
Technical Manual

SMART TRAC™ PS Card



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SMART TRAC PS Card

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Important Safety and Warranty Information

Warnings, Cautions and Notes



WARNING

A statement of conditions which **MUST BE OBSERVED** to prevent personal injury or death.



WARNING - ESD

A statement of conditions which must be observed to prevent damage to components due to ESD (ElectroStatic Discharge) and to prevent personal injury or death.



CAUTION

A statement of conditions which must be observed to prevent undesired equipment faults, Smart Trac AC1 system degradation and damage to equipment.

IMPORTANT

A statement of conditions which should be observed during Smart Trac AC DeviceNet setup or operation to ensure dependable service.

NOTE: Notes indicate information that is in addition to a discussion of the topic in adjoining text. Alternatively, it may limit or restrict the paragraph(s) that follow(s) to specific models or conditions.

TIP - Tips indicate information that should make a procedure easier or more efficient.

General Safety Precautions - Warnings

Important safety information follows. Please *read and understand* all precautions listed below before proceeding with the specification, installation, set-up or operation of your Smart Trac AC1. Failure to follow any of the following precautions may result in personal injury or death, or damage to the equipment.



WARNING - ESD

The Control Printed Circuit Board (PCB) employs CMOS Integrated Circuits that are easily damaged by static electricity. Use proper ElectroStatic Discharge (ESD) procedures when handling the Control PCB. See Smart Trac AC1 Technical Manual for details. Failure to comply may result in damage to equipment and/or personal injury.

Important Warranty Information.

Do not modify your Smart Trac AC1, its components, or any of the procedures contained in the technical documentation supplied by MagneTek. Any modification of this product by the user is not the responsibility of MagneTek and will void the warranty.

Smart Trac PS Card

General Capabilities

The Smart Trac PS (Power Supply) card supplies power to the Smart Trac CPU card and all of the Smart Trac option cards. The Smart Trac PS card requires input power as a single phase voltage from 90 to 264 VAC. The output power is +5 VDC at 2000 mA, -5 VDC at 200mA, +12 VDC at 1000 mA, and -12 VDC at 300mA. The power is output through a PC/104 connector. The card complies with the PC/104 Specification, Version 2.1.

Specifications

Smart Trac PS Card Specifications	
Input Voltage	90-264 VAC
Output voltage	+5 V @ 2A -5 V @ 0.2 A +12 V @ 1 A -12 V @ 0.3A
Input frequency	47-63 Hz
Inrush current (cold)	20A @ 110 VAC 40A @ 220 VAC
Operation temperature	0° C -50° C
Storage temperature	-20° C -80° C
Relative humidity	0 - 90%, non-condensing

Smart Trac PS Card Output Specifications							
O/P Volts	Load Current		Ripple Noise	Line	Load	Efficiency	OVP Trip Point
	Min	Max					
+5 V \pm 10%	0.4A	2A	50 mV _{p.p.}	\pm 1%	\pm 2%	72% min.	5.6-6.0V
-5 V \pm 10%	0A	0.2A	50 mV _{p.p.}	\pm 1%	\pm 10%		
+12 V \pm 10%	0A	1A	120 mV _{p.p.}	\pm 1%	\pm 5%		
-12 V \pm 10%	0A	0.3A	120 mV _{p.p.}	\pm 1%	\pm 10%		

Quick Start

1. Remove all Smart Trac cards except the Smart Trac Inverter, CPU and PG cards per instructions in “Installing the Smart Trac PS Card.”
2. Install the Smart Trac PS card as the fourth card of the card stack.
3. Make connections to the Smart Trac PS card connector CN1 per information contained in this manual and your situation. (Connector CN4 is not used except for testing).
4. Replace all other cards on top of the Smart Trac PS card per the instructions in the “Installing the Smart Trac PS Card.”
5. Power up and test functionality of your Smart Trac AC1, including that of the Smart Trac PS card

Installing the Smart Trac PS Card

Unpacking

Electrostatic Discharge (ESD) Procedures



WARNING - ESD

Keep electronic circuit boards in Electrostatic Discharge (ESD) protective bags when not being handled. Use proper ESD procedures (including an ESD wrist strap) when handling circuit boards. Failure to comply may result in damage to equipment.

When working with an electrostatic discharge (ESD) sensitive device, you should be grounded at all times. The easiest and most common way to provide this ground is to use an approved ESD wrist strap. The strap is secured to your wrist with a wire attached to the strap and clipped or taped to the chassis of the unit being worked on. Any static is dissipated through the wire to ground, greatly reducing the possibility of damage to the device.

It is a good idea to touch the chassis with your finger before handling any electrostatic sensitive device. Any static electricity will be discharged to chassis ground and will not be transferred to the device.

Always store devices (cards, other electronic components) in ESD protective bags when not being handled.

Unpacking Procedure

Remove the protective shipping and packing material from the card. Ensure contact wedges and other shipping devices have been removed.

Installing the Smart Trac PS Card

The Smart Trac PS Card must be positioned above the Smart Trac PG Card on the Smart Trac AC1 card stack.

NOTE: If replacing a Smart Trac PS card to an existing Smart Trac card stack, see "Appendix C – Removing the Smart Trac Card Stack" before continuing.

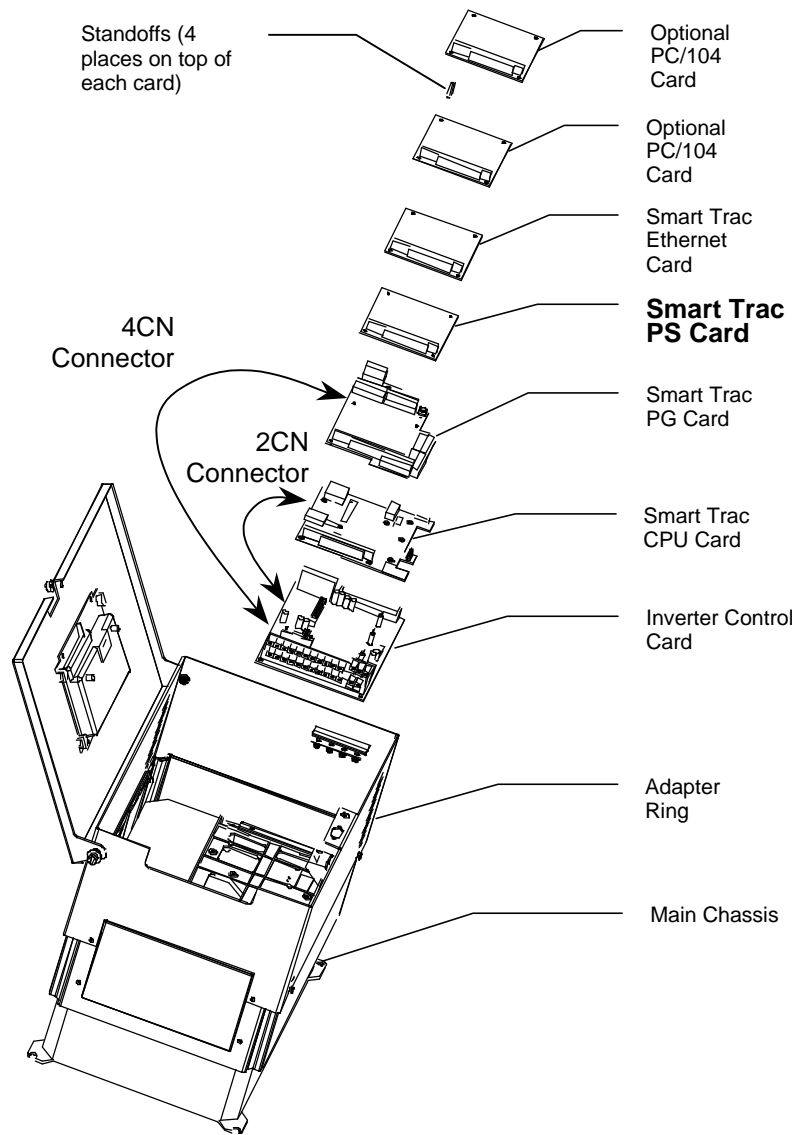


Figure 1. Smart Trac PS Card Stack Position

1. Orient the Smart Trac PS card above the Smart Trac PG card so that PC/104 connector pins on the Smart Trac PS card align with the receptacle on the Smart Trac PG card. Exercise care in handling so the pins don't bend when the card is pushed into place
2. Gently but firmly push the Smart Trac PS card down to mate with the Smart Trac PG card, making sure that you keep pins in proper alignment. Secure the card using four (4) metal standoffs.
3. Replace the Smart Trac PG Card and other cards by reversing the instructions in "Appendix C – Removing the Smart Trac Card Stack".

Making Connections

Connectors

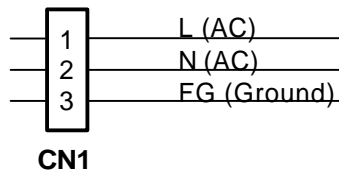
The Smart Trac PS card has three connectors: PC/104 Connector (mates with PC/104 connector on Smart Trac PG card), AC Input Connector CN1 and DC Output Connector CN4. *The DC Output Connector CN4 is not used.* See “Smart Trac PS Card Layout” for location of connectors.

PC/104 Connector

The PC/104 Connector is a “stack-through” connector. Gold pins on the Smart Trac PS Card mate with a PC/104 receptacle on the Smart Trac PG card. The PC/104 connector on the Smart Trac PS card also accepts PC/104 pins from the Smart Trac Ethernet card normally placed on top, to mate with it.

AC Input Connector CN1

The AC input connector has three pins for AC Input (L=Line, N=Neutral, FG=Ground).



Smart Trac PS Card Layout

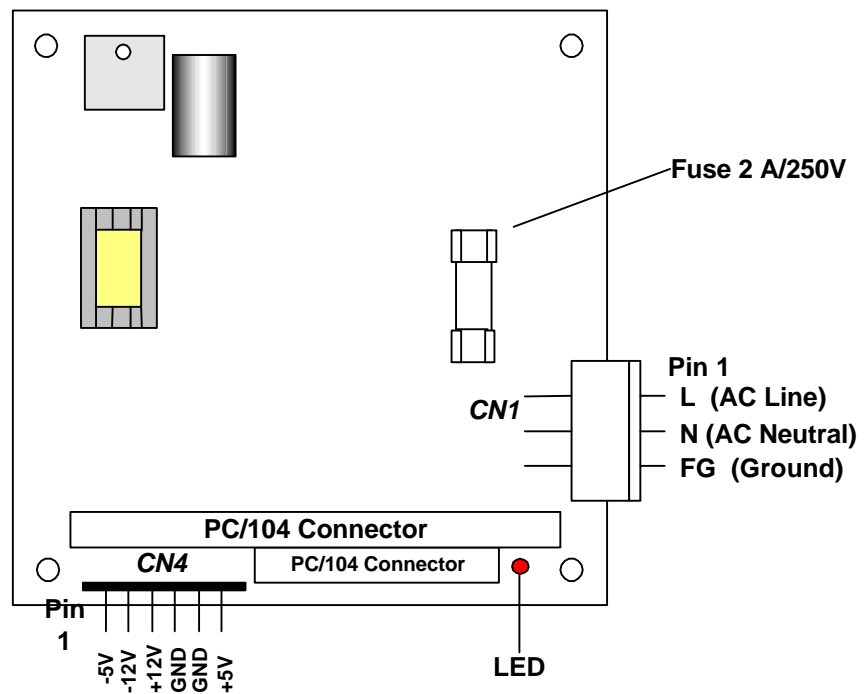


Figure 2. Smart Trac PS card layout.

NOTE: CN4 is not to be used for powering external devices. The pins are provided as test points only!

Testing Card Installation

On-board Indicator Light (LED)

When illuminated, a red LED (light emitting diode) on the power supply card indicates that power is being supplied to the card (see "Figure 2"). During normal operation, this light should be ON.

Checking Input Power

To check the voltage of power to the Smart Trac PS card:



WARNING

Take proper precautions when making the following system checks. Hazardous voltages and amperage are present. The front door of the Smart Trac AC1 must be open and power applied to the unit while testing. Electrical shock or damage to the equipment may result if precautions are not taken while testing the power supply. Failure to comply may result in personal injury or death.

1. Connect one lead of a Digital Voltmeter or Digital Multimeter to AC Line pin L of CN1. Connect the other to pin N of CN1.
2. Read the AC Line voltage and record. It should be +90 to 264 VAC, depending on the source of power to it.

Checking the Power Supply Output

1. Tag the Smart Trac AC1 "Out of Service."



WARNING

Take proper precautions when making the following system checks. Hazardous voltages and amperage are present. The front door of the Smart Trac AC1 must be open and power applied to the unit while testing. Electrical shock or damage to the equipment may result if precautions are not taken while testing the power supply. Failure to comply may result in personal injury or death.

2. Open the door to the Smart Trac AC1. Do not touch components inside unit.
3. Connect one lead of a digital multimeter to the common on the CN4 connector and the other lead to either +5V or +12V pins.
4. Read the multimeter. The +5V pin should read +4.5 volts to +5.5 volts. The +12V pin should read +10.8 volts to +13.2 volts. If out of range, replace the Smart Trac PS card.

NOTE: Negative pin (-5V or -12V) readings depend on your specific Smart Trac AC1 system configuration and will typically deviate considerably (more negative) from their -5V or -12V labels. Only the positive pins will give consistent results system-to-system.

5. Close the door to the Smart Trac AC1.
6. Remove "Out of Service" tags.
7. Test operation of Smart Trac AC1.

Appendix A - Maintenance and Replaceable Parts List

Maintenance

A 2 amp, 250 volt fast type fuse protects your Smart Trac PS card. It may be replaced as required. For location, see Figure 2.

Replaceable Parts List

The only replaceable part on the Smart Trac PS card is listed below. See the Smart Trac AC1 Technical Manual for other replacement parts, optional parts and tools, ordering contacts and procedures.

Description	MagneTek Part Number	Qty
Smart Trac PS Card	46S03554-0030	1
Technical Manual – Smart Trac PS Card	TM 3554-0030	1
Fuse, 2 amp, 250 volt, fast type		1 req'd
Standoff, 4.5mm, Hex, Stl, CL ZINC, 15mm, M/F, M3, M3	05P00618-0006	4 each PS assy.
Card Extraction Tool	(Parvus Corporation P/N PRV-0760A-01)	Option
Tools Kit	TBD	Option

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Appendix B - Technical Support

Getting Help

Should you need technical assistance with installation or troubleshooting of your Smart Trac AC1, you can phone our Help Desk at either (800)-541-0939 or (262)-782-0200. *Alternatively, you may copy the **Problem Report** form, found on the next page, and fax it to us at (262)-782-3418.*

References

MagneTek Drives and Systems

For more information about MagneTek drives and systems, training programs and contacts, visit:

<http://www.magnetekdrives.com>

PC/104 Specification, Version 2.1

PC/104 Consortium. An overview and the specification may be obtained at the web site address:

<http://www.controlled.com/pc104/index.html>



Problem Report

Name:

Address:

City:

State:

Zip

Serial Number:

Power Supply Card

Occurrence: Frequently Intermittantly Rarely

Nature of Problem:

Conditions when problem occurs:

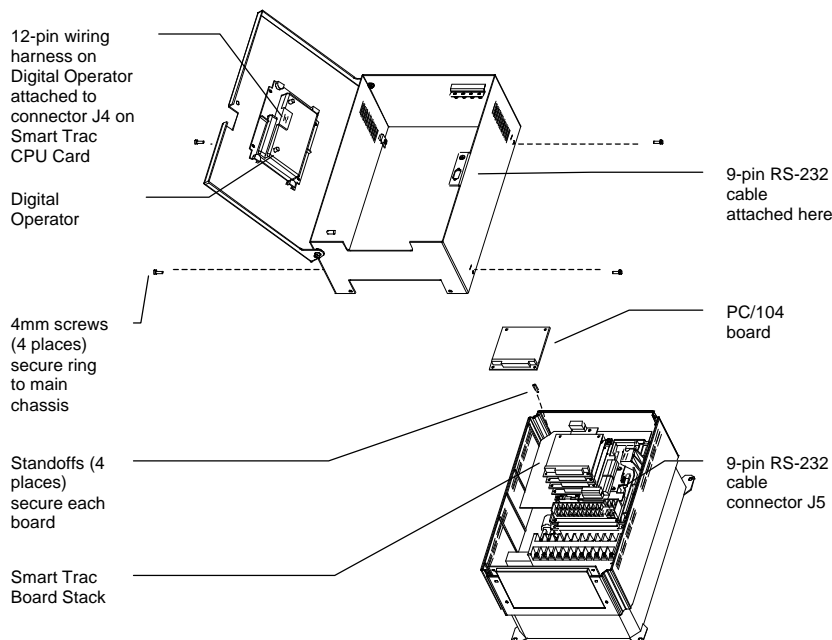
Appendix C – Removing the Smart Trac Card Stack

General Procedures

1. Power off the Smart Trac AC1. Disconnect it and tag "Out of Service".
2. Do one of the following:
 - Open the cover to the Smart Trac AC1 by rotating the spring-loaded, captive screw counterclockwise. Use a large screwdriver if necessary to free the slotted screw.

OR

- Loosen the screws holding down the cover.
3. Disconnect the 12-pin wiring harness from connector J4 at the digital operator.
 4. Using the Phillips head screwdriver, remove the ground strap from the left inside and the ground strap from the top inside of the Smart Trac AC1 adapter ring.
 5. Disconnect the 9-pin RS-232 cable at connector J5 on the Smart Trac CPU card.



6. Using a 4.5mm hex head driver, remove four standoffs from the topmost card.
7. Using the PC/104 extraction tool, remove the topmost card from the stack.

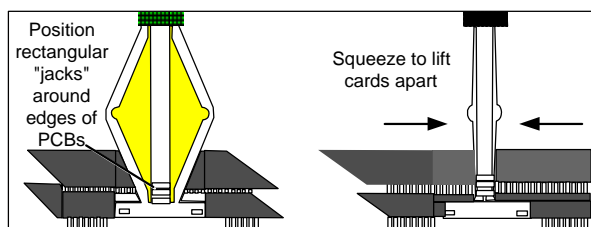


Figure 3. Using the PC/104 Extraction Tool.

8. Repeat step 8 above until all PC/104 cards have been removed.
9. To remove the Smart Trac PG card:
 - Disconnect the 4CN connector on the PG card.
 - Using a tubular extraction tool or pliers, squeeze the plastic, spring-loaded retainer built-in to the long plastic standoff located at the top of the PG card, just above connector J6.
 - Using a PC/104 extraction tool, remove the card.

NOTE: The Smart Trac PG card requires unique handling. Wedge the extracting tool between the PG card and the CPU card. The area between the terminal strip on the CPU card and the serial numbered edge of the PG card can be lifted first, then the opposite side (nearest TB1) on the PG card). Alternate sides until the card is free of the CPU card.

10. To remove the Smart Trac CPU card:

- Disconnect the card at the 2CN connector on the CPU card.
- The CPU card is secured with three plastic standoffs with spring-loaded clips on the end. Squeeze the top of the standoffs (the clips) with the special cylindrical removal tool, your fingers or needle-nosed pliers and lift the CPU card from the Smart Trac Inverter Control Card.

You have removed the entire card stack. The inverter card, considered part of the drive, is in clear view.

Glossary of Terms

Ethernet	The most common type of corporate network, ethernet is an open network standard (per Ethernet 802.3). It was developed jointly by Intel, Digital (now Compaq) and Xerox). An Ethernet card is standard in a Smart Trac AC1.
PC/104	An embedded PC bus standard. The standard defines the mechanical size of a self-stacking bus. Also an IEEE draft standard, called the P996.1 Standard for Compact Embedded PC Modules, the PC/104 Specification, Version 2.1, July 1994, PC/104 Consortium.
stack-through	Used to describe a connector with pins on one side of a printed circuit board and a receptacle for pins on the other side. With such a connector, one board may be mated electrically to another board, yet be layered, one on top of another, as part of a board stack.

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SMART TRAC PS Card

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