

KANTRONICS

KML-5000 TraveLog

USER MANUAL

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REVISIONS

Revision	Date	Description
0.1	2004-05-10	Preliminary
0.2	2005-09-09	Revised with smaller CCA and packaging. Added installation information

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GENERAL INFORMATION

Sales/Inquiries

Phone: 785-842-7745 (8 AM to 5 PM, Central Time, Monday through Friday)

Fax: 785-842-2031

E-mail: sales@kantronics.com

Web site: <http://www.kantronics.com>

Technical Support

Phone: 785-842-4476 (8 AM to Noon and 1 PM to 5 PM, Central Time, Monday through Friday)

Fax: 785-842-2031

E-mail: service@kantronics.com

Miscellaneous

The Kantronics Travelog is manufactured in the U.S.A.

All brands and product names are trademarks of their respective companies.

Disclaimer Notice

We have attempted to make this manual technically and typographically correct as of the date of the current issue. Production changes to the Travelog may add changes to the manual at a later date.

Send comments or suggest corrections to Kantronics Co., Inc., 1202 E. 23rd Street, Suite A, Lawrence, KS 66046, or e-mail sales@kantronics.com.

Information in this document is subject to change without notice.

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Published in the United States of America.

Important Information

READ THIS SECTION BEFORE INSTALLING THIS KANTRONICS PRODUCT

This product contains SOFTWARE in FLASH Memory, which is protected by both United States copyright law and international treaty provisions.

If you install or use this product, you are bound by the terms of the SOFTWARE license shown below. If you do not wish to be bound by such license, return the (unused) complete product package to your supplier for refund. The supplier may deduct restocking/re-packaging costs.

License Agreement

License

In consideration of payment of the License Fee, which is included in the price of the product, the Licensor Kantronics Company, Inc. (Kantronics) grants (you) a non-exclusive right to use the SOFTWARE and associated documentation. No ownership rights to the SOFTWARE or its Documentation are transferred from Kantronics to you.

Term

This License Agreement is effective until terminated. You may terminate this Agreement by returning or destroying the unit and destroying the documentation. You may not rent or lease the SOFTWARE, but you may transfer the SOFTWARE and accompanying written materials on a permanent basis provided you retain no copies and the recipient agrees to the terms of this Agreement. Kantronics may terminate this Agreement without notice if you violate any terms or conditions of the agreement. In the event of termination of the Agreement, provisions relating to Kantronics' disclaimers of warranties, limitation of liability, remedies, or damages and Kantronics' proprietary rights shall survive.

Object Code

The SOFTWARE is delivered in object code only. You shall not reverse compile or otherwise reverse engineer the SOFTWARE.

Limited Warranty

This product is covered by the standard Kantronics Company, Inc. Limited Warranty.

General

This License Agreement constitutes the complete Agreement between you and Kantronics. The SOFTWARE and/or Documentation may not be exported or re-exported in violation of any export laws or regulations of the United States of America or any other applicable jurisdiction. This Agreement shall be governed by and interpreted under the laws of the State of Kansas, United States of America. Use, duplication, or disclosure by the Government of the United States is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer SOFTWARE clause of DFARS 252.227-7013. Kantronics may in its sole discretion, provide you with upgrades of the SOFTWARE and/or Documentation if you have provided Kantronics your completed Warranty registration with a copy of your receipt showing the amount you paid.

Other

LICENSEE ACKNOWLEDGES HAVING READ AND UNDERSTOOD THIS AGREEMENT AND AGREES TO BE BOUND BY ITS TERMS. LICENSEE FURTHER AGREES THAT THIS AGREEMENT IS THE COMPLETE AND EXCLUSIVE STATEMENT OF THE AGREEMENT BETWEEN LICENSEE AND LICENSOR AND SUPERSEDES ANY PROPOSAL OR PRIOR AGREEMENT, ORAL OR WRITTEN, AND ANY OTHER COMMUNICATIONS RELATING TO THE SUBJECT MATTER OF THIS AGREEMENT.

Limited Warranty

KANTRONICS COMPANY, INC.
Effective 2003-09-01

To receive notice of future updates, or free copy of this manual, please go to <http://www.kantronics.com>.

NOTE: Return of the Warranty Registration and proof of purchase is a pre-condition to warranty coverage.

WARRANTY

Kantronics Co., Inc. ("Kantronics") warrants to the first consumer purchaser ("you"), for the Applicable Warranty Period (as described below), that the Applicable Product (as described below) will be free from defects in material and workmanship.

REMEDY

Kantronics agrees that, for any Applicable Product found by Kantronics to be in violation of the warranty within the Applicable Warranty Period, it will, at its option, repair or replace the defective Applicable Product at no charge to you, excluding in-bound shipping charges.

EXCLUSIVE REMEDY

Repair or replacement of the Applicable Product, as provided herein, is the sole remedy available to you against Kantronics, and in no event will Kantronics be responsible for any other liability or damages or for incidental, special, or consequential damages, regardless of whether purported liability is predicated upon negligence, strict tort, contract, or other products liability theory and whether or not Kantronics is warned about the possibility of such liability or damages. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

DISCLAIMER

This Limited Warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for Kantronics any other liability in connection with the sale of its products. KANTRONICS SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTY OF MERCHANTABILITY AND IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE FOR ANY APPLICABLE PRODUCT. IF, HOWEVER, YOU ARE A CONSUMER WITHIN THE MEANING OF 15 U.S.C. 2301(3), THE ABOVE DISCLAIMER OF IMPLIED WARRANTIES IS EFFECTIVE ONLY FOR PERIODS OUTSIDE THE APPLICABLE WARRANTY PERIOD. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

APPLICABLE PRODUCTS AND PERIODS

Kantronics products are of two types: (1) hardware units and (2) firmware and software for operation of these units, whether incorporated into the units themselves or separate from the units as adjuncts or accessories to the units. Hardware units and the media containing firmware, software, and documentation are sold to the consumer purchaser and become property of the purchaser. Firmware and software are licensed for use by the consumer purchaser in return for a fee included in the purchase price of the units and do not become the property of the consumer. The product to which this warranty applies (herein "Applicable Products") and the period during which the warranty shall apply (herein, "Applicable Warranty Period") are as follows: **Applicable Product: KML-5000 TravelLog.**

Applicable Warranty Period: Two (2) years from date of purchase.

EXCLUSIONS

This Limited Warranty does not apply to the cosmetic appearance of the Applicable Product; to broken or cracked cabinets; to any accessory not supplied by Kantronics which is used with the Applicable Product; to any product that has been subject to misuse, abuse, or over-voltage; to any product that has been modified by non-Kantronics personnel unless specifically authorized in writing by Kantronics; or to any product damaged or impaired by shipping (whether or not caused by poor packaging), neglect, accident, wiring not installed by Kantronics, improper parameter settings which are cleared by performing a hard reset, or use in violation of instructions furnished by Kantronics or of generally accepted industry practice. Kantronics does not warrant that the functions contained in any software will meet your requirements or achieve your intended results; or that operation of any software will be uninterrupted or error-free or without effect upon other software used with it. Responsibility for the selection of the hardware and software program to achieve your intended results rests with you.

REMEDY PROCEDURE

Should you need to make a warranty claim, first contact the dealer from whom you purchased the product. If the dealer is unable to assist you, contact Kantronics Co., Inc.:

- By mail at 1202 East 23rd Street, Suite A, Lawrence, Kansas 66046 USA
- By fax at 785-842-2031
- By phone at our Customer Support number 785-842-4476 (Hours: 8 AM to Noon and 1 PM to 5 PM, Central Time)
- Or by e-mail at service@kantronics.com.

Contact us prior to returning an Applicable Product to receive a Return Authorization Number. (As a practical matter, problems can often be solved in such a manner without the product having to be returned to Kantronics for repair or replacement.) Return of any Applicable Product for the enforcement of rights under this Limited Warranty shall be at your expense. Any product returned for warranty service, which Kantronics determines to be without defect or not covered by this Limited Warranty, shall be subject to a minimum labor charge and the product will be returned to you at your sole expense. Please note, no warranty service will be provided until Kantronics has been furnished with your Warranty Registration and copy of proof of purchase establishing purchase date.

NON-ASSIGNMENT

This Limited Warranty is not assignable by you. Any attempt to assign or transfer any of the rights, duties, or obligations hereof is void.

OTHER RIGHTS

This Limited Warranty gives you specific legal rights and you may also have other rights, which vary from jurisdiction to jurisdiction.

Return/Repair Procedures

Important: Our repair statistics show that a large percentage of units returned for service, do not, in fact, require any service. Therefore, we advise you to please double-check the following list of common, user-solvable, sources of difficulty before contacting Kantronics about returning your unit for service. An RMA (Return Merchandise Authorization) number must be requested and received, and included with the unit returned for repair. If a unit is received without an RMA number, the shipment will be denied.

Return Procedures

When calling the service department, have the following information available:

- The unit name and serial number (the serial number is found on the bottom of the unit)

Service department contact information:

Kantronics Co., Inc.
1202 E. 23rd Street, Suite A
Lawrence, KS 66046

The Service Department telephone hours are 8 AM to Noon and 1 PM to 5 PM Central Time, Monday through Friday. Telephone access to the service department is not available outside the stated hours.

Phone: 785-842-4476 (8 AM to Noon and 1 PM to 5 PM, central time)
Fax: 785-842-2031
E-mail address: service@kantronics.com
Web site: <http://www.kantronics.com>

When writing, faxing, or sending e-mail to Kantronics, include a clear description of the problem and unit name.

Be sure to include a return fax number, mailing address, and/or e-mail address.

Returns direct to the factory for refund or exchange, are strictly regulated. The sales department must approve any return for refund or exchange.

If the unit was recently purchased from one of our authorized dealers, contact that dealer first.

Repair Service Charges

Consult the limited warranty policy in this manual for the service provisions offered by Kantronics at no charge. This warranty is considered to be in force only when the customer has submitted a completed warranty registration within ten days (10 d) of purchase, and when the stipulations of the warranty have been met.

Violations of warranty clauses will automatically void the warranty, and cost of service or repairs will be charged to the owner. Service outside the warranty period will be charged at the cost of parts, labor, and return shipping, at the time of the repair or service. Units sent in for service or repair, without prior Return Authorization, will be subject to the minimum charge for labor plus cost of return shipping and handling.

Repair or DAMAGE to a unit, whether accidental or otherwise, is not covered by any warranty provided by Kantronics, in which case, normal repair charges will apply.

Contact the Service Department at:

- **785-842-4476 (hours: 8 AM to Noon and 1 PM to 5 PM Central Time)**
- **Or e-mail to service@kantronics.com**

to obtain a Return Authorization number.

Repaired units will be returned via FedEx (or UPS) C.O.D., if other payment arrangements have not already been arranged. C.O.D. charges can be avoided by providing payment information (VISA, MasterCard, or Discover) either at the time of the return authorization request, or included with the unit, when it is sent to be repaired.

PRODUCT INFORMATION

The TraveLog equipment uses a GPS receiver, microcontroller unit, Flash EEPROM, and peripheral components to log GPS location and time data and then download it to an MMC.

Note: This equipment is only for installation in a transportation vehicle including a motor vehicle.

Model Identification

<u>Model</u>	<u>Kantronics P/N</u>
KML-5000 TraveLog	001-0020-01

SPECIFICATION OF PRODUCT

Supply Voltage	+12 V dc nominal (vehicle applications)
Operating Supply Current @ 13.8 V dc	100 mA maximum
Supply Current in sleep mode (ignition off)	1.60 mA maximum
Power Connector	RIA Connect 3-pole Header
Operating Temperature	-30 to +60 °C
Humidity, maximum	95 % non-condensing
Dimensions w/o Protrusions	0.904" H X 1.690" W X 2.625" D
Weight/Mass	TBD ounces (TBD g)

CONNECTOR PINOUTS

DC Power Connector (A1J1)

Three-pole, male. Mates with three-terminal plug, P1, with screwdriver clamps for wires.

In the following table the view is looking at the rear panel with the equipment right side up.

A1J1 pin out

Terminal Nr	Physical Position	Description
1	Right terminal	Vehicle GND
2	Middle terminal	Ignition Sense (+ dc voltage)
3	Left terminal	Vehicle Power (+ dc voltage)

GPS Receiver Connector (A1W1J1)

MPX female. Mates with MPX male, which is the connector on the end of the transmission line that is part of the supplied GPS magnet mount antenna.

INSTALLATION

Dc Power and Ignition Sense

Make a power cable assembly using the supplied connector, P1. Use three wires of #22 or #24 AWG of appropriate length and color (recommend red for +12 V dc, black for vehicle ground, and a third color for the ignition sense).

A three-pole jack, A1J1, is located on the rear panel for dc power input, ignition sense input, and vehicle ground. The unit has a voltage regulator, which protects against load dump and reverse voltage transients. An external filter to reduce ignition noise transients is recommended. After-market dc noise filters are available from automotive electronics supply companies.

GPS Antenna

The GPS antenna transmission line connector, E1P1, is attached to the GPS connector, A1W1J1 that is on the rear panel.

Mounting of Unit

The unit must be mounted where the card slot can be accessed. This could be in the passenger compartment (under the dash, in a glove box, or in the console) or in the trunk area. Do not exceed the maximum operating temperature.

THEORY OF OPERATION

Because the KML-5000 TraveLog unit is small and simple there is no block diagram. Refer to the schematic diagram of the circuit card assembly for the following discussion.

Power, ground (GND), and ignition sense are connected at J1. When the ignition is off the unit goes into a sleep mode wherein only the microcontroller unit, U3, is minimally active. When the ignition of the vehicle is in the “run” position the microcontroller senses this through use of optoisolator, U1. The GPS receiver, RE1, is commanded on and GPS location data is acquired and stored in the Flash EEPROM, U2.

Downloading of the GPS data is done when an MMC is inserted into the card socket, X1.

There are three LEDs grouped together in a line on the front panel for indication of operation.

Ref Des	Position	Color	Indication
DS2	Left	Yellow	
DS1	Middle	Green	
DS3	Right	Red/Green	

SYSTEM FAULT INDICATION

Following is a table of fault indications.

“Operation Mode” column is unit in normal operation mode and “TEST Mode” column is TEST/maintenance screen mode, Pad 1 shorted to ground and then power applied.

<u>Fault</u>	<u>Operation Mode</u>	<u>TEST Mode</u>
Boot CRC	LEDs flashing to left	“Return to factory”
Flash CRC	LEDs flashing to right	“Load file”
Tech E ² CRC	LEDs flashing to right	Tech menu
Users E ² CRC	LEDs flashing to right	Tech menu

TRAVELOG INSTALLATION INSTRUCTIONS

1. Check package for

- Unit
- GPS antenna
- Power plug

2. In addition you will need

- A length of #22 AWG red
- A length of #22 AWG black
- A length of #22 AWG of a third color
- A terminal for attachment of red wire to +12 V dc constant source
- A ground lug for attachment of black wire to vehicle ground
- A terminal for attachment of third wire to +12 V dc when the ignition is on (“run” position).
- Plastic tie wraps as needed
- 2 #4 or #6 self-tapping screws

Installation

- Determine where the unit is to be mounted so the MultiMediaCard slot is accessible.
- Measure out three lengths of wire (they probably will not be of the same length) to go from their source and ground to the unit.
- Strip the three wires and attach the appropriate terminal or ground lug.
- Strip the wires at the opposite end and insert them into the proper opening in the plug (See Figure 1).

Terminal	Connection
1	Vehicle Ground
2	+12 V dc in “run”
3	+12 V dc constant

Table 1. Terminal description

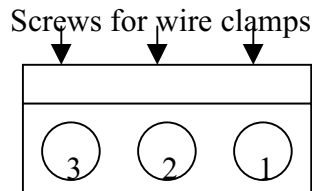


Figure 1. Backside of Plug

- Attach wires (via terminals or ground lug) to their vehicle source and vehicle ground.
- Run the wires to where the unit will be mounted. Lightly twist the wires together where possible.
- Attach the GPS magnetic mount antenna (preferably to the top of the roof for optimal GPS satellite view) and run the transmission line to the unit. Extra length of the transmission line may be lightly coiled or wrapped in figure eight. Use plastic tie wraps to hold in place.
- Install the TraveLog unit using two #4 or #6 self-tapping screws through the holes in the tabs of the unit. (Alternative mounting techniques would be to use Velcro self-adhesive strips or double-sided sticky back tape.)
- Connect the GPS antenna transmission line connector to the GPS antenna jack on the backside of the unit.
- Push the Power Plug into the Power Jack, on the backside of the unit, until you hear or feel it snap into place.

Operational Check

- Turn key in ignition switch to “run” position. The yellow LED on the left will blink in a 5 s on 5 s off pattern until the unit has acquired the GPS position. Vehicle must be outside where the GPS antenna can see the GPS satellites. Acquisition could take up to 5 min. The yellow LED will then remain off.
- When the yellow LED has extinguished, the green LED in the middle will flash on very briefly approximately every 32 s.

Download GPS Data

- To check the download capability there must be GPS information captured in the internal EEPROM.
- After about 10 min of the unit being locked on, insert an MMC, with metal pads facing down, by pushing it in the card slot and releasing.
- The dual colored LED on the right will turn red.

DO NOT REMOVE THE MMC WHILE THE LED IS RED!

- When the information has been downloaded the dual colored LED will turn from red to blinking green.
- Push in on the card and release and the card will pop out a little further. Then grasp the card and remove it.