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WASTE MANAGEMENT

The symbol means that the product must be taken to separate collection at the product end-of life. Do not dispose of these products as unsorted municipal waste

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1 ABOUT THIS MANUAL

Thank you for purchasing this PowerTrunk MDT-500 device.

The MDT-500 763-870 MHz can operate in the following frequency bands:

- 763-806 MHz
  For Industry Canada, the frequency range is 768-776 MHz and 798-806 MHz.
  For FCC, the frequency range is 769-775 MHz and 799-805 MHz.
- 806-870 MHz
  For Industry Canada, the frequency range is 806-824 MHz and 851-869 MHz.
  For FCC, the frequency range is 809-824 MHz and 854-869 MHz.

Frequency configuration is only allowed and controlled directly by the grantee (TELTRONIC, S.A.U.).

Advanced services and a wide range of options and accessories will help you obtain the best performance from mobile communications in your work.

This manual will show you how easy it is to use the main features of your new terminal. You will learn how to make a group call, an individual call, how to send status message or how to edit a text message and send it to one or several users.

Before using the equipment, please read this manual carefully.

In addition to instructions on how to handle the device, you will also find safety information, among which the international guidelines on exposure to radio frequency.

Please keep this manual at hand for future reference. For further information, contact your service provider.

At the end of this MDT-500 manual, you will find a Quick Reference Guide. In addition, each unit is supplied with an Installation Guide.

Some functions described in this guide may depend on the configuration and options of the equipment, as well as the firmware version.

Please, contact your service provider for more detailed information about the available features of your equipment.

2 FOR YOUR SAFETY

2.1 General

PowerTrunk has obtained official approval for a wide range of accessories for MDT-500 equipment: antennas, audio accessories, etc. These accessories have undergone all type of tests to ensure their suitability and safety for the use they have been designed for, either vehicle use (MDT-500). Use only PowerTrunk-approved accessories.

For your safety, only have your equipment and accessories repaired by personnel authorised by PowerTrunk. An incorrect installation (*MDT-500 Installation Guide*) or repair could be dangerous and will render your guarantee void.

The equipment has been designed to fulfil the applicable compliance regulations.

The equipment complies with Part 15 of the FCC Title 47 of the Code of Federal Regulations, and with Industry Canada ICES-003. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The equipment complies with the applicable Part 90 of the FCC Title 47 of the Code of Federal Regulations, and the Industry Canada Regulation RSS-119.

The equipment is supplied with an identification label where the following IC Certificate number and the FCC ID are displayed:

- FCC ID WT7PTMDT500760B
- IC 8624A-PTMDT760B

Access scheme is Time division multiple access (TDMA) with 4 physical channels per RF channel. RF Channel Bandwidth (Channel spacing) is 25 KHz. So, the equipment meets a spectrum efficiency of one voice channel per 6.25 KHz of channel bandwidth.

Modulation scheme is π/4-shifted Differential Quaternary Phase Shift Keying (π/4-DQPSK) with 18Ksym/sec. modulation rate, equivalent to 36Kbits/sec. So, the equipment meets a data rate on each physical channel of 9000bits/sec. per 6.25 KHz of channel bandwidth.

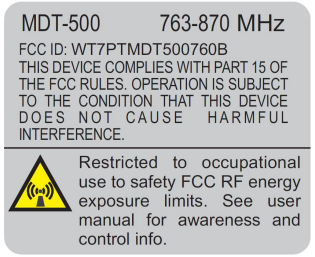
Unapproved modifications or changes to this equipment may cause harmful interference unless the modifications are expressly approved by PowerTrunk. In this case, the user could lose the authority to operate with this equipment.

2.2 RF Exposure Requirements

Your MDT-500 equipment, together with the accessories for which PowerTrunk has obtained official approval, have been designed and manufactured so that they do not exceed the limits of exposure to radio frequency energy established in international guidelines.

These regulations, which are result of periodical scientific trials by independent organisations, include a considerable safety margin, designed to guarantee the safety of all staff, regardless of their age or state of health.

The following label will be placed in conspicuous view on the MDT-500:



MDT-500 is restricted to occupational/controller use to safety RF energy exposure limits. This radio is NOT authorized for general population.

Use only accessories and antennas approved by PowerTrunk. Use of non-approved accessories and antennas may exceed RF energy exposure limits.

This device complies with the MPE requirements by providing a safe separation distance of 35cm between the antenna, which has a maximum gain of 15dBi, including any radiating structure, and any person when normally operated.

Users can obtain Canadian information on RF exposure and compliance at the Industry Canada RSS-102 standard text.

2.3 Electromagnetic compatibility

The majority of electronic devices are susceptible to electromagnetic interference if they are not adequately shielded, designed or configured for electromagnetic compatibility.

To avoid these compatibility conflicts, respect the current regulations of the area you are in, and turn off the terminal whenever its use is prohibited, when it may cause interference or be hazardous, for example, at hospitals or health care premises, where equipment sensitive to external RF radiation may be being used.

Using two devices with antennas in close proximity may cause mutual interference. If this were to occur, separate the antennas until the interference disappears.

2.4 Other warnings

High surface temperature

Warning: Burns may be suffered if the bare part of the antenna is touched during radio equipment transmissions.

Long periods of transmission may cause the rear part of the equipment, where the power amplifier radiator is located, to reach a high temperature.

Vehicles

Vehicular Installation

The MDT-500 terminal must be supplied with a continuous nominal 12V voltage in equipment terminals (minimum 10.8V, maximum 15.6 V).

RF signals may affect motor vehicles' electronic systems if they are not properly installed or well protected. For more information, check these aspects of your vehicle or the equipment you have added with their manufacturers.

MDT-500 equipment has been approved in conformity with European Directive **95/54/CE** to guarantee safety in vehicle installations, due to radio equipment transmissions affecting the vehicle's electronic systems: electronic ignition systems, brake control (ABS), traction or speed control and onboard computer systems.

For correct installation of the equipment, please follow the instructions given in the *MDT-500 Installation Guide*. Avoid using the area above the airbag or the area where it will inflate. Airbags inflate with great force and the equipment could be projected forward and cause serious injuries to vehicle occupants.

Potentially explosive environments

Disconnect the equipment when you are in an area with a potential explosion hazard and comply with all notices and instructions.

Areas with a risk of explosions are often (although not always) indicated. Amongst these are fuel filling areas (Ship decks, petrol stations, installations used for storing and transporting fuel or chemical products) vehicles that use LPG and areas where the air contains particles such as grain, powder or metal particles.

Sparks in these areas can cause explosions or fires, with the resulting risk of injury and even death.

Driver safety

Check the laws and regulations on using mobile phones and radiotelephones in the area where you are to drive and always abide by them. While driving, concentrate all your attention on driving and always have your hands free to manoeuvre the vehicle.

As a precautionary measure, whenever possible, park off the road to make or receive a call.

Programming

The equipment must always be programmed using a version of the programmer that is compatible with the version of firmware.

2.5 Antenna

- Do not use the equipment without an antenna.
- To guarantee safety compliance, always use only antennas validated by PowerTrunk.
- Never use the equipment if the antenna is damaged. If a damaged antenna comes into contact with the skin, it may cause burns.

2.6 Audio accessories

1. Only use accessories approved by PowerTrunk.
2. Follow the guidelines for fitting audio accessories in the *MDT-500 Installation Guide.*

2.7 Maintenance

The following recommendations will help you to increase the service life of the equipment and maintain the guarantee coverage:

1. Do not install the equipment in dirty, damp or dusty locations. It is recommended to install it out of **direct sunlight** and away from **sources of heat**. High temperatures can reduce the service life of electronic components and deform or melt some plastics.
2. Any **liquid** spilt on the equipment can cause serious damage. If this occurs, consult your authorised Technical Service.
3. Use a soft damp cloth for cleaning the outside surfaces. Never use chemical sprays or abrasive cleaning products.

4. Do not store the equipment in cold places. When the device warms up, there may be condensation inside that could damage the electronic circuits.
5. Protect the equipment from impacts or being dropped. Circuit boards and more sensitive mechanical components may get broken.
6. If you observe an error indication on the equipment screen that prevents it from working normally, consult your service provider.
7. **Do not open the equipment** or try to modify it in any way. There are no user-serviceable parts inside and removing the cover will expose you to electrical shocks and other hazards. Any attempt to open the equipment and manipulate it in any way will render your guarantee void.
8. Do not place **heavy objects** on the equipment or on its power cable. A damaged cable could cause shocks or fires.
9. **Only use the power cable** supplied with the equipment.
10. Disconnect the equipment antenna when there are storms, to avoid **lightening** damage**.**

3 FIRST STEPS

3.1 Start-up

1. Keep the key ⏻ pressed to switch the equipment on or off.
2. On **starting-up**, it will display a welcome message (which can be configured by programming). The software version of the equipment and the user's name and address will also be displayed for a few seconds.
3. If the equipment requests a PIN, enter the 4-digit code (by default the code is 0000), which will appear on screen as ****, and press OK. It is recommended to change this code for a safer one that you are able to remember.
4. If the user does not enter a correct PIN code after a number of permitted tries (which can be configured, 3 attempts by default), the equipment will be locked until the personal unlocking code - PUK - is entered (a 10-digit code). This code is provided by your Service Provider.
5. When **switching off** the equipment, it will display a switch-off message and an acoustic warning.

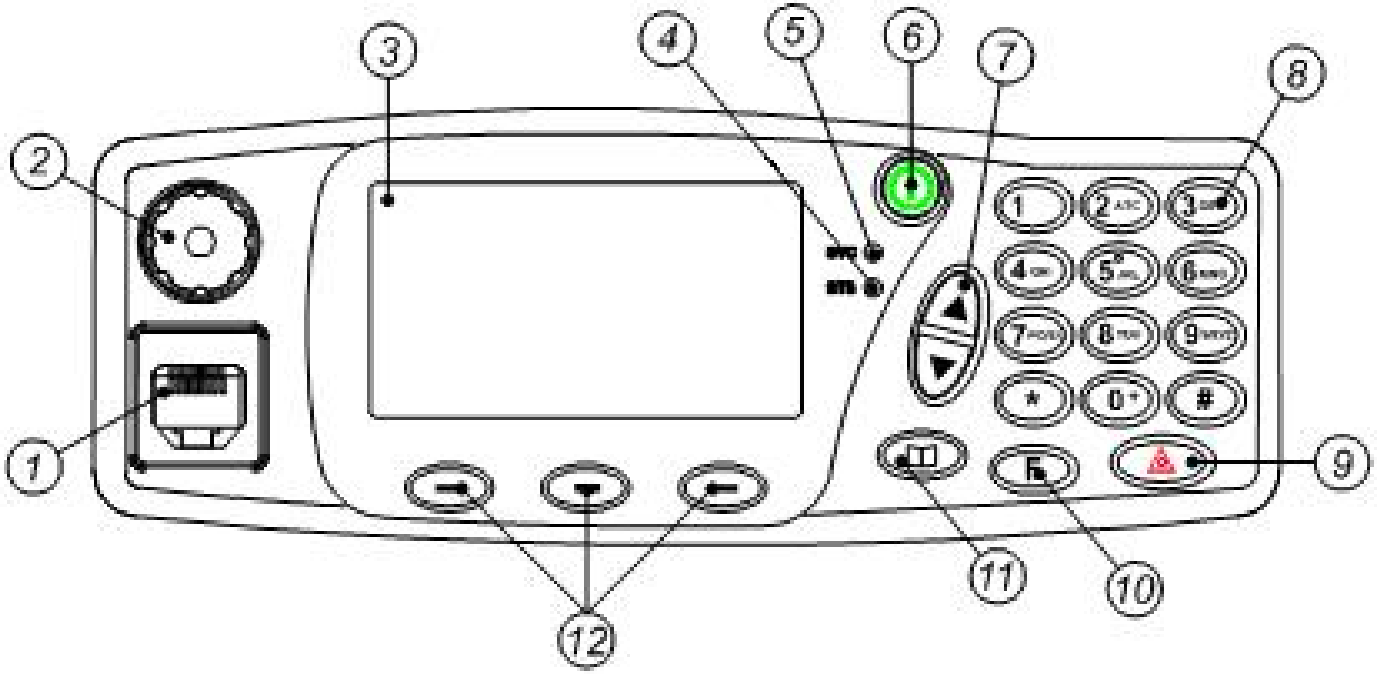
3.2 Working modes.

6. There are three working modes: network mode (V+D), direct mode (DMO) and DMO-GATE mode. In network mode (V+D), the equipment will be operational when the system has been successfully registered. Then the display will show the symbols (Valid network indicator) and (signal level indicator).
7. During the system registration and network access process, the SVC LED will be lit up continuously in red, and when a valid network is found it will flash and try to register into it. When the register is complete, a characteristic programmable acoustic signal will be heard, the SVC LED will turn green and the screen will display the message “In service”. If the equipment is unable to access a network, the display will show “No service” and the SVC LED will stay red. Even if the equipment has not registered, it is possible to access the **Main Menu**, to select the Direct working Mode, for example, without need for infrastructure.
8. In DMO mode, the SVC LED will be green and the symbol (Direct mode active indicator) will be displayed in the symbol line of the display (Upper line). In this mode, the symbol (valid network indicator) is not displayed.
9. If the equipment has the DMO-GATE option available, this working mode can be selected, which will enable the transfer of group calls from the network to terminals in DMO mode and vice versa.
10. The equipment may be configured to start in any of the available modes or it is possible to change the mode manually through the “Working modes” menu.

4 BASIC USE

This manual is common for both equipment models: the MDT-500 mobile equipment and the DT-410 office unit.

Both models have the same front panel, described below.

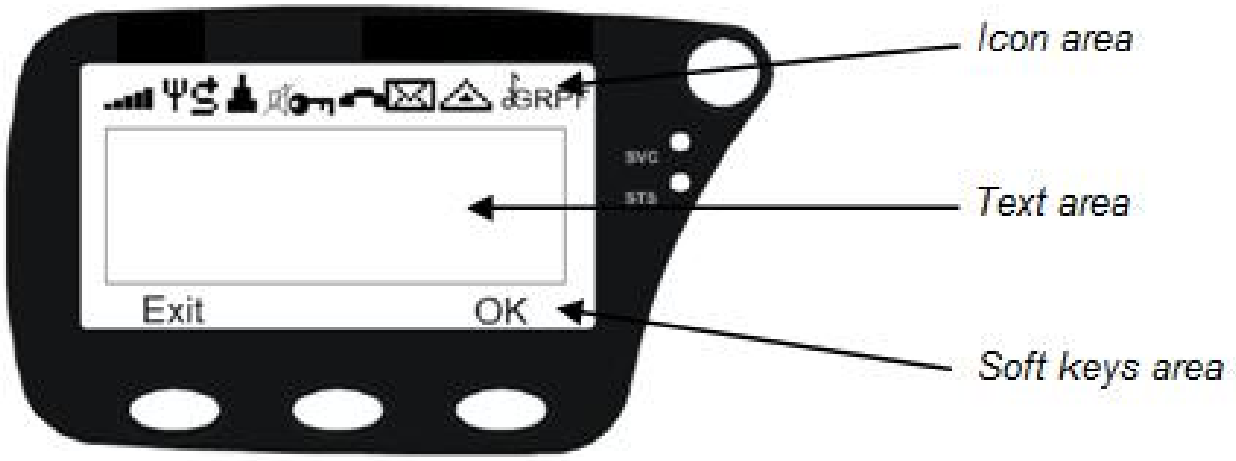


The MDT-500 can also be used without front for data applications using the PEI protocol and audio control through the 600-ohm interface. If your equipment has this configuration, consult with your Service Provider to learn about the services available and how to access them.

No.	Description	Observations
1	Microphone connector	Connector for handheld Microphone or Micro-loudspeaker or desktop microphone (DT-410). Connector for the programming cable.
2	Volume control	Adjusts the volume level. Screen adjustment Contrast, Volume audio and Volume tones.
3	Screen	Alphanumeric display 4 x 16, line of symbols and line of 'soft keys'.
4	STS LED Indicator	Call status indicator.
5	SVC LED Indicator	Service indicator.
6	ON/OFF key	Key to switch on / off
7	Navigation keys	Navigation by menus/submenus and their options. Editing phone books / messages.
8	Alphanumeric keyboard	For entering number and characters. (See section 6.3)
9	Emergency key	Starts / cancels the emergency call.
10	Function key	Combined with other keys, it enables rapid access to certain functions. By continuous pressing, it changes the working mode (V+D<-> DMO)
11	Menu key	Access to Main Menu.
12	Soft keys	Press to select the corresponding on-screen option.

4.1 Display indicators

The on-screen indicators display information about the operation of the equipment:



Symbol	Description
	Signal intensity (RSSI) or level of coverage indicator
	Valid network (Only in V+D network mode)
	Emergency call established (steady). Flashing if the call is being set up.
	Call established
	Message received (steady). Flashing when a message is being sent.
	Discrete mode active. Converts a semi-duplex incoming call with direct signalling to on/off hook signalling.
	All tones off

GRP/BRD/PRV/PHN/PBX	Type of voice call selected: group (GRP), private (PRV), broadcast (BRD), phone (PHN) or through telephone exchange (PBX).
	GPS position valid (steady). Flashing if GPS position is not valid. Will only be displayed if the GPS option is installed in the MDT-500 unit.
	Direct mode (DMO) activated.
	Data packet connection. Steay if the connection has been established. Flashing if data transfer is under way.
	Call diversion activated.
	Inclusion call activated.
F	Access to sequential functions with (F) key.
	Messages received box full
	Steady: Terminal registered in encrypted mode. Encrypted call. Flashing: Terminal registered in encrypted mode. Clear call.
ABC / abc	Text editing screen
	Active group scan (groups in listening mode).
	DMO-GATE mode.
	Presence of a DMO-REP detected in the DMO frequency selected.
	When the terminal has the E2EE module (End to End Encryption) active: Active call with E2EE Encryption. Clear call active.
	Migration. Terminal registered in a different network to its own local one.
	TxI (Transmit Inhibit) functionality. Transmissions temporarily inhibited (except emergency call).

4.2 LED Indicators.

LED indicators display information about equipment operation:

SVC LED	
LED status	Function
Off	Equipment not operational.
Red	Equipment not in service (no network registered).
Flashing red	Equipment in the process of registering.
Green	Equipment in service (Registered on the network). Equipment operational (DMO).
Flashing orange	Equipment in programming mode

STS LED	
LED status	Function
Off	No call being carried out.
Red	Equipment transmitting a call. PTT pressed (semi-duplex call) or until the communication is over (duplex call, only in TMO –trunking mode).
Flashing red	Request or end of transmission.
Green	Equipment receiving a call.
Flashing green	Call in progress, no one transmitting.
Orange	Call being established.

If the two LEDs (SVC and STS) are orange, this indicates an error. If this occurs consult your Service Provider.

4.3 List of editable characters

The following table displays the characters available for editing texts on the MDT-500 and DT-410.

Keys	Screen characters										
	Number of times to press the key										
	1	2	3	4	5	6	7	8	9	10	11
1	Space	.	1	,	&	$	@	#	¿	?	¡
	!	:	;	_	“	’					
2 ABC	A a	B b	C c	2	Á á	À à	Â â	Ã ã	Ä ä	Å å	Ç ç
3 DEF	D d	E e	F f	3	É é	È è	Ê ê	Ë ë			
4 GHI	G g	H h	I i	4	Í í	Ì ì	Î î	Ï ï			
5 JKL	J j	K k	L l	5							
6 MNO	M m	N n	O o	Ñ ñ	6	Ó ó	Ò ò	Ô ô	Õ õ	Ö ö	
7 PQRS	P p	Q q	R r	S s	7						
8 TUV	T t	U u	V v	8	Ú ú	Ù ù	Û û	Ü ü			
9 WXYZ	W w	X x	Y y	Z z	9						
0 +	+]	- {	0 }	= <	* >	÷	/	\	(	)	[

4.4 Main screen

The main screen is that of Voice Calls (in V+D network mode) – Group mode.

The equipment will be prepared to press PTT (Press-to-talk) and directly launch a call to the group selected.

The basic information viewed on this screen consists of the range the selected group belongs to, the name of the group and its status.

The soft key **'Mode'** (Lower right-hand side of the screen) enables selection between other types of call (private, telephone, PABX). If desired, automatic return to the preferred type of call can be programmed after a few seconds.