GUIDELINEGEO | ABEM

ABEM WalkTEM TX-60

User Guide


ABEM
WALKTEM TX-60

WARNING!

The ABEM TX-60 transmitter delivers high voltages and currents. Always consider all cables connected directly or indirectly to the ABEM TX-60 to carry current.

Stay away from cables, connectors and batteries while the system is operating. Wear electrically insulating boots and gloves during fieldwork. Disconnect power cables from ABEM TX-60 before connecting / disconnecting transmitter loops to / from the ABEM TX-60.

To avoid accident the operator must always keep all parts of the equipment including instrument, cables, connectors etc. under control for unauthorized persons and stray animals while the system is operating!

Our thanks...

Thank you for choosing Guideline Geo and ABEM as your WalkTEM solution provider. The very core of our corporate philosophy is to provide our users with the very best products, support and services. Our development team is committed to providing you with the most technologically advanced and easy-to-use WalkTEM products with the capability to meet your needs for efficiency and productivity now, and into the future.

Whether this is your first ABEM product, or an addition to the ABEM collection, we believe that a small investment of your time, to familiarize yourself with the product by reading this manual, will be rewarded with a significant increase in productivity and satisfaction.

At Guideline Geo, we welcome comments concerning the use and experience with our products, as well as the contents and usefulness of this manual.

Guideline Geo team

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Guideline Geo AB

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Contents

Introduction

This User's Guide is written as a short introduction to using the ABEM TX-60 external transmitter in the field. It provides a basic introduction to the components that make up the ABEM TX-60 system and how these are put together and laid out in the field.

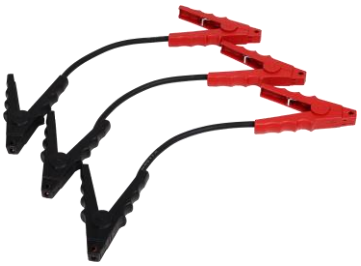
This User's Guide is a complement to the ABEM WalkTEM User's Guide, and only covers additional sections that involve the ABEM TX-60 external transmitter.

ABEM TX-60 Components

The ABEM TX-60 kit is made up of a number of components, some of which are always included, and optional components used to configure the system to each client's needs.

The ABEM TX-60 base kit includes the following:

Part description	Article number	
ABEM TX-60 transmitter base unit	33 8100 01	
Office power supply	39 0450 16	
ABEM TX-60 loop lead-in cable	33 8200 19	

ABEM TX-60 loop power cable	33 8100 21	
External logic power cable	33 3000 42	
Synchronization cable, 1.5 m	33 8500 66	
Battery serial interlink cable, x3	33 8100 22	
USB to serial COM port adapter	39 9100 09	
Serial communication cable	49 6000 13	
ABEM TX-60 User's Guide	33 8100 97	
Warranty card	38 5000 03	

The ABEM TX-60 Transmitter - overview

The ABEM TX-60 is designed to replace the internal transmitter of the WalkTEM instrument or the TX-8 / TX-20 of the WalkTEM 2, when more output power is needed. The TX-60 functions are powered by a built-in 8Ah 12VDC battery pack, or from an external power source of 10-34 VDC. The transmitter loop is always powered from its own external power source of 24-250 VDC. Increasing the external voltage increases current in the TX loop until one of the following maximums is met: 250V external voltage, 60A in the TX loop, or 5kW power output (the product of external voltage and loop current). The transmitter loop connects to the ABEM TX-60 transmitter via the transmitter loop lead-in cable (which links the transmitter coil to the red and black transmitter output connectors).

Note: It is recommended to use an external power source for the ABEM TX-60 control functions as this will prolong the operation time.

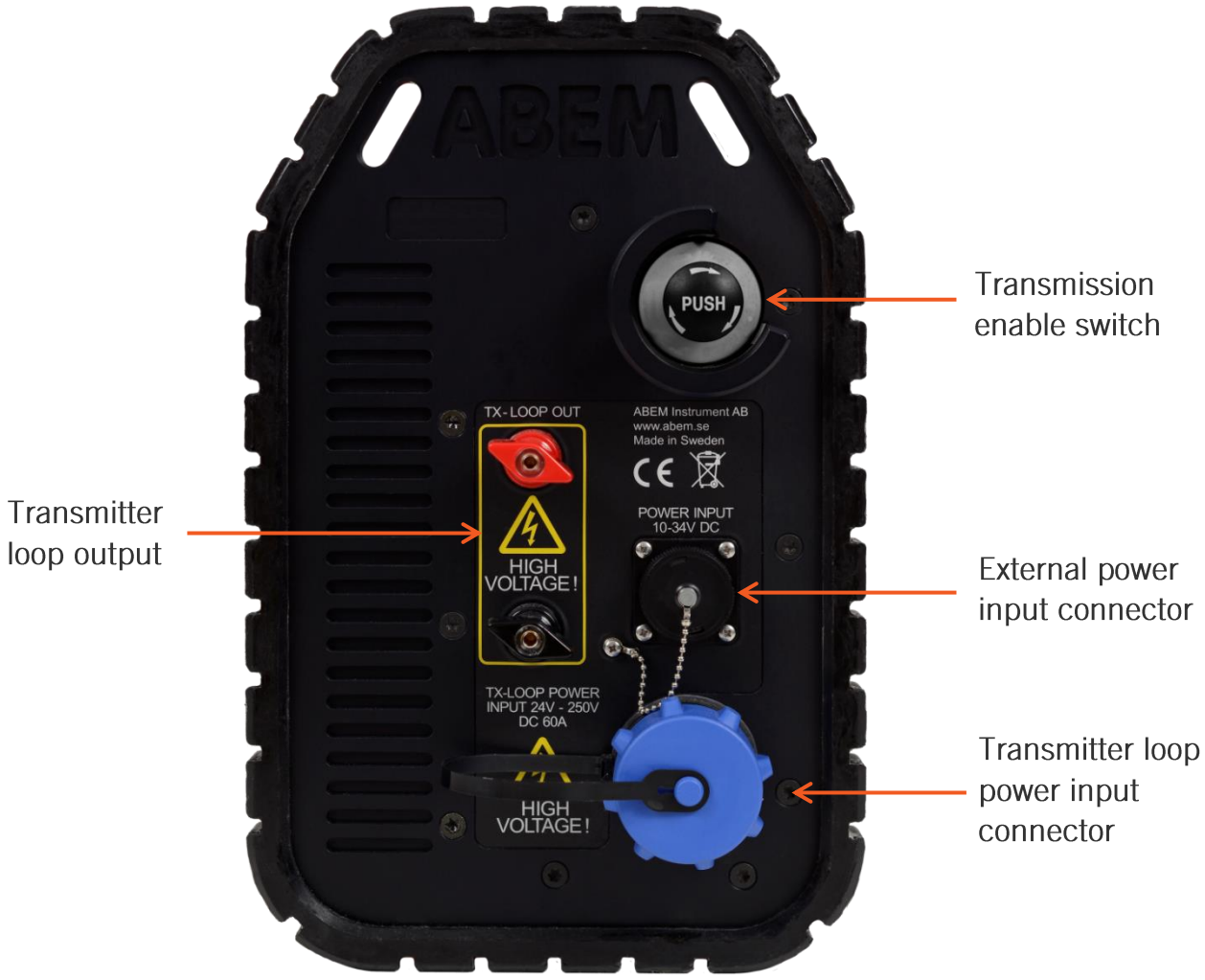


Figure 1. The transmitter side of ABEM TX-60

Note: Care should be taken to ensure all connectors are clean prior to making any connections.

On the left side of the ABEM TX-60 is where all power and transmitter loop connections are located. Also, an enable switch is integrated and permits transmission to be disabled as a precaution during setup and take down of the equipment.

Figure 2. The synchronization side of ABEM TX-60

On the right side of the ABEM TX-60 is where the control and synchronization cable connects. It synchronizes the ABEM TX-60 with the ABEM WalkTEM unit.

The Management port is used for service actions only.

Internal battery pack

The ABEM TX-60 unit incorporates a separate battery pack for the control circuitry and internal cooling fans. It is also possible, and recommended, to connect an external power source which then will power the control circuits and cooling fans.

Battery charger

The ABEM TX-60 unit has a built-in charger for the internal battery, which can be charged from an external power source. The battery charger will run if an external power source is connected and the input voltage is in the range of 12.8 to 34 V. The internal battery pack can also be charged using the supplied office power supply which connects to a mains (220/110 volt) power point.

Note: The ABEM TX-60 needs to be **powered on** for the charging of internal battery to take place.

Computer

A logic controller is incorporated into the ABEM TX-60 unit. It controls the communication, buttons and LED's on the front panel as well as the speed of the internal cooling fans.

GPS

The ABEM TX-60 unit has a built-in GPS connected to the internal logic controller.

Setup

Field layout

Field layout is similar to the procedure when only using the ABEM WalkTEM instrument stand-alone (see the *ABEM WalkTEM User's Guide*), with the exception that the transmitter loop is connected to the ABEM TX-60 instead. The receiver antennas are still connected to the ABEM WalkTEM unit.

The ABEM WalkTEM and ABEM TX-60 units are synchronized with each other via the communication and synchronization cable.

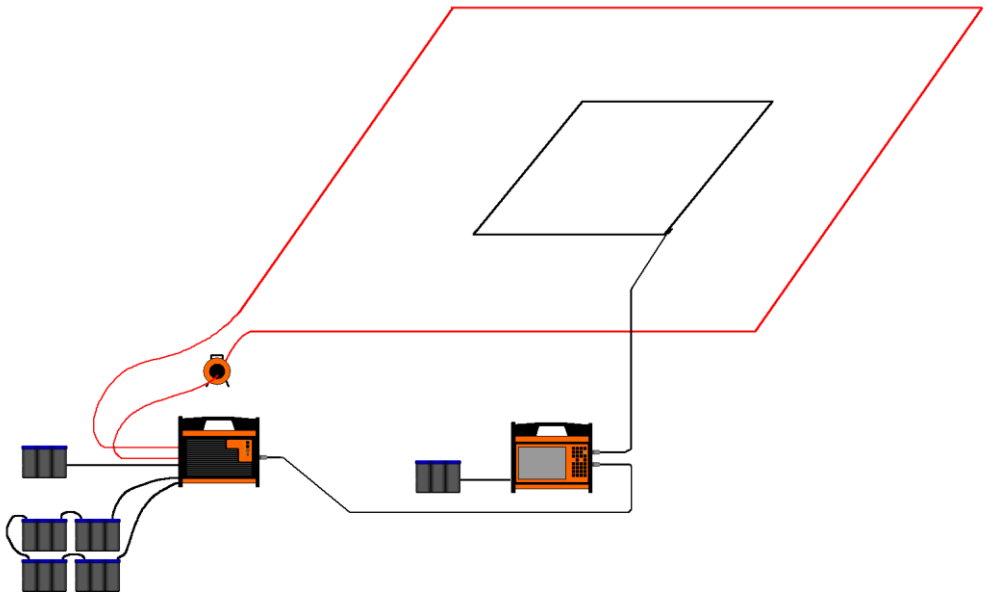


Figure 3. Field layout example with ABEM WalkTEM and ABEM TX-60. 4 external batteries are connected in serial, powering the transmitter loop with approximately 48 VDC. Both ABEM WalkTEM and ABEM TX-60 are also complemented with external batteries in order to prolong the total working time.

ABEM WalkTEM synchronization

During transmission, the ABEM TX-60 is controlled and synchronized with the ABEM WalkTEM / WalkTEM 2. This is obtained by connecting the two using a Synchronization Cable (33 8500 66).

Simply connect each end to its respective connector on the ABEM TX-60 and the ABEM WalkTEM.

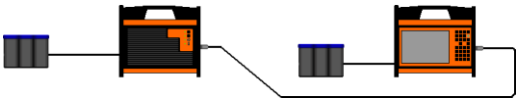


Figure 5. Syncronization cable between the ABEM TX-60 and ABEM WalkTEM.

Auxillary power

The ABEM TX-60 has a built-in battery, just like the ABEM WalkTEM, which is used for the internal logic, cooling fans etc. Although it will run for a time on the internal battery, it is recommended to add an external power source, such as a car battery, in order to prolong the survey time.

Using the External logic power cable (33 3000 42) supplied with the ABEM TX-60, it's possible to connect a car battery to the ABEM TX-60.

Note: The internal battery, nor the external logic power source, will power the transmitter loop.

Transmitter loop power

The transmitter loop has its own power input on the ABEM TX-60. The transmitter loop output current is simply adjusted by changing the input voltage from the external power source.

The external power source is most commonly an array of batteries, such as 12 VDC car batteries. By connecting two or more car batteries in serial, the ABEM TX-60 loop power input voltage can be chosen in steps of 12 VDC.

The batteries are connected in serial using the supplied battery serial interlink cables (33 8100 22) together with the ABEM TX-60 loop power cable (33 8100 21). Red connectors are used for positive (+) poles and black connectors for negative (-). The total voltage depends on the number of batteries connected in serial (their total voltage combined).

Supplied battery serial interlink cables permits up to four car batteries to be connected in serial:

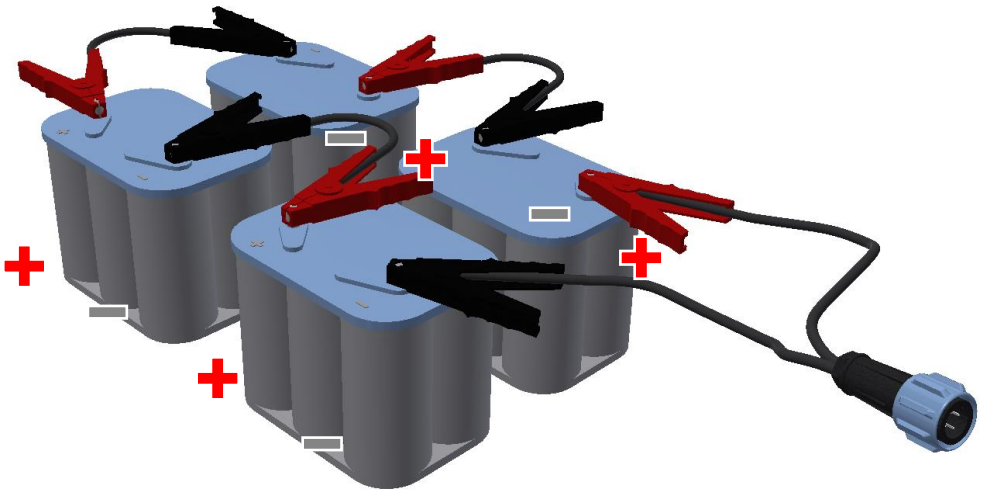


Figure 5. An array of four car batteries connected in serial, resulting in a total voltage of approximately 4 x 12 = 48 VDC. The array can be extended in order to increase the total voltage. That would require more battery serial interlink cables (33 8100 22), ordered separately.

Note: Connect the batteries in serial before connecting the cable plug to the ABEM TX-60.

Note: It is really important to use the utmost care when connecting batteries in serial. A wrong connection could result in both equipment damage as well as personal injury.

Note: Do not perform this connection if you are hesitant on how it should be done. Connections should be carried out by qualified personnel only.

Transmitter cooling

The ABEM TX-60 can generate a lot of heat when outputting high power. A heatsink and cooling fans are integrated into the rear part of the housing. In order to save energy, the fan speed is temperature controlled.

When using the equipment, it is recommended not to place it in direct sunlight as this will greatly increase the internal temperature. It is also necessary to maintain a clear passage for the fan airflow.

Note: The ABEM TX-60 should always be placed in an upright position in order not to cover the cooling air intake and exhaust.

Figure 6. Backside of ABEM TX-60 with cooling air intake at the top, indicated with blue arrows, and exhaust at the lower end, indicated with red arrows.

ABEM TX-60 operation

This section describes the buttons and indication LED's on the front panel. For a full operation procedure, see the ABEM WalkTEM User's Guide.

Built-in keypad

The ABEM WalkTEM / TX-60 measuring setup is operated from the ABEM WalkTEM user interface. It can also be operated from the ABEM TX-60 front panel to a limited extent (start and stop of measuring).

The status LED's has three colors, red, green and yellow, and can produce a flashing or solid light indication.

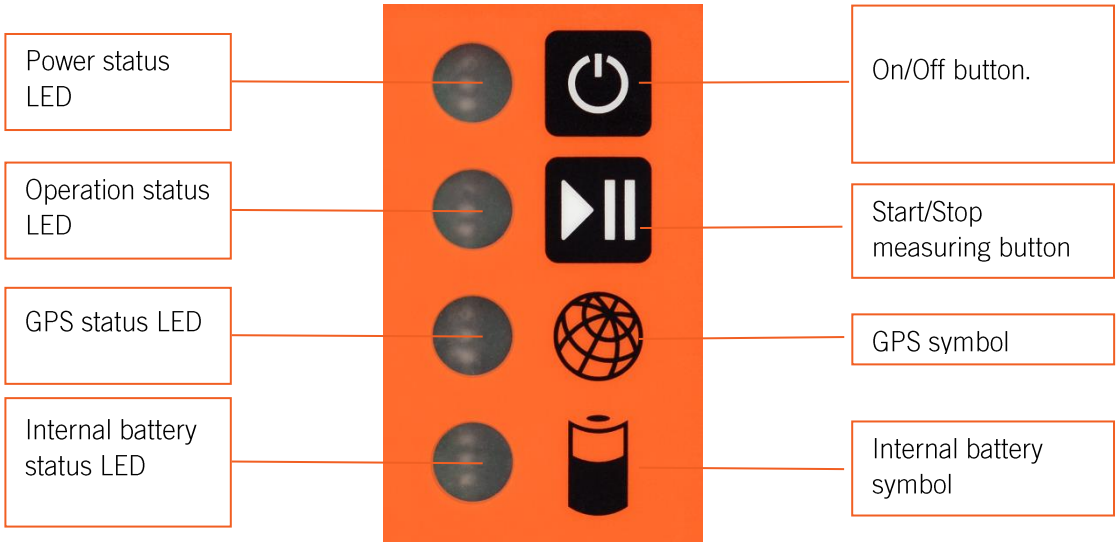


Figure 8. ABEM TX-60 keypad

Explanation of keypad functions:

On/Off button		A short press turns the instrument on. By holding the button down for 3 seconds, the instrument is turned off.
Start/Stop measuring		Can be used in order to start or stop a measurement from the ABEM TX-60. **This can also be done from the ABEM WalkTEM.**

Explanation of LED indications:

LED indicator	Status	Description
Power status LED		ABEM TX-60 is powered on
		Hardware failure
Operation status LED		Offline
		Starting up
		Online and ready to start
		Transmission in progress (ABEM TX-60 operating)
		Transmission disabled with switch on the left side of the unit
GPS status LED		No satellite fix
		GPS fix on 1 to 3 satellites
		GPS fix on 4 satellites or more
Internal battery status LED		Battery level below 33%
		Battery charging. Level below 33%
		Battery level between 33 and 66%
		Battery charging. Level between 33 and 66%
		Battery level above 66%
		Battery charging. Level above 66%

Technical specification

Transmitter

Maximum output current	60 A
Input voltage range	24 to 250 VDC
Maximum output power	5000 W
Cooling	Built-in cooling fans

General

Casing	Rugged Aluminum case meets IEC IP 66
GPS receiver	50 channels SirF star III chip
I / O ports	KPT connector for communication and synchronization with WalkTEM unit
Control power	8 Ah Internal NiMH 12 V DC power pack 10 - 34 V DC external power
Transmitter power	Connector for external transmitter loop power 24 - 250 VDC
Battery charger	Integrated for internal battery
Dimensions (W x L x H)	390 x 210 x 320 mm
Weight	14 kg
Ambient Temp Range	- 20°C to + 60°C operating[1] - 30°C to + 70°C storage[2] Note 1: Maximum 1.8 kW output power at 60°C Note 2: Noncondensing.

Field Accessories (ordered separately)

TL-1k6 Flexible transmitter coil (cord)

Effective Area	1,600 m2
Dimensions	40 x 40 meters
Conductor cross-sectional area	2.5 square mm

TL-10k High power flexible transmitter coil (cord)

Effective Area	10,000 m2
Dimensions	100 x 100 meters
Conductor cross-sectional area	6 square mm

TL-40k High power flexible transmitter coil (cord)

Effective Area	40,000 m2
Dimensions	200 x 200 meters
Conductor cross-sectional area	6 square mm

Note: Custom transmitter loops are also available on request.

Note: All specifications may change without notice as a result of ongoing product developments.