head is connected, the connection is USB2.0.
19	HOOK_PA_EN	HOOK_PA_EN input	• When Expansion Head is not connected and UART2 is configured on pins 1–4 in CPS codeplug, the connection is USB2.0.
20	UART2_TXD / USBy_TX	RS232 or UART2 TXD/2nd USB2.0 (OTG) D+	
21	UART2_RTS / USBy_VBUS	RS232 or UART2 RTS/2nd USB2.0 (OTG) VBUS – 100 mA	• If UART2 is not configured on pins 1–4 in CPS codeplug, USB2.0/UART2 is automatically switched depending on which accessory is detected.
22	UART2_RXD / USBy_RX	RS232 or UART2 RXD/2nd USB2.0 (OTG) D-	

Pin	Function	Description
23	EMERGENCY	Emergency Input (Pulled through 24K9 to A+) – Pull low to power on
24	UART_CTS	RS232 or UART1 / UART2 CTS input
25	IGNITION	Ignition input (through series 15K) – Pull > 10 V to power on
26	EXTERNAL ALARM	External Alarm output (Pulled through 4K7 to A +) External Alarm works only when the ignition is off.

⚠ **CAUTION:** Pin 25: If the ignition line is not used, it must be grounded for example connected to pin 8. Interference can cause radio to hang.

🖉 **NOTICE:** Pins 13 and 15 cannot be used (nor configured) at the same time.

5.2

Accessory Connection Plan

⚠ **CAUTION:** The accessory connections shown are not compatible to some other models of Motorola Solutions radios. Check the appropriate accessory or technical manual for further information. Ensure correct position of the accessory connector.

Figure 54: Accessory Connector
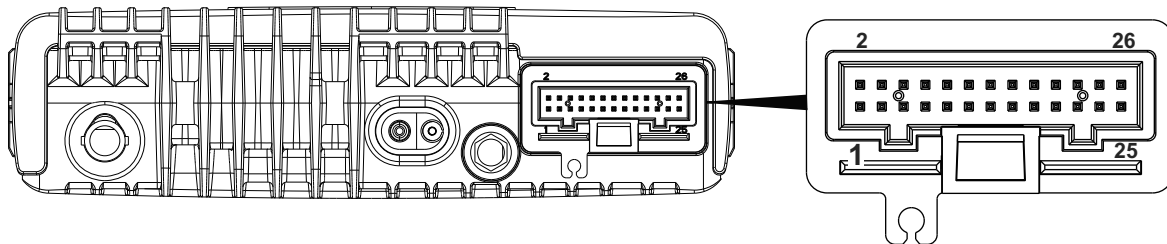
Figure 55: 26–Pin Accessory Connector
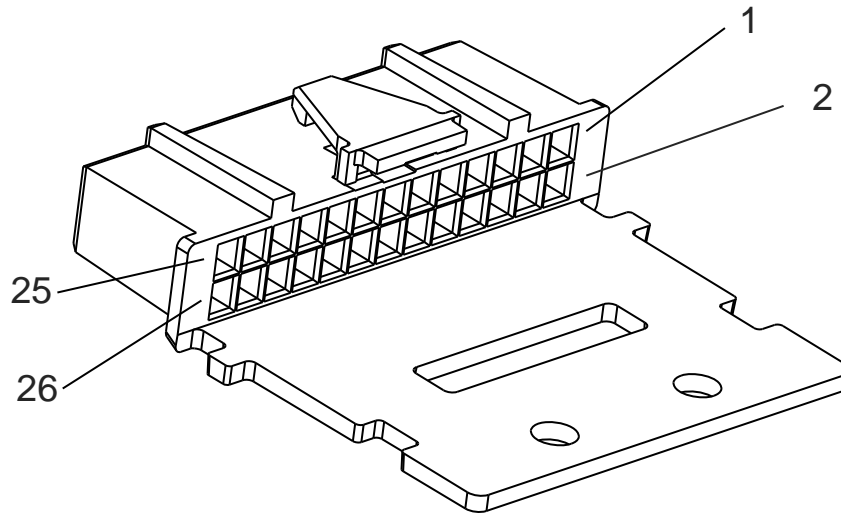
The 26-pin connector, Part Number: 1516174H01 (delivered with the accessory connector kit, Part Number: PMLN5072_) plugs into the 26-pin accessory connector on the terminal.

Figure 56: Connecting Diagrams

RSN4002	Speaker 13 W
RSN4004	Speaker 5 W
RLN4857	Pushbutton w/Remote PTT
RLN4858	Gooseneck PTT
RLN4836	Tri-state Emergency Footswitch and Cable
PMKN4119	Speaker Extension Cable
HKN9327	Ignition Sense Cable w/ fuse
PMMN4087	Visor Microphone w/ cable
GMMN4065	
RMN5054	

PMLN5072 Accessory connector kit containing:
1516174H01   Accessory Connector 26-pin
3915560H01   Crimp Contact 20-24 AWG (quantity 27)
4210217A02   Nylon Tie Rap
6671929L01   Service Tool

The recommended crimp tool (not part of PMLN5072):
SamTec P/N: CAT-HT-179-2024-11910910

GMLN5091 External Alarm Relay Kit containing:
GKN6272   External Alarm Relay and Cable
PMLN5072   Accessory Connector Kit

⚠ **CAUTION:** HKN9327_ Ignition Sense Cable: If the ignition line is not used, it needs to be grounded. Interference can cause radio to hang.

5.3
Re-crimp Procedure

To use accessories from MTM800 such as RLN4858_ and GKN6272_ with the rear connector of the radio, follow the re-crimp procedure using the crimp pins provided with PMLN5072_ connector kit. These accessories do not require to be re-crimped when used with the Data Junction Box GMLN5089_.

Process:

1   Cut and remove nickel plated pins from wire.

2   Strip the insulation from the end of the wires (2 mm to 4 mm).

3   Place the new gold plated crimp pin (from the PMLN5072_ kit) on the gauge slot on the crimp tool.

4   Insert wire into the wire slot of the crimp pin.

5   Apply pressure to the crimp tool handle, until wire is crimped by the pin.

5.4
Connectors and Pin Assignment of Data Expansion Head Enhanced and Remote Head Enhanced

Figure 57: Data Expansion Head Enhanced – Front View and Connector Location
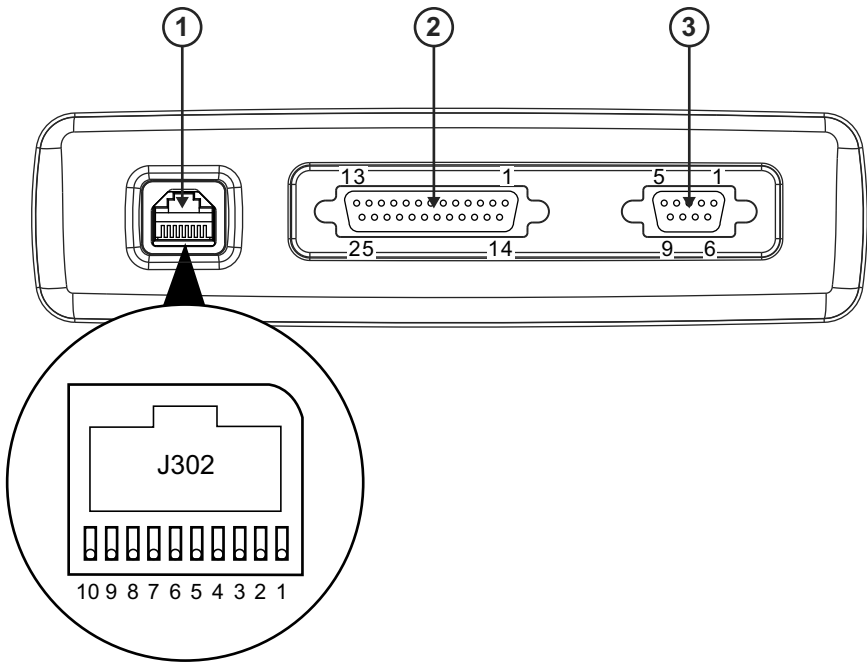
Number	Description
1	10-Pin TELCO Connector, Front View, ⚠ **CAUTION:** Connector to the Control Head, NOT a microphone connector.
2	25-Pin subD Connector
3	9–Pin subD Connector

Figure 58: Remote Head Enhanced – Front View and Connector Location
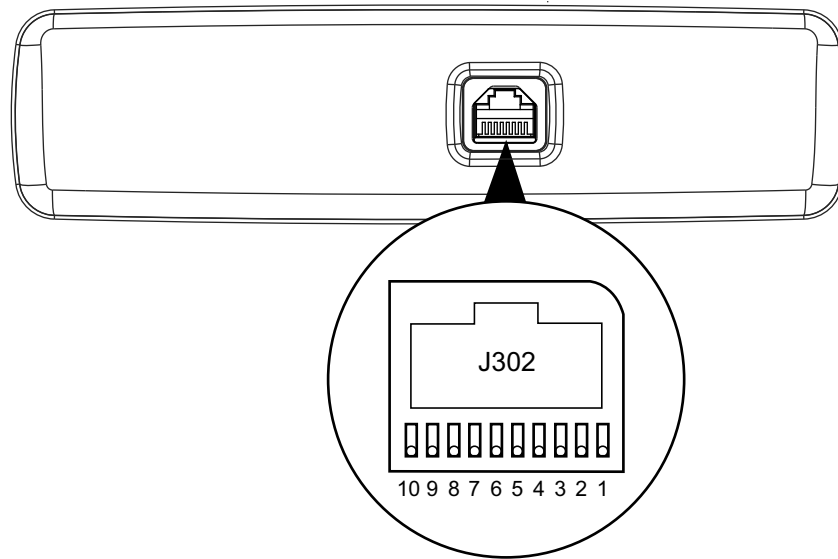
> ⚠ **CAUTION:** Connector to the Control Head.

5.4.1
10-Pin TELCO Connector

Data Expansion Head Enhanced:

1 The 10-pin TELCO connector can be used to connect a customized adapter, for example, for connecting the helmet including microphone/earpiece (non-Motorola Solutions accessory) or an external PTT. The customized adapter is connected using the cable RKN4077_.

2 The 10-pin TELCO connector can be used to connect a remote mount Enhanced Control Head.

> ⚠ **CAUTION:** DO NOT connect any other accessories (for example, microphone). This might result in malfunctioning hardware failure.

Remote Head Enhanced:

The 10-pin TELCO connector of the Remote Head Enhanced can be used in the same way as described in point 2.

Table 56: 10–Pin TELCO Connector Pins

PIN	Function	Description
1	Audio +	Balanced Audio + (Bidirectional)
2	Not Connected	NC
3	BUS+	This is used for communication between the radio and an Enhanced Control Head.
4	Audio-	Balanced Audio - (Bidirectional)
5	Not Connected	NC
6	Ground	Ground
7	Radio On/Off Control	This is the Enhanced Control Head service request input. A level of 5 V indicates that the Enhanced Control Head needs to com-

PIN	Function	Description
		municate with the radio. In addition, it switches on the voltage regulators of the radio. The idle state is a level below 0.6 V.
8	SCI_TX	This if for communication between the radio and the Enhanced Control Head.
9	FLT_A+	This voltage is at battery voltage level and is available as long as the radio is connected to the supply voltage. The maximum current is 300 mA. A fuse in the radio prevents further circuit damage in case of shorting this pin to ground.
10	Analog Ground	Analog Ground

5.4.2

25-Pin subD Connector

Data Expansion Head Enhanced:

Turn the radio ON/OFF using the Ignition Sense Cable PMKN4120_. Connect the PMKN4120_ cable to Pin 10 on the rear side Accessory Connector.

Table 57: 25–Pin subD Connector Pins

PIN	Function	Description
1	GND	Ground
2	RS232_SCI_TX	Transceive data (RS232 line with RS232 level)
3	RS232_SCI_RX	Receive data (RS232 line with RS232 level)
4	RS232_RTS	Request to Send (RS232 line with RS232 level)
5	RS232_CTS	Clear to Send (RS232 line with RS232 level)
6	FLT_A+	Filtered unswitched UB+/200 mA
7	Signal_GND	Ground for RS232
8	Not Connected	NC
9	Not Connected	NC
10	Not Connected	NC
11	Not Connected	NC
12	SW_B+	Switched UB+/100 mA
13	Not Connected	NC
14	ON_OFF_CONTROL / FLASH_MODE	• Switch into flash mode (connect Pin 14 with 6) • On/Off control for Standard Control Head
15	Not Connected	NC
16	INT_MIC	Microphone analogue input of 80 mV RMS, 600 Ω impedance, 9 V
17	Not Connected	NC
18	Not Connected	NC
19	GROUND	Ground

PIN	Function	Description
20	IGNITION	Connecting this pin to the ignition line of the vehicle will automatically turn on the radio if ignition of the vehicle is turned on.
21	ON_OFF_GND	This is the On/Off control for the old Control Head "J" (MTM300 Control Head)
22	EXPANSION_PTT	Expansion PTT, works together with INT_MIC
23	Not Connected	NC
24	HANDSET_AUDIO	Handset audio to earpiece impedance has to be > 200 Ω
25	Not Connected	NC

5.4.3
9-Pin subD Connector

The pin assignment of this 9-pin subD connector follows the requirements of an RS232 standard interface with the RS232 voltage level. The cable (see section "Connecting Cables") which has to be used is a standardized serial interface cable which allows to connect a data device with an RS232 Interface such as PC, Laptop, Console.

Table 58: 9–Pin subD Connector Pins

Pin	Function	Description	PC Direction
1	DCD	Data Carrier Detect	Input
2	RXD	Received Data Serial	Serial IN
3	TXD	Transmitted Data	Serial OUT
4	DTR	Data Terminal Ready	Output
5	GND	Ground Output	Output
6	DSR	Data Set Ready	Input
7	RTS	Request to Send	Output
8	CTS	Clear to Send	Input
9	RI	Ring Indicator	Input

5.5
Connectors and Pin Assignment of Ethernet Expansion Head

Figure 59: Ethernet Expansion Head Enhanced – Front View and Connector Location

Number	Description
1	Two 10–Pin Ethernet Connectors. (Connectors to the Control Heads or Ethernet Expansion Head).
	⚠ **WARNING:** Ethernet Expansion Heads are only compatible with Ethernet Remote Heads. Do not mix Ethernet control head with non-Ethernet control heads.
2	10–Pin Connector
3	9–Pin subD Connector

> 🖊 **NOTICE:** Use appropriate 10-Pin Ethernet cable to connect Control Heads or Ethernet Expansion Head. Do not use TELCO cables.

5.5.1
Ethernet Control Head Interfaces

Table 59: Pin Assignment of the 10-Pin RJ50 Port 1 and Port 2 Connector – Ethernet Expansion Head

Pin	Function	Description
1	FLT_A+ (12 V)	This is the voltage supply for EEH from power supply or battery
2	TX_P_P1	Ethernet transmit positive line, TX+
3	TX_N_P1	Ethernet transmit negative line, TX-
4	RX_P_P1	Ethernet receive positive line, RX+
5	GND	Main board GND
6	GND	Main boards GND
7	RX_N_P1	Ethernet receive negative line, RX-
8	CH_ON_OFF_OUTX_5 V	ON/OFF control line Transceiver to Control Head
9	CH_ON_OFF_INX_5 V	ON/OFF control line from Control Head to Transceiver

Pin	Function	Description	
10	FLT_A+ (12 V)	This is the voltage supply for EEH from power supply or battery	

5.5.2
9-Pin subD Connector

The pin assignment of this 9-pin subD connector follows the requirements of an RS232 standard interface with the RS232 voltage level. The cable (see section "Connecting Cables") which has to be used is a standardized serial interface cable which allows to connect a data device with an RS232 Interface such as PC, Laptop, Console.

Table 60: 9–Pin subD Connector Pins

Pin	Function	Description	PC Direction
1	DCD	Data Carrier Detect	Input
2	RXD	Received Data Serial	Serial IN
3	TXD	Transmitted Data	Serial OUT
4	DTR	Data Terminal Ready	Output
5	GND	Ground Output	Output
6	DSR	Data Set Ready	Input
7	RTS	Request to Send	Output
8	CTS	Clear to Send	Input
9	RI	Ring Indicator	Input

5.6
Connector and Pin Assignment of the Enhanced Control Head

Figure 60: Mobile Microphone Port Connector of the Enhanced Control Head
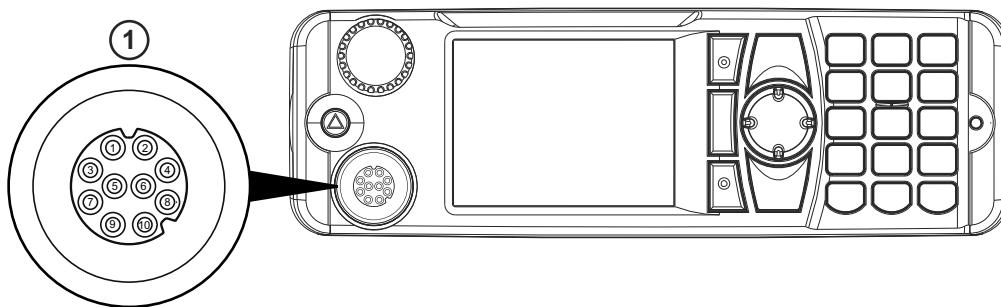
Number	Description
1	View of the Mobile Microphone Port Connector of the Enhanced Control Head

NOTICE: The keypad labeling of the control head may vary according to the specific customer/country concerns.

Table 61: Mobile Microphone Port Connector of the Enhanced Control Head

Mobile Micro-phone Port Pin	Default Functions	Alternative Functions	USB Functions	RS232 Func-tions
📝	**NOTICE:** The connector enters one of the 5 modes automatically based on the automatic detection of the connected accessory.			
1	1-WIRE	1-WIRE	1-WIRE	1-WIRE	1-WIRE
2	GPIO_3	PTT	GP Input or Output	GP Input or Output	RS-232-RTS
3	SPEAKER	SPEAKER	SPEAKER	SPEAKER	SPEAKER
4	GPIO_2	GPIO_2 INPUT	GP Input or Output	DATA -	RS-232-RXD
5	GND	GND	GND	GND	GND
6	OPT 5V	HIGH Impedance	OPT 5V	VBUS	OPT 5V
7	MIC +	MIC +	MIC +	MIC +	MIC +
8	GPIO_1	GPIO_1 INPUT	GP Input or Output	DATA +	RS-232-TXD
9	GPIO_4	HOOK	GP Input or Output	GP Input or Output	RS-232-CTS
10	GPIO_0	GPIO_0 INPUT	GP Input or Output, PWR ON	GP Input or Output, PWR ON	GP Input or Output, PWR ON

Figure 61: Enhanced Motorcycle Control Head –Rear View
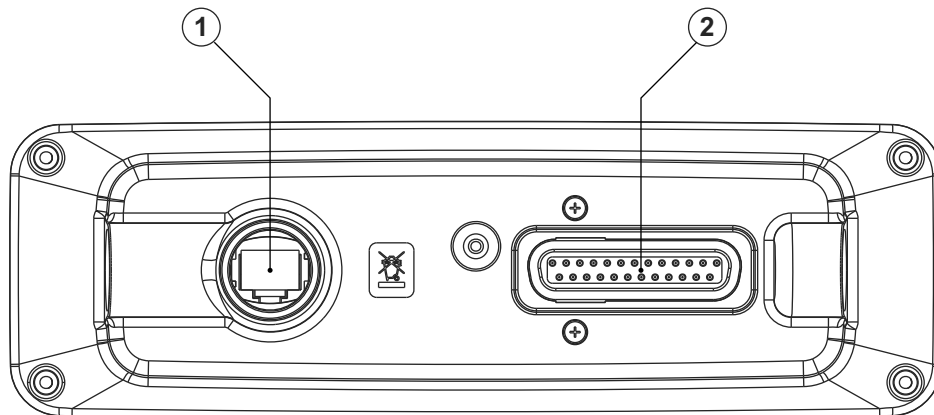
Figure 62: Remote Enhanced Control Head – Rear View
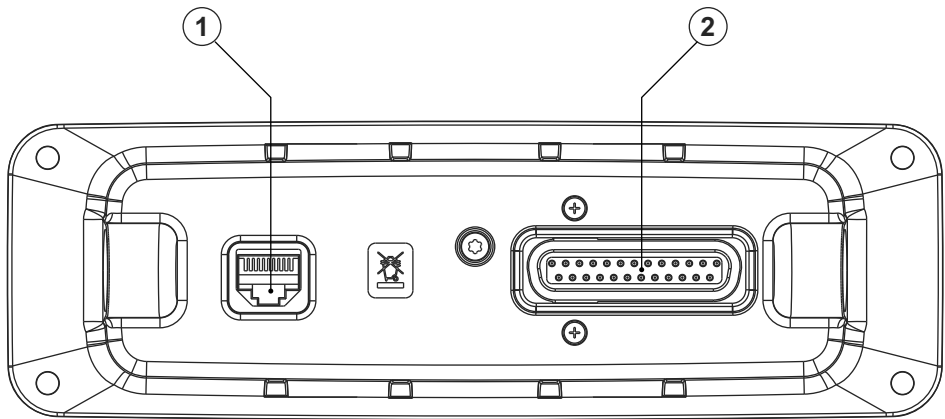
Figure 63: Enhanced Motorcycle Control Head – Rear Connectors
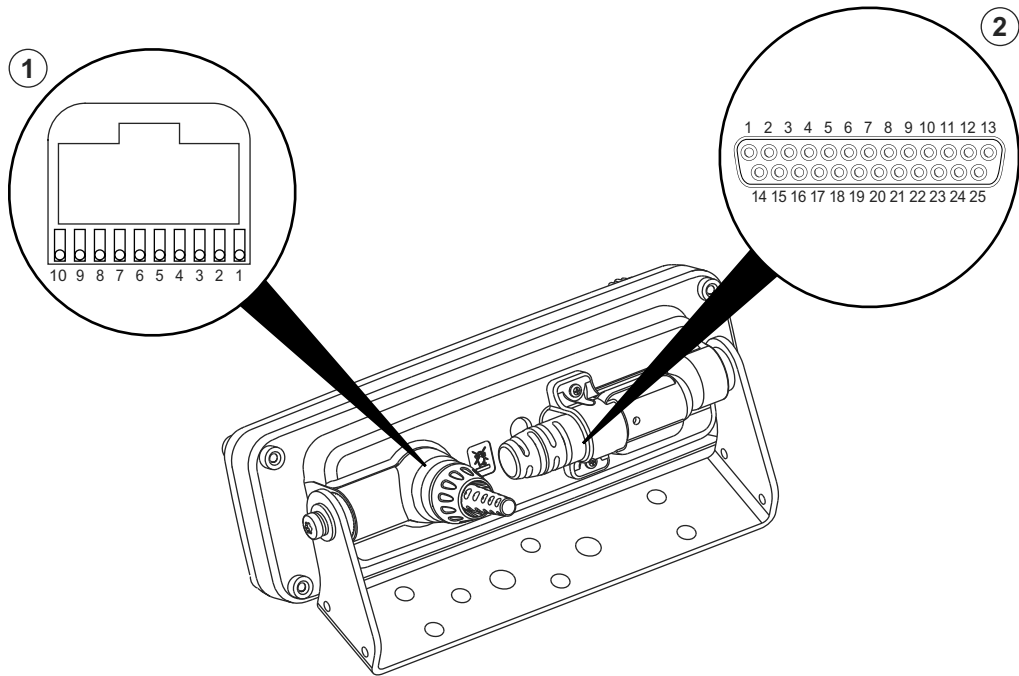
> **NOTICE:** Connectors on the Motorcycle Enhanced Control Head, and Remote Enhanced Control Head are the same. The housings and the cables are different.

Number	Description
1	10-Pin Telco Connector
2	25-Pin Back Connector

Table 62: 10-Pin Telco Connector

Pin	Function	Description
1	AUDIO +	Balanced Audio + (Bidirectional)
2	NC	Not Connected

Pin	Function	Description
3	BUS +	This is used for communication between the radio and an Enhanced Control Head.
4	AUDIO -	Balanced Audio - (Bidirectional)
5	NC	Not Connected
6	GND	Ground
7	Radio On/Off Control	This is the Enhanced Control Head service request input. A level of 5 V indicates that the Enhanced Control Head needs to communicate with the radio. In addition, it switches on the voltage regulators of the radio. The idle state is a level below 0.6 V.
8	SCI_TX	This if for communication between the radio and the Enhanced Control Head.
9	FLT_A +	This voltage is at battery voltage level and is available as long as the radio is connected to the supply voltage. The maximum current is 300 mA. A fuse in the radio prevents further circuit damage in case of shorting this pin to ground.
10	Analog Ground	Analog Ground

Table 63: 25-Pin Back Connector

Pin	Function	Description	Default
1	GPIO_9	NGCH GPIO4	Output: Active for duration of call (car radio mute). Can be used as a trigger to a local logger device.
2	GPIO_6	External PTT for MIC_REAR_2	PTT Input, TX audio from MIC_REAR_2
3	GPIO_8	NGCH GPIO2 (CPS configurable)	Disabled
4	GPIO_3	GCAI PIN 2 Mobile Microphone Port, External PTT or MIC_REAR_1, Ground Pin 8 to activate MIC_REAR_1	PTT Input, TX audio from MIC_REAR_1
5	VBUS_1B	GCAI PIN 6: 5 V Supply	Disabled
6	REAR_D -	GCAI PIN 4: USB D -, GPIO_2 (Shared with the front MMP)	Disabled
7	REAR_D +	GCAI PIN 8: USB D +, GPIO_1 (Shared with the front MMP)	Disabled
8	GPIO_0	GCAI PIN 10: GPIO	Input: GCAI detection / Select Line
9	VBUS_2	Second USB 5 V Supply	Disabled
10	TX	4-wire RS232 TX	
11	RX	4-wire RS232 RX	
12	MIC_REAR_2	Second Microphone Input (MIC_REAR_2), Nominal sensitivity 80 mV RMS, Bias voltage 9.3 V	Disabled

Pin	Function	Description	Default
13	GND	Ground	
14	GPIO_5	NGCH GPIO1 (CPS configurable)	Disabled
15	GPI_7	4-Level Analog Input	Enabled
16	1_WIRE	GCAI PIN 1: Bi-directional Serial Bus	Disabled
17	HANDSET	GCAI PIN 3: Handset Audio Output	Parallel to front GCAI
18	GND	GCAI PIN 5: Ground	
19	MIC_REAR_1	External Microphone Input (MIC_REAR_1), Connected to GCAI PIN 7, Nominal sensitivity 80 mV RMS Bias voltage 9.3 V (Ground PIN 8 to activate)	Disabled
20	GPIO_4	GCAI PIN 9: GPIO	Hook Input
21	USB_D +	Second USB D +	
22	USB_D -	Second USB D -	
23	RTS	4-wire RS232 RTS	
24	CTS	4-wire RS232 CTS	
25	PWR_ON	Enhanced Control Head Power On Input	

5.7
Connector and Pin Assignment of Ethernet Control Head (eCH)

**Figure 64: View of the Ethernet Control Head (eCH) with Mobile Microphone Port Connector**
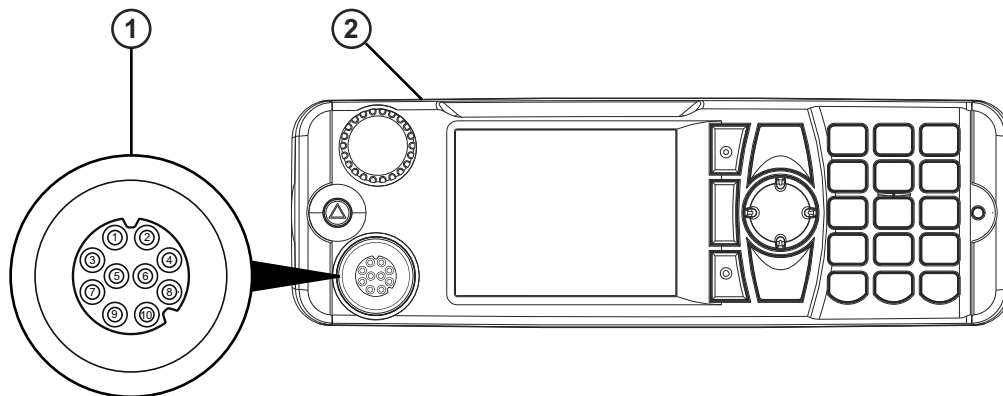
Number	Description
1	View of the Ethernet Control Head's Mobile Microphone Port Connector
2	Ethernet Control Head

Table 64: Mobile Microphone Port Connector

Mobile Micro-phone Port Pin	Default Functions	Alternative Functions	USB Functions	RS232 Func-tions
✎ NOTICE: The connector enters one of the 5 modes automatically based on the automatic detection of the connected accessory.				
1	1-WIRE	1-WIRE	1-WIRE	1-WIRE	1-WIRE
2	GPIO_3	PTT	GP Input or Output	GP Input or Output	RS-232-RTS
3	SPEAKER	SPEAKER	SPEAKER	SPEAKER	SPEAKER
4	GPIO_2	GPIO_2 INPUT	GP Input or Output	DATA -	RS-232-RXD
5	GND	GND	GND	GND	GND
6	OPT 5V	HIGH Impedance	OPT 5V	VBUS	OPT 5V
7	MIC +	MIC +	MIC +	MIC +	MIC +
8	GPIO_1	GPIO_1 INPUT	GP Input or Output	DATA +	RS-232-TXD
9	GPIO_4	HOOK	GP Input or Output	GP Input or Output	RS-232-CTS
10	GPIO_0	GPIO_0 INPUT	GP Input or Output, PWR ON	GP Input or Output, PWR ON	GP Input or Output, PWR ON

Figure 65: Ethernet Control Head – Rear Connectors
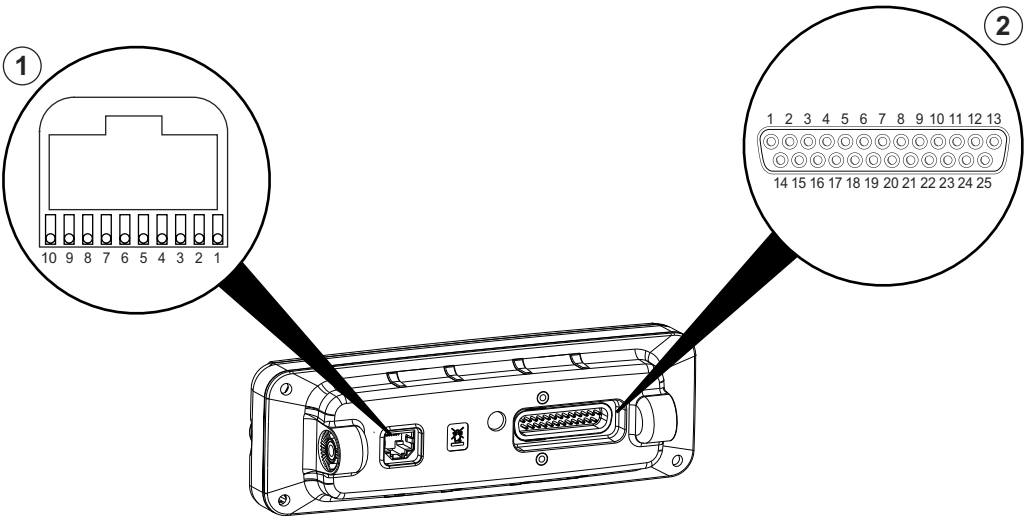
Number	Description
1	10-Pin Ethernet Connector
2	25-Pin Back Connector

Table 65: 10-Pin Ethernet Connector

Pin	Function	Description
1	FLT_A+ (12 V)	This is the voltage supply for the Control Head from power supply or battery
2	TX+ Ethernet	Ethernet transmit positive line, TX+
3	TX– Ethernet	Ethernet transmit negative line, TX-
4	RX+ Ethernet	Ethernet receive positive line, RX+
5	GND	Main board GND
6	GND	Main board GND
7	RX- Ethernet	Ethernet receive negative line, RX-
8	CH_ON_OFF_OUT1_5V	ON/OFF control line from Transceiver to Control Head
9	CH_ON_OFF_IN1_5V	ON/OFF control line from Control Head to Transceiver
10	FLT_A+ (12 V)	The voltage supply for the Control Head from power supply or battery

Table 66: 25-Pin Back Connector

Pin	Function	Description
1	GPIO_9	Output: Active for duration of call (car radio mute)
2	GPIO_6	External PTT for MIC_HF1, Ethernet Control Head GPIO6
3	GPIO_8	Control Head GPIO2 (CPS configurable)
4	GPIO_3	GCAI PIN 2 GPIO
5	VBUS_1B	+5 V Supply, Connected to Pin 6 of Mobile Microphone Port
6	REAR_D -	Rear handset D+ line
7	REAR_D +	Rear handset D- line
8	GPIO_0	GCAI Pin 10 GPIO
9	EXT_PWR_12V	External power supply, 12 V or 24 V for External Speaker
10	1_Wire	1-wire®bi-directional serial bus, Connected to GCAI Pin 1 of Mobile Microphone Port
11	MIC_HF1_GND	Ground for external microphone MIC_HF_1
12	MIC_HF1	External microphone input (MIC_HF1), Nominal sensitivity: 80 mV rms, Bias voltage: 9.3 V or 2.1 V (Selected accessory dependent)
13	GND	GND Common Ground
14	GPIO_5	Control Head GPIO1 (CPS configured/enabled)
15	GPIO_7	4 Level Analogue Input, 33k to 5.0V PU

| Pin	Function	Description
16	1_WIRE	1-wire®bi-directional serial bus,
		Dedicated to power-up detection of IMPRES Visor Mic (input MIC_HF1)
17	REAR_AUDIO	Handset VOL controlled audio output,
		Min RL = 150 Ω unbalanced,
		Connected to GCAI Pin 3 Mobile Microphone Port Connector
18	GND	GND,
		Connected to GCAI Pin 5 Mobile Microphone Port
19	MIC_MMP_REAR	Rear microphone input MIC_MMP_REAR,
		Input 80 mV rms, Bias voltage 7.7 V,
		Connected to GCAI Pin 7 Mobile Microphone Port
20	GPIO_4	GPIO, Hook Input,
		Connected to GCAI Pin 9 Mobile Microphone Port.
21	SPK +	Speaker positive line
		⚠ **WARNING:** Do not ground!
22	SPK –	Speaker negative line
		⚠ **WARNING:** Do not ground!
23	MIC_HF2_GND	Ground for external MIC_HF2
24	MIC_HF2	Second external microphone input MIC_HF2,
		Nominal sensitivity 80 mV rms, CPS selectable bias voltage 7.7 V or 2 V
25	RM_ON	Turn on Control Head through accessories

5.8
Connecting Cables

5.8.1
Motorcycle Mount TELCO Cable

Motorcycle Mount TELCO Cable (to connect Motorcycle Mount Enhanced Control Head to the Remote Head Enhanced/Data Expansion Head Enhanced). Part Number: PMKN4030_, Length: 2.3 m (7.55 ft)

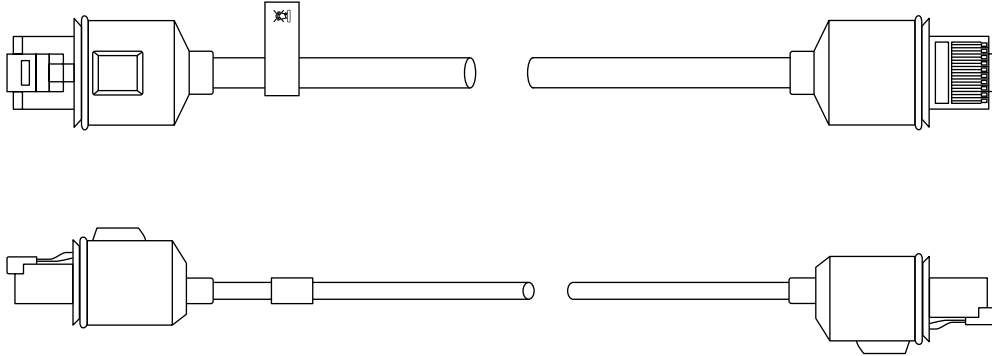**Figure 66: Motorcycle Mount TELCO Cable**
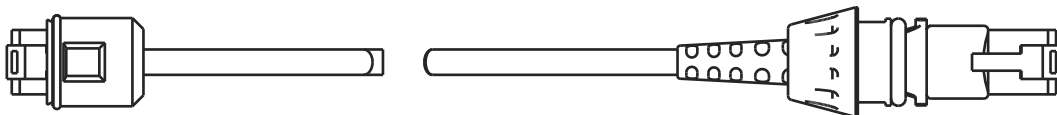
5.8.2
Remote Mount Cables

Remote Mount Cables (to connect Remote Mount Enhanced Control Head to the Remote/Expansion Head) – RKN4077/8/9, PMKN4020
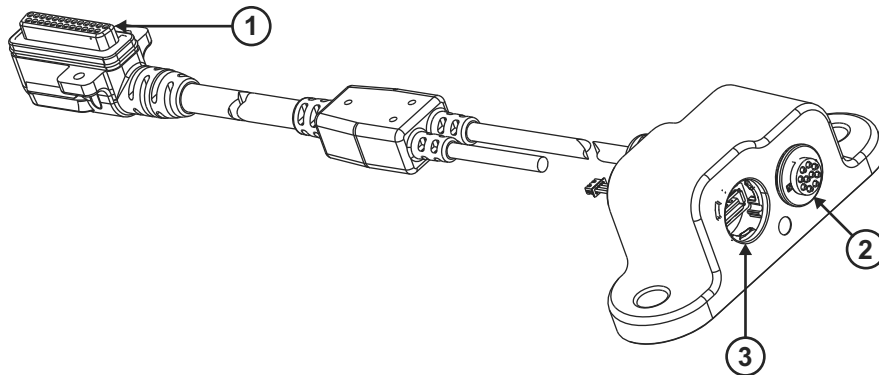
Figure 67: Remote Mount Cable

5.8.3
Accessories Expansion Cable

Accessories Expansion Cable (to connect Remote Mount Enhanced Control Head/Motorcycle Mount Enhanced Control Head to accessories). Part Number: PMKN4029_

Figure 68: Accessories Expansion Cable

Number	Description
1	subD Connector
2	Mobile Microphone Port
3	USB Connector

Table 67: Accessories Expansion Cable — Connections

USB A JACK	Signal	subD 25 Pos
1	VBUS	9
2	D-	22
3	D+	21
4	Ground	18

Mobile Microphone Port (MMP)		
1	1_WIRE	16
2	GPIO_3 / OTG-ID / RTSc (PTT)	4
3	Speaker to Headset	17
4	GPIO_2 / D- / RxDc	6
5	GND (Ground)	N/A
6	Opt_5V / VBUS	5
7	Mic+	19
8	GPIO_1 / D+ / TxDc	7
9	GPIO_4 / CTSc / Keyfail (HOOK)	20
10	GPIO_0 / Pwr On	8
Customised Wire Color		
BROWN / BLACK	GPIO_9	1
ORANGE / BLACK	GPIO_6	2
YELLOW / BLACK	GPIO_8	3
LIGHT BLUE	GPIO_2	6
TURQUOISE	GPIO_1	7
GREEN / BLACK	TX	10
BLUE / BLACK	RX	11
GRAY / BLACK	MIC_2	12
BLUE	Ground	13
PINK / BLACK	GPIO_5	14
BLACK / WHITE	GPI_7	15
USB A JACK	**Signal**	**subD 25 Pos**
BROWN / WHITE	RTS	23
RED / WHITE	CTS	24
ORANGE / WHITE	Power On	25
RED / BLACK	Headset	17
YELLOW / WHITE	Ground	N/A

Connector and Pin Assignment for Cradle (Telephone Style Control Head)

Figure 69: View of the Ethernet Expansion Head Connectors
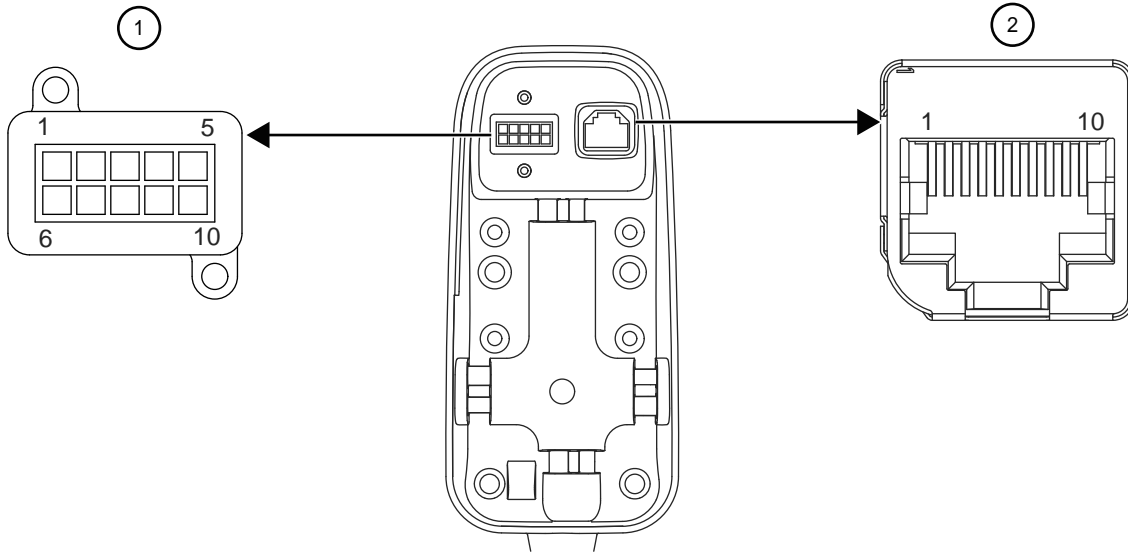
There are two connectors at the back of the TSCH Cradle:

* 10-PIN Audio Connector
* RJ50 Connector

See the following tables for the Pin assignments of the 10-PIN Audio Connector and the RJ50 Connector.

Table 68: Pin Assignment of the 10-Pin Audio Connector – Telephone Style Control Head

PIN	Function	Description
1	EXT_PWR_12	This is the external voltage supply (12 V or 24 V) from power supply or battery for external speaker
2	PTT2	CPS configurable GPIO
3	PTT1	External PTT (for HF MIC 2)
4	EMERGENCY_FT_SW	Emergency signal line from external MIC
5	EXT_MIC	External MIC input line
6	GND	Main board GND
7	SPKR+	Output to External Speaker
8	SPKR-	Output to External Speaker
9	1-WIRE	1-Wire® bi-directional serial bus for accessories ID identification
10	Analog Ground	Analog Ground

Table 69: Pin Assignment of the 10-Pin RJ50 Connector – Telephone Style Control Head

PIN	Function	Description
1	FLT_A+ (12 V)	This is the voltage supply for the Control Head from power supply or battery. The maximum current is 300 mA
2	ETH_TX_POS	Ethernet transmit positive line, TX+
3	ETH_TX_NEG	Ethernet transmit negative line, TX-
4	ETH_RX_POS	Ethernet receive positive line, RX+
5	GND	Main board GND
6	GND	Main board GND
7	ETH_RX_NEG	Ethernet receive negative line, RX-
8	CH_ON_OFF_OUT1_5V	ON/OFF control line from Transceiver to Control Head
9	CH_ON_OFF_IN1_5V	ON/OFF control line from Control Head to Transceiver
10	FLT_A+ (12 V)	This is the voltage supply for the Control Head from power supply or battery. The maximum current is 300 mA

5.8.5
Ethernet Cables

Figure 70: Mobile to Control Head Ethernet Cable Pin Diagram

		CONNECTION				
EEH	PI	WIRE COLOR		AWG SIZE	P2	CH
12V	1	RED		26	1	12V
GND	5	BLACK		26	5	GND
TX+	2	GREEN		26	2	TX+
TX-	3	GREEN/WHITE		26	3	TX-
RX+	4	BLUE		26	4	RX+
RX-	7	BLUE/WHITE		26	7	RX-
GND	6	BROWN		26	6	GND
12V	10	YELLOW		26	10	12V
CH ON/OFF OUT	8	ORANGE		26	8	CH ON/OFF OUT
CH ON/OFF IN	9	GRAY		26	9	CH ON/OFF IN
SHELL		DRAIN		24		CUT

Figure 71: Mobile to Mobile Ethernet Cable Pin Diagram

		CONNECTION			
BRICK 1	P1	COLOR		P2	BRICK 2
TX+	2	GREEN		4	RX+
TX-	3	GREEN / WHITE		7	RX-
RX+	4	BLUE		2	TX+
RX-	7	BLUE / WHITE		3	TX-
GND	5	BLACK		5	GND
GND	6	BROWN		6	GND
CH ON OFF OUT	8	ORANGE		9	CH ON OFF IN
CH ON OFF IN	9	GRAY		8	CH ON OFF OUT
SHIELD		DRAIN			SHIELD

5.8.6

Remote Ethernet Control Head Y-Cable (Accessories Expansion Cable)

Part Number: PMKN4133_

Figure 72: RECH Y-Cable Pin Diagram

P1	SIGNAL NAME	WIRE COLOR(CABLE 1)	SR MOLD	WIRE COLOR	P2	P3	P4	P5	P6
16	1_WIRE	BLACK 28#		CABLE 1/BLACK 28#	1				
4	GPIO_3/PTT(GCAI)	YELLOW 28#		CABLE 1/YELLOW 28#	2				
17	REAR_AUDIO	GREEN 28#		CABLE 1/GREEN 28#	3				
5	VBUS_1B	WHITE 26#		CABLE 1/WHITE 26#	6				
18	MC_MMP_REAR GND	DRAIN 26#		CABLE 1/DRAIN 26#	5				
19	MIC_MMP_REAR	WHITE 28#		CABLE 1/WHITE 28#	7				
6	REAR_D−	BROWN 28#		CABLE 1/BROWN 28#	4				
7	REAR_D+	ORANGE 28#		CABLE 1/ORANGE 28#	8				
20	GPIO_4	BLUE 28#		CABLE 1/BLUE 28#	9				
−	GPIO_0	GRAY 28#		CABLE 1/GRAY 28#	10				
1	GPIO_9	BROWN/BLACK 28#		CABLE 2/BROWN 28#		OPEN			
−	GPIO_6/PTT1	ORANGE/BLACK 28#		CABLE 2/ORANGE 28#		OPEN			
3	GPIO_8/PTT2	YELLOW/BLACK 28#		CABLE 2/YELLOW 28#		OPEN			
10	1_WIRE	GREEN/BLACK 28#		CABLE 2/GREEN 28#		OPEN			
11	MIC_HF1_GND(ANALOG_GND_2)	PINK 28#		CABLE 2/PINK 28#		OPEN			
12	MIC_HF1	PURPLE 28#		CABLE 2/PURPLE 28#		OPEN			
13	GND	DRAIN*3 26#		CABLE 2/DRAIN*3 26#		OPEN			
14	GPIO_5	BLUE/BLACK 28#		CABLE 2/BLUE 28#		OPEN			
15	GPI_7	GRAY/BLACK 28#		CABLE 2/GRAY 28#		OPEN			
17	REAR_AUDIO	PINK/BLACK 28#		CABLE 2/RED 28#		OPEN			
23	MIC_HF2_GND(ANALOG_GND_1)	LIGHT BLUE 28#		CABLE 2/LIGHT BLUE 28#		OPEN			
24	MIC_HF2	LIGHT GREEN 28#		CABLE 2/LIGHT GREEN 28#		OPEN			
21	SPKR+	BROWN 20#		CABLE 4/BROWN 20#					OPEN
22	SPKR−	ORANGE 20#		CABLE 4/ORANGE 20#					OPEN
25	PWR_ON	TAN 28#		CABLE 2/BLACK 28#		OPEN			
9	EXT_PWR_12/24V	RED 20#		CABLE 3/RED 20#+FUSE			OPEN		
18	GND	BLACK 20#		CABLE 3/BLACK 20#				OPEN	

5.8.7

Telephone Style Control Head Y-Cable (Accessories Expansion Cable)

Part Number: PMKN4134_

Figure 73: TSCH Y-Cable Pin Diagram

P1	SIGNAL NAME	WIRE COLOR(CABLE 1)	SR MOLD	WIRE COLOR	P2	P3	P4	P5
2	PTT2/GPI2	BLACK 28#		CABLE 2/BLACK 28#	OPEN			
3	PTT1/GPI1	GREEN 28#		CABLE 2/GREEN 28#	OPEN			
4	Emergency	BLUE 28#		CABLE 2/BLUE 28#	OPEN			
7	Speaker+	BROWN 20#		CABLE 3/BROWN 20#				OPEN
8	Speaker−	ORANGE 20#		CABLE 3/ORANGE 20#				OPEN
5	Microphone Input	RED 28#		CABLE 2/RED 28#	OPEN			
10	Analog Ground	WHITE 28#		CABLE 2/WHITE 28#	OPEN			
9	1−WIRE	YELLOW 28#		CABLE 2/YELLOW 28#	OPEN			
1	External Power 12/24V	RED 20#		CABLE 4/RED 20#+FUSE		OPEN		
6	Power Ground	BLACK+DRAIN 24#		CABLE 4/BLACK+DRAIN 24#	OPEN		OPEN	

5.8.8
Radio-to-Junction Box

Part Number: PMKN4101_, Length: 6 m (19.69 ft)

Figure 74: Connecting Cable - Radio-to-Junction Box
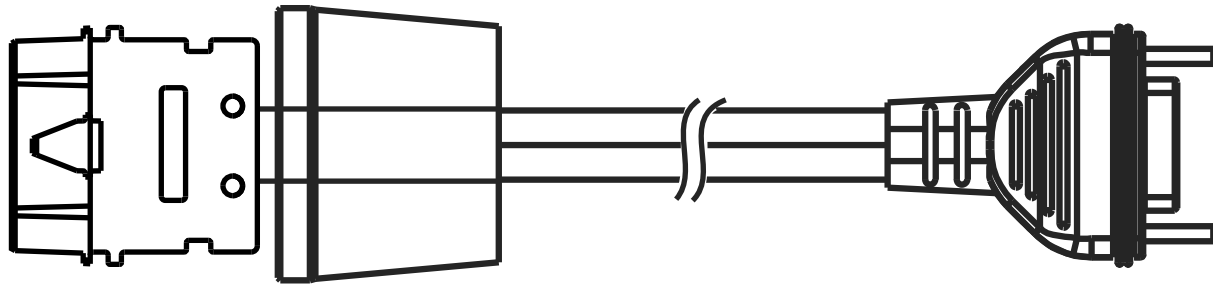
TERMINAL ACCESSORY CONNECTOR
26-Pin AMP

JUNCTION BOX CONNECTOR
20-Pin subD

Pin	From (Signal Name)	Wire Gage	Wire Colour		Pin	To (Signal Name)
1	USB_D+					
2	USB_D-					
3	USB_VBUS					
4	GND (USB)					
5	1 WIRE APM					
6	KEYFAIL/FLASH	26	GREY		19	KEYFAIL/FLASH
7	SWB+	20	RED		6	SWB+
8	GND (PWR, GPIO, VIP)	20	WHITE		4	D_GND
9	SPEAKER-	20	BLUE	TWISTED PAIR	3	SPKR-
10	SPEAKER+	20	BROWN		1	SPKR+
11	TX_AUDIO	26	TAN		5	TX_AUDIO
12	AN_GND		DRAIN X2	SHIELDED	9	AUDIO_GND
13	MIC1	26	RED		11	EXT_MIC
14	RX_AUDIO	26	WHITE/BLACK		2	RX_AUDIO
15	MIC2					
16	GND (MIC)					
17	EXT_PTT	26	YELLOW/BLACK		22	EXT_PTT
18	SCI_DTR	26	GREEN/WHITE		16	DTR
19	HOOK/AUDIO PA	26	BLUE/YELLOW		7	HOOK
					8	AUDIO_PA_ENA
20	SCI_TXD	26	GREEN	SHIELDED	13	RX (UART TX)
22	SCI_RXD	26	VIOLET	TWISTED PAIR	23	TX (UART RX)
21	RS232_RTS	26	ORANGE	TWISTED PAIR	18	RTS
24	RS232_CTS	26	RED		14	CTS
23	EMERGENCY	26	GREEN/BLACK		21	EMERGENCY
25	IGNITION	26	PINK		15	IGNITION
26	EXT_ALARM	26	BLUE/WHITE		20	EXT_ALARM

NOTICE: The keypad labeling of the control head may vary according to the specific customer/country concerns.

5.8.9
Data Expansion Head Enhanced Radio-to-Data Device

This is a standardized RS232 cable (not provided by Motorola Solutions). To connect this cable with the data device, use the 9-pin socket on the front side of the Data Expansion Head Enhanced Radio.

Figure 75: Standardized RS232 Cable
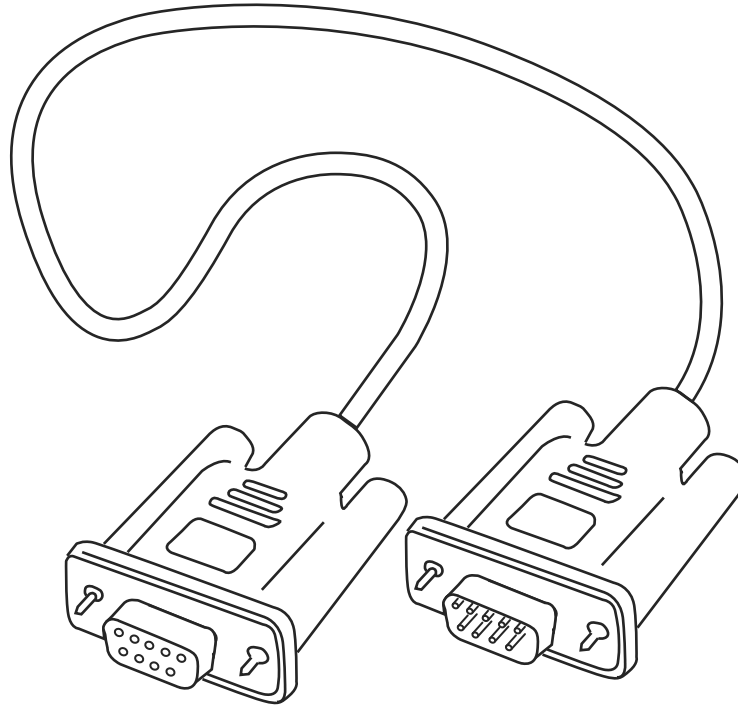
> 📝 **NOTICE:** The Data Expansion Head Enhanced has a protection grade of IP54. To maintain IP54 sealing when connecting an RS232 data cable make sure to use an IP54 specified cable (example: ROLINE AT-Modem cable ST-BU 1.8 m order no. 11.01.4518).

5.8.10
Data Expansion Head Enhanced Radio-to-Fist Microphone

The GMKN4072_ Connecting Cable replaces the existing coiled cord cable of the fist microphone (Motorola Solutions Part Number: GMMN4063_).

> 📝 **NOTICE:** The GMKN4072_ originally is terminated with a 20-pin connector. To recrimp it, use the PMLN5072_ accessory connector kit.

Operation

Connect the crimped wires of the cable into the 26-pin Accessory Connector (delivered with speaker RSN4002_) and then plugged into the 26-pin connector on the rear side of the radio. The other end has a connector which fits into the fist microphone housing.

Making Connections

First connect the exposed four wires to the 26-pin Accessory Connector as shown in Figure 1: Power Cabling Routing to Engine Compartment on page 37 and then plug the connector block into the 26-pin accessory socket on the rear side of the radio. The connector block plugs into the 26-pin accessory connector (four outside pins do not connect).

5.8.10.1
Removing the Existing Coiled Cord Cable

Procedure:

1 Rotate the locking collar at the base of the microphone in a counterclockwise direction until it stops.

2 Pull out the cord and away from the base of the microphone.

3 Install the new coiled cord GMKN4072_ in a reverse order of removal.

   Part Number: GMKN4072_, Length: 65 cm (2.2 ft)

   Figure 76: Pin Assignment of Cable from Accessory Connector to Microphone Housing
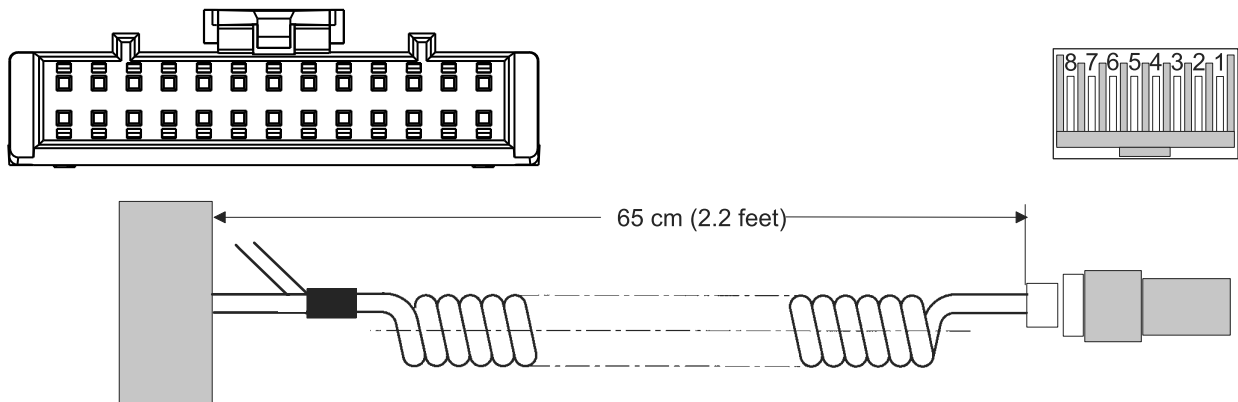
Table 70: Pin Assignment of Cable from Accessory Connector to Microphone Housing

To Accessory Connector (left)		To Microphone Housing (right)	
1	nc	1	nc
...	...	2	nc
11	nc	3	PTT (white)
12	GND (black)	4	EXT_MIC (blue)
13	EXT_MIC (blue)	5	GND (black)
14	nc	6	HOOK (red)
15	nc	7	nc
16	nc	8	nc
17	EXT_PTT (white)		
18	nc		
19	HOOK (red)		
20	nc		
...	...		
26	nc		

5.8.11
Cables to Provision AIE/E2E Keys

The following cables are used when provisioning the radio with encryption keys: PMKN4104_ - Active Data Cable to provision the radio with Air interface encryption keys, and PMKN4108_ - KVL cable to provision the radio with E2E keys.

The PMKN4104_ Active Data Cable provides a 5-wire RS232 interface (for example, RxD, TxD, CTS, RTS, DTR) between a computer and a mobile radio. Connect the cable to the 26-pin Accessory Connector on the rear side of the radio and into the 9-pin connector of a Data Device (for example, PC, Laptop, console). The PMKN4104_ Active Data Cable is not repairable. Order a replacement cable as necessary: Length: 2.0 m (6.56 ft).

Figure 77: Active Data Cable PMKN4104_
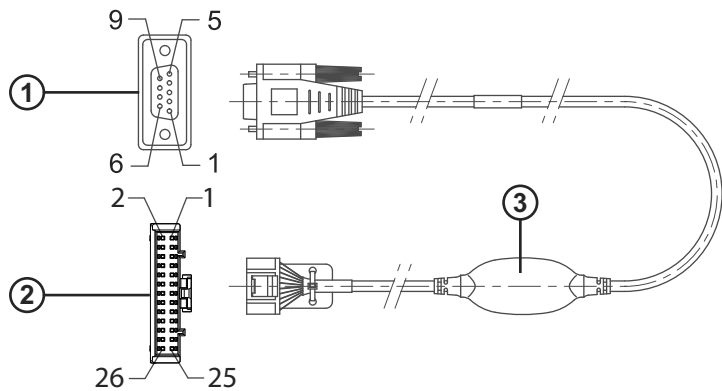
Number	Description
1	To the computer
2	To Radio Accessory Connector
3	Radio Interface Box

Table 71: Pin Assignment - Active Data Cable PMKN4104_

26-Pin Connector	Function	Colour
17	Ext PTT (+5V)	Black
8	GND_MAIN	Yellow
7	SWB+	Brown
18	DTR	Red
24	CTS	White
21	RTS	Blue
20	TxD	Gray
22	RxD	Tan

External Equipment Installation

6.1
Vehicle Antenna Installation

6.1.1
Mobile Radio Operation and EME Exposure

To assure optimal radio performance and that human exposure to radio frequency electromagnetic energy is within the guidelines referenced in this document, transmit only when people outside the vehicle are at least the minimum recommended distance (90 cm or 3 ft) from the body of a vehicle with a properly installed, externally mounted antenna.

6.1.2
Selecting an Antenna Site

When and where to use: To assure optimum performance and compliance with RF Energy Safety standards, these antenna installation guidelines and instructions are limited to metal-body vehicles with appropriate ground planes and take into account the potential exposure of back seat passengers and bystanders outside the vehicle.

Procedure:

1 Install the vehicle antenna external to the vehicle and in accordance with:

  • The requirements of the antenna manufacturer/supplier

  • The requirements of the vehicle manufacturer

2 Select an Antenna Site/Location on a Metal Body Vehicle.

  a External installation – Check the requirements of the antenna supplier and install the vehicle antenna external to a metal body vehicle in accordance with those requirements.

  b Roof top – For optimum performance and compliance with RF Energy Safety standards, mount the antenna in the center area of the roof.

  c Trunk lid – On some vehicles with clearly defined, flat trunk lids, the antennas of some radio models can also be mounted on the center area of the trunk lid. For vehicles without clearly defined, flat trunk lids (such as hatchback autos, sports utility vehicles, and pick-up trucks), mount the antenna in the center area of the roof. The following restrictions apply when mounting the antenna on the trunk lid. Be sure that the distance from the antenna location on the trunk lid is at least 90 cm (36 inches) from the front surface of the rear seat-back to assure compliance with RF Energy Safety standards. Ensure that the trunk lid is grounded by connecting grounding straps between the trunk lid and the vehicle chassis.

  ⚠ **CAUTION:** If these conditions cannot be satisfied, then mount the antenna on the roof top.

3 Ensure that the antenna cable can be easily routed to the radio. Route the antenna cable as far away as possible from any vehicle electronic control units and associated wiring.

  ⚠ **CAUTION:** Make sure that your power cable is not placed with the antenna in parallel. Interference can cause radio to hang.

4 Check the antenna location for any electrical interference according to vehicle manufacturer requirements.

5 The minimum distance between the antenna and the radio/accessories should be at least 91.5 cm (3 feet).

6 Make sure that the mobile radio antenna is installed at least 3 feet (0.9 meter) away from any other antenna on the vehicle.

> **NOTICE:** Any two metal pieces rubbing against each other (such as seat springs, shift levers, trunk and hood lids, exhaust pipes) close to the antenna can cause severe receiver interference.

7 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/GNSS receiver is not covered with any metallic or radio frequency absorbing material.

6.1.3
Installing Antenna

Procedure:

1 Mount the antenna according to the instructions provided with the antenna kit. Run the coaxial cable to the radio mounting location. If necessary, cut off the excess cable and install the cable connector.

2 Connect the antenna cable connector to the radio antenna connector on the rear of the radio.

3 If applicable, connect the GPS antenna to the GPS antenna connector PMKN4114_ on the rear side of the radio.

Figure 78: Connections to the Rear Side of the Radio
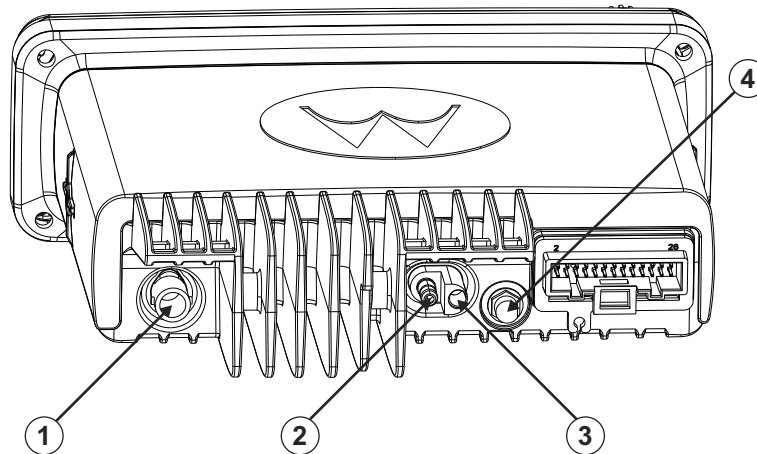
Number	Description
1	Antenna BNC Connector
2	Battery +
3	Battery –
4	GPS Antenna SMA Connector

6.1.4
Completing Radio Installation

Procedure:

1 Mount the microphone clip to a convenient spot near your radio.

2 If your microphone has a telephone-type connector at the end of its cord, plug this connector into the 10-pin TELCO connector of your Junction Box.

⚠ **CAUTION:**

DO NOT use the 10-pin TELCO connector of Data Expansion Head Enhanced or Remote Head Enhanced to plug in a microphone.

3 Plug the power cable into the radio power connector.

NOTICE:
Motorola Solutions supplies a wide range of antennas and associated coaxial cables correctly terminated for use with the mobile radio. However should the need arise to carry out reinstallation or repair of a cable or connector then suitable information on selection and installation of replacement connectors and cables can be found on most recognized connector and cable manufacturers, for example Radiall, Huber and Suhner, Samtec.

The BNC Connector should be typically of the crimped variety, likewise the SMA, or FME Connector used for GPS should also be of the crimped variety. Coaxial cable should be screened and low loss, see the individual specification sheets for the antennas to find details of specific cable types and or connectors. Additionally see the TETRA Interface Specification for the mobile radios for further information.

6.2
Installing External Speaker

Procedure:

1 Remove the speaker from the trunnion bracket by loosening the two wing screws.

2 Choose a place to mount the speaker. When mounting the trunnion on the transmission hump, be careful that the transmission housing is not affected.

3 Use the trunnion bracket as a template to mark the positions of the mounting holes.

4 Centre-punch the spots you marked and drill a 4 mm (5/32-inch) diameter hole at each location.

Figure 79: External Speaker Trunnion Bracket
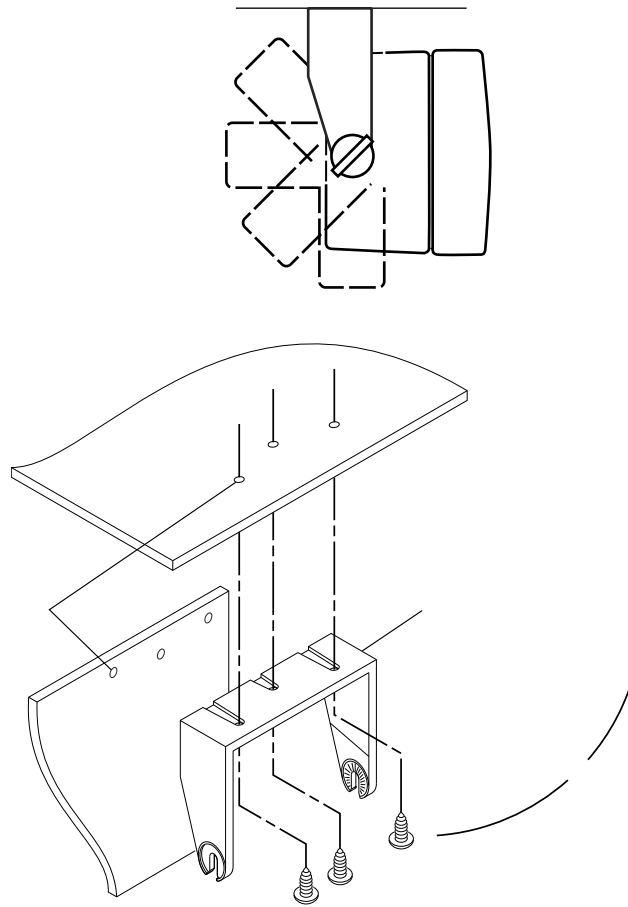
FL0830253-O

5 Mount the trunnion bracket with the screws supplied.

6 Insert the speaker into the trunnion bracket and tighten the two wing screws.

7 Insert the external speaker accessory plug into the accessory connector of the radio.

Service Information – EMEA

Service orders are dealt with by two centres: European Radio Support Centre (ERSC) and European Systems and Components Centre (ESCC). This section contains contact details to service centers in Europe, Middle East, and Africa.

European Radio Support Centre (ERSC)

ERSC provides a remote Technical Support Service to help customers resolve technical issues and quickly restore their systems. The centre handles service orders for subscribers and accessories. This team of highly skilled professionals is available to the customers that have current ERSC service agreements in place. For further information and to verify whether your current service agreement entitles you to benefit from this service, contact your local customer support.

To contact ERSC, use the following EIA Integrated Call Center details:

E-mail: ersc@motorolasolutions.com.

Telephone: +49 (0)30 6686 1555

European Systems and Components Centre (ESCC)

ESCC provides a repair service for infrastructure equipment. Customers requiring a repair service should contact the Customer Information Desk and obtain a Return Material Authorization number. Unless advised otherwise, the equipment should then be shipped to the following address:

Motorola Solutions GmbH, European Systems Component Center, Am Borsigturm 130, 13507 Berlin, Germany

E-mail: escc.admin@motorolasolutions.com.

Telephone: +49 (0)30 6686 1404

Monday to Friday, 08:00am–06:00pm (CET)

Table 72: Service Information — Telephone Numbers to EIA Integrated Call Center

Country	Telephone Number
Austria	1206091087
Denmark	43682114
France	157323434
Germany	6950070204
Italy	291483230
Lithuania	880030828
Netherlands	202061404
Norway	24159815
Portugal	800552277
Russia	810800228 41044 (Alternative 8108001201011)
South Africa	800981900
Spain	912754787

Country	Telephone Number
United Kingdom	2030277499
Other Countries	+42 0533336946

Parts Identification and Ordering

To get help in identification of non-referenced spare parts, contact your local Motorola Solutions Customer Care Organization.

To request replacement parts, kits and assemblies, place orders directly through your Motorola Solutions local distribution organization or through http://emeaonline.motorolasolutions.com.

EIA Test Equipment Support

For information related to support and service of Motorola Solutions Test Equipment, contact your local Motorola Solutions Customer Care Organization or see http://emeaonline.motorolasolutions.com.

For customers in Germany, contact the Equipment Service Group in Germany:

Telephone: +49 (0) 6128 702179

Fax: +49 (0) 6128 951046

Latest Versions of Manuals

To download the latest versions of technical manuals, see http://emeaonline.motorolasolutions.com.

Submit Your Comments

If you have any comments or would like to report a problem regarding Motorola Solutions publications, send an e-mail to: escc.admin@motorolasolutions.com.

Appendix B

Service Information – APAC

This topic contains contact details to service centers in Asia and Pacific region.

Technical Support

Technical support is available to assist the dealer/distributor in resolving any malfunction which may be encountered. Initial contact should be by telephone wherever possible. When contacting Motorola Solutions Technical Support, be prepared to provide the product model number and the serial number.

Further Assistance from Motorola Solutions

You can also contact the Customer Help Desk through the website: http://www.motorolasolutions.com/en_xp/products. If a unit requires further complete testing, knowledge and/or details of component level troubleshooting or service than is customarily performed at the basic level, send the radio to a Motorola Solutions Service Center as listed in the following table:

Table 73: Service Information – Telephone Numbers and Addresses of the Asia and Pacific Motorola Solutions Centers

Country	Telephone Number	Address
Singapore	+65-6352-6383	**Motorola Solutions Singapore Pte. Ltd,** c/o Azure Engineering, 49 Jalan Pemimpin, #03-11 APS Industrial Building, Singapore 577203 Contact: Mareen Phua E-mail: mareen@azure.com.sg Enquiry: Goe Engkiet E-mail: eng-kiet.goe@motorolasolutions.com
Malaysia	+603-7809-0000	**Motorola Solutions Sdn. Bhd.** Level 14, Persoft Tower, No. 68, Pesiaran Tropicana, 47410 Petaling Jaya, Selangor Darul Ehsan, Malaysia Contact: Koh Tiong Eng E-mail: A21001@motorolasolutions.com
Indonesia	+62-21-3043-5239	**PT. Motorola Solutions Indonesia** 30th Floor, Gedung BRI II, Suite 3001, Jl. Jend. Sudirman Kav. 44-46, Jakarta 10210, Indonesia Contact: Eko Haryanto E-mail: Eko.Haryanto@motorolasolutions.com
Thailand	Tel: +662-653-220	**Motorola Solutions (Thailand) Ltd.**

Country	Telephone Number	Address
	Fax: +668-254-5922	142 Two Pacific Place Suite 2201, 3220 Sukhumvit Road, Klongtoey, Bangkok 10110 Contact: Nitas Vatanasupapon E-mail: Nitas@motorolasolutions.com
India	+91-9844218850	**Motorola Solutions India Pvt. Ltd.** C/o Communication Test Design India Private Limited, #4, 5 Maruthi Industrial Estate, Rajapalya, Hoodi Village, Bangalore - 560048, India Contact: K. Umamaheswari E-mail: umamaheshwari@motorolasolutions.com
China	+86-10-8473-5128	**Motorola Solutions (China) Co. Ltd.** No. 1 Wang Jing East Road, Chao Yang District, Beijing, 100102, P.R. China Contact: Sophy Wang E-mail: C18170@motorolasolutions.com
Hong Kong	852-2966-4823	**Motorola Solutions Asia Pacific Ltd.** Unit 1807-1812, 18/F, Two Harbourfront, 22 Tak Fung Street, Hunghom, Kowloon, Hong Kong Contact: Judy Leung E-mail: Judy.Leung@motorolasolutions.com
Philippines	Tel: +632 858-7500 Fax: +632 841-0681	**Motorola Communications Philippines, Inc.** Unit 2102, One Global Place Building, 5th Ave., Bonifacio Global City, Taguig, Philippines 1634. Contact: Arthur Nieves E-mail: Arthur.Nieves@motorolasolutions.com
Korea	+822-3497-3649	**Motorola Solutions Korea, Inc.** 9th Floor, Hibrand Building, 215, Yangjae-Dong, Seocho-Gu, Seoul, 137-924, Korea. Contact: KS Kwak E-mail: r45321@motorolasolutions.com
Taiwan	+886-2-8729 8000	**Motorola Solutions Taiwan, Ltd.** 8F, No. 9, Songgao Rd., Taipei 110,

Country	Telephone Number	Address
		Taiwan (R.O.C.) Contact: Michael Chou E-mail: ftpe239@motorolasolutions.com
Australia	+613-9847-7725	**Motorola Solutions Australia Pty. Ltd.** 10 Wesley Court, Tally Ho Business Park, East Burwood Victoria 3151, Australia. E-mail: servicecentre.au@motorolasolutions.com

Piece Parts

Some replacement parts, spare parts, and/or product information can be ordered directly. If a complete Motorola Solutions part number is assigned to the part, it is available from Motorola Solutions Service Organization. If no part number is assigned, the part is not normally available from Motorola Solutions. If a list of parts is not included, that means that no user-serviceable parts are available for that kit or assembly.

Customer Programming Software has no capability to tune the radio. Tuning the radio can only be performed at the factory or at the appropriate Motorola Solutions Repair Center. Component replacement can affect the radio tuning and must only be performed by the appropriate Motorola Solutions Repair Center.

All orders for parts/information should include the complete Motorola Solutions identification number. All part orders should be directed to your local Motorola Solutions Service Organization. See your latest price pages.

Parts Identification and Ordering

Request for help in identification of non-referenced spare parts should be directed to the Customer Care Organization of Motorola Solutions local area representation. Orders for replacement parts, kits, and assemblies should be placed directly on Motorola Solutions local distribution organization or from the Motorola Solutions Online (Extranet).

Appendix C

Service Information – Americas

This topic contains contact details to service centers in Latin America and Caribbean region.

Technical Support

To request technical support, go to https://businessonline.motorolasolutions.com, **Contact Us**.

Some replacement parts, spare parts, and/or product information can be ordered directly. If a complete Motorola Solutions part number is assigned to the part, it is available from Motorola Solutions. If no part number is assigned, the part is not normally available from Motorola Solutions. If the part number is appended with an asterisk, the part is serviceable by Motorola Solutions Depot only. If a list of parts is not included, that means that no user-serviceable parts are available for that kit or assembly.

Warranty and Repairs

Table 74: Service Information – Telephone Numbers and Addresses of Latin America Radio Support Centers

Country	Telephone Number	Address
Colombia	571- 376-6990	Motorola Solutions de Colombia Service Centre Torre Banco Ganadero Carrera 7 No. 71-52 Torre B piso 13 Oficina 1301 Bogota
Mexico	5252576700	Motorola Solutions de México Service Centre Bosques de Alisos #125 Col. Bosques de las Lomas CP 05120 Mexico DF

Piece Parts

To order parts in Latin America and the Caribbean contact your local Motorola Solutions CGISS representative.

Table 75: Service Information – Telephone Numbers and Addresses of Latin America Motorola Solutions Centers

Country	Telephone Number	Address
Argentina	5411-4317-5300	Motorola Solutions Argentina Ave. del Libertador 1855 B1638BGE, Vicente Lopez Buenos Aires
Brasil	5511-3847-668	Motorola Solutions Ltda Av. Chedid Jafet

Country	Telephone Number	Address
		222 Bloco D Conjuntos 11,12,21,22 E 41 Condominio Millennium Office Park 04551-065- Vila Olimpia, Sao Paulo
Chile	562-338-9000	Motorola Solutions Chile S.A. Av. Nueva Tajamar 481 Edif. World Trade Center Of. 1702, Torre Norte Las Condes Santiago
Colombia	571-376-6990	Motorola Solutions Colombia LTDA. Carrera 7 #71-52 Torre A, Oficina 1301 Bogotá
Costa Rica	506-201-1480	Motorola Solutions de Costa Rica Parque Empresarial Plaza Roble Edificio El Portico, 1er Piso Centro de Negocios Internacional Guachepelin, Escazu San Jose
Ecuador	5932-264-1627	Motorola Solutions del Ecuador Autopist Gral. Rumiñahui, Puente 2 Conjunto Puerta del Sol Este-Ciudad Jardin Pasa E, Casa 65 Quito
Mexico	52-555-257-6700	Motorola Solutions de México, S.A. Calle Bosques de Alisos #125 Col. Bosques de Las Lomas 05120 México D.F.
Peru	511-211-0700	Motorola Solutions del Peru Ave. República de Panama 3535 Piso 11, San Isidro Lima 27
USA	954-723-8959	Motorola Solutions, Inc. Latin American Countries Region 789 International Parkway Sunrise, FL 33325
Venezuela	58212-901-4600	Motorola Solutions de Los Andes C.A. Ave. Francisco de Miranda Centro Lido, Torre A Piso 15, El Rosal Caracas, 1060

Appendix D

Warranty and Service Support

How To Get Warranty Service

In order to receive warranty service, provide proof of purchase (bearing the date of purchase and Product item serial number) and, also, deliver or send the Product item, transportation and insurance prepaid, to an authorized warranty service location. Warranty service is provided by Motorola Solutions through one of its authorized warranty service locations. If you first contact the company which sold you the Product, it can facilitate your obtaining warranty service. You can also call Motorola Solutions at 1-888-567-7347 US/Canada.

Appendix E

Product Specific Information for Digital Terminals Type MT953C/MT853C/MT753C/MT553C

This section gives the Service Personnel an overview about product-specific notes. It is necessary to take special precautions to avoid the introduction of hazards when operating, installing, servicing, or storing equipment. This terminal meets the applicable safety standards if it is used as described. Follow carefully all operating and safety instructions.

Table 76: Equipment Electrical Ratings

Rated Voltage	12 VDC
Rated Voltage Range	10.8 VDC to 15.6 VDC
Rated Current	MT953C (380–430 MHz), MT853C (350–390 MHz), MT753C (806–870 MHz), MT553C (410–470 MHz): 4 A @ 10 W RF power
	Please be aware when planning the installation that there is a maximum current consumption of 4.5 A during PTT and even 30 mA (non-Ethernet)/ 90 mA (Ethernet) when terminal is switched off.
Transmitter Frequency Range	TMO: 380–430 MHz (MT953C), 350–390 MHz (MT853C), 806–870 MHz (MT753C), 410–470 MHz (MT553C)
	DMO: 380–430 MHz (MT953C), 350–390 MHz (MT853C), 851–870 MHz (MT753C), 410–470 MHz (MT553C)
Receiver Frequency Range	380–430 MHz (MT953C), 350–390 MHz (MT853C), 806–870 MHz (MT753C), 851–870 MHz (MT753C), 410–470 MHz (MT553C)

Table 77: Normal Load Conditions

Rated RF Power	10 W
Rated Audio Power	10 W @ 4 Ω; 6 W @ 8 Ω
Antenna Impedance	50 Ω
Operating Temp. Range	-30 °C to +60 °C
Operating Time	Continuous/Intermittent

> **NOTICE:** In general, the communication system determines terminal transmit and receive time (operating cycle time). On overload, respectively on extensive use beyond the systems specifications at high ambient temperatures, the thermal control protects the terminal. The thermal control cuts down the RF output power, thus reducing the terminal coverage range.

Table 78: Fuse Identification

Fuse for Power Cable GKN6270/GKN6274	10 A (Motorola Solutions Part Number: 6500139767)	⚠	**IMPORTANT:** In case of blown fuses during the installation, replace ONLY with fuses of identical value. Never insert ones of different values.
Fuse for Ignition Sense Cable PMKN4120	4 A (Motorola Solutions Part Number: 6580283E02)		