
Technical Manual

SMART TRAC™ *LAN Card*

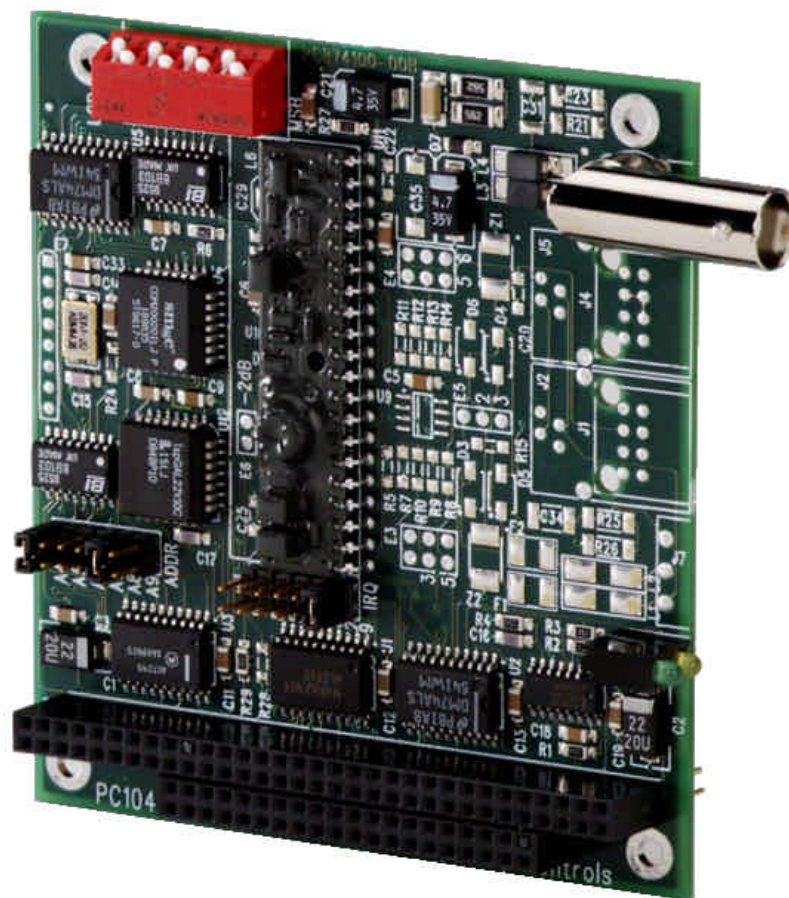


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Important Safety and Warranty Information

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 LAN

General Capabilities

The SMART TRAC LAN allows programs written with Smart Trac Workstation to communicate with other devices (drives, PLC Gateways, remote displays, remote I/O, and IBM compatible personal computers) on a Smart Trac LAN. This provides compatibility with previous generations of MagneTek DSD drives and related products. Using a proprietary MagneTek protocol, the Smart Trac LAN communicates information onto an ARCNET LAN.

ARCNET is a token-passing LAN that can communicate to 2.5 Mbps. Up to 255 nodes in a coaxial bus network can be addressed to communicate to a distance of about 4 miles using active hubs. Smart Trac LAN will support more than 90 networked drives.

The proprietary MagneTek protocol provides a means for drives on the network to remain in sync, allows for zero drift between sections, allows communication of digital and numeric data, and allows for program upload and downloads. The board complies with the PC/104 specification version 2.2 dated July 1994.

Card Requirements

The Smart Trac LAN card requires:

- one open PC/104 spot (one of the top two positions) in the Smart Trac AC 1 stack.
- a Smart Trac AC 1 running under Windows NT 4.0, Service Pack 4 or higher and Smart Trac Workstation.

Software

The Smart Trac LAN card ships with the Smart Trac LAN I/O driver pre-installed. The driver has been installed according to the instructions in the *Smart Trac LAN I/O Engineer's Guide*.

Messaging

Your Smart Trac LAN card will transmit two types of messages: *broadcast* and *directed messages*.

Broadcast Messages

All nodes enabled to receive broadcast messages receive them. Drives generate broadcast messages after the power-up initialization sequence. Such messages

include speed references, drive logic status, and synchronizing timing information.

Directed Messages

Only one node receives a directed message, the one node addressed in the message. Directed messages include numeric input and output values, logic input and output states, display data, initial configurations and allocations between drives and other remote nodes.

Drive Coordination

The Smart Trac LAN I/O driver determines one drive on the network, called the *Sync Master*, to broadcast synchronization messages to the other drives. All drives receive each sync message simultaneously and update their clocks using the information contained in the message.

Installing the Smart Trac LAN 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) 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 LAN Card

The Smart Trac LAN Card is PC/104 compatible, so it may be positioned in one of the top two positions (PC/104 Option Card positions) of the Smart Trac card stack.

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

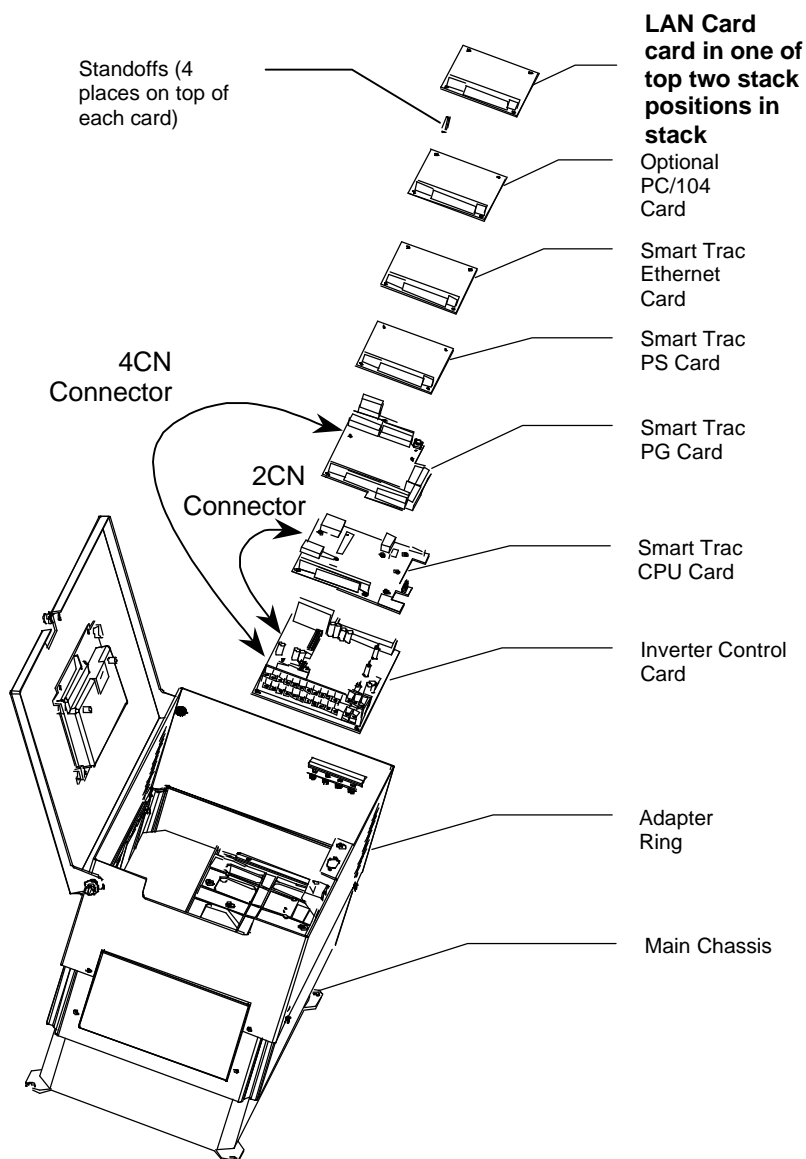


Figure 1. Smart Trac LAN Card Stack Position

1. To install the LAN card, orient the pins on the card with the female pin connector on the card below it (normally the Ethernet card or a PC/104 option card). Gently but firmly push the Smart Trac LAN card onto the card below it. Make sure connecting pins are in alignment before pushing the two boards tightly together. Secure the card using four (4) metal standoffs.
2. Replace all other cards, securing each with four (4) metal standoffs and the reverse of steps in "Appendix D – Removing the Smart Trac Card Stack".

Connecting the Smart Trac LAN Card to the Network

Coaxial Cabling

Use RG-62/u coaxial cable to network your Smart Trac LAN. Connect each Smart Trac LAN card to the network using the BNC mating connector on each board.

NOTE: There must be a cable length of at least 6 feet between nodes. Failure to adhere to this minimum may result in unreliable operation.

- Maintain a minimum of 6 feet of cable between nodes.
- The minimum bend radius of the cable is 3 inches.
- Limit the number of nodes per cable segment to eight (8).
- Terminate both ends of a cable segment with either a 93-ohm termination resistor or an active hub port connection.

Hubs

Devices that receive a signal and then transmit it to connected devices are called *hubs*. Hubs may be either active or passive types.

Passive Hubs

Passive hubs cannot be used with Smart Trac LAN.

Active Hubs

An active hub regenerates the network signal to permit greater distances between nodes or increase the number of nodes allowed to more than eight (8). By providing isolation and guarding against cable faults and reflections, active hubs maintain the integrity of data being transmitted.

- Using active hubs, segments may be 1000 feet (305 meters) in length.
- The length of cable between two active hubs cannot exceed 2000 feet (710 meters).
- As many as 10 active hubs can be cascaded, providing an overall cable length of 22,000 feet (7810 meters).

Configuring the Smart Trac LAN Card

Configuration

You configure the Smart Trac LAN card by either accepting default values or changing them to suit your unique situation. The values chosen at installation of the Smart Trac LAN I/O driver must match those of the card.

Default Settings

The Smart Trac LAN Card is shipped from the factory already configured for the typical installation. The default values are:

- **Base I/O Address:** 0X02e0 (jumpers at E2 on pin locations 4 and 8).
- **Interrupt:** 2/9 (jumper at E1 on pin location 2).
- **Switch SW1:** (no default). You must set this switch for your own situation. Position 1 is the Most Significant Bit and 8 the Least Significant Bit. If positions 5 and 7 are down as shown in Figure 4, this setting represents a Node ID of hexadecimal address F5.

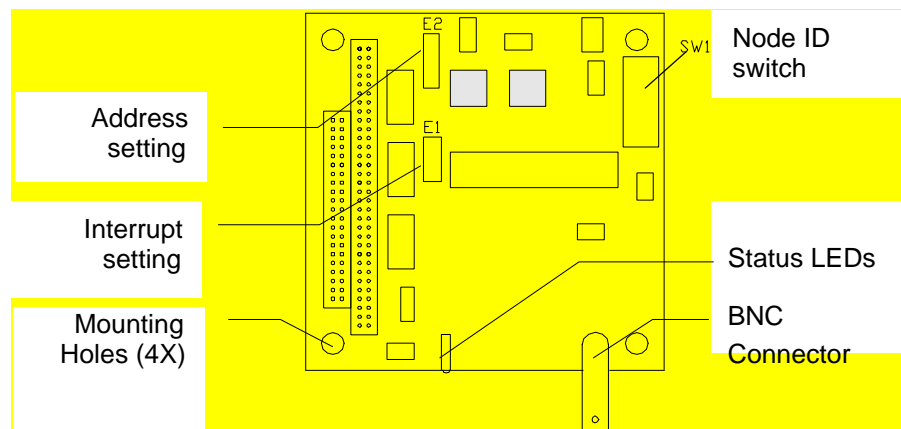


Figure 2. The Smart Trac LAN card.

Factory (default) settings for all Smart Trac cards are indicated in the following table:

Table 1. Smart Trac AC 1 System Default Interrupts and Addresses

Card	Interrupt	Base I/O Address	Comments
Smart Trac CPU card, local operator port	3	0x2F8	
Smart Trac CPU card, serial port at COM1	4	0x3F8	
Smart Trac Ethernet card	5	0x320	
Smart Trac LAN card	2/9	0x2e0	
Smart Trac internal Heartbeat	2/10	---	

Changing IRQ and Address Settings

You may change the Interrupt Request (IRQ) value using jumpers at Smart Trac LAN card location E1. You may change the Address using jumpers at location E2. The jumpers complete the electrical connection across the pair of pins corresponding to each location (E1 or E2) and value.

Changing the IRQ

IRQ values may be set to 2/9 (default), 3, 4, 5 or 7 by moving the jumper across the corresponding pair of pins at location E1. However, the factory default setting (shown in Figure 3) should be suitable for most applications.

NOTE: In nearly all circumstances, you should accept a default base address of 0x2e0 and an interrupt of 2/9. Using a different base address and/or interrupt may result in system problems. Consult with your MagneTek Application Engineer if your PC environment requires settings other than the default values.

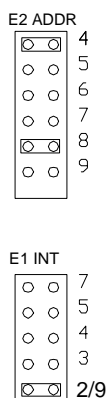


Figure 3. Card locations E1 (Interrupt) and E2 (Address) with default jumpers installed.

Changing the Address

An address is represented as "0x0Hh0", where the letters "Hh" indicate two hexadecimal values for most significant (H) and least significant (h) digits that may be set. The most significant digit (H) can be 0, 1, 2 or 3. The least

significant (h) digit can be from hexadecimal "0" through hexadecimal "F". The addresses may be from 0x0000 to 0x03E0. The default value is 0x0300.

You may change the memory address using jumpers at location E2. Table 2 indicates the jumper settings for various Base I/O Addresses. A "1" indicates locations where a jumper must be installed for the corresponding hex address number. Likewise, "0" indicates the locations where jumpers are not installed to assign a specific I/O address to the card. Address positions A8 and A9 determine the most significant (H) value of the address. Likewise, address positions A4 through A7 determine the least significant (h) value of the address. The bold and shaded values indicate jumper positions for the default address 0x02e0.

Table 2. Jumper settings for I/O Base Addresses

I/O Base Address Jumper Settings (1=Jumper Installed)						
I/O Addr	Addr 9	Addr 8	Addr 7	Addr 6	Addr 5	Addr 4
100	1	0	1	1	1	1
110	1	0	1	1	1	0
120	1	0	1	1	0	1
130	1	0	1	1	0	0
140	1	0	1	0	1	1
150	1	0	1	0	1	0
160	1	0	1	0	0	0
170	1	0	1	0	0	0
180	1	0	0	1	1	1
190	1	0	0	1	1	0
1A0	1	0	0	1	0	1
1B0	1	0	0	1	0	0
1C0	1	0	0	0	1	1
1D0	1	0	0	0	1	0
1E0	1	0	0	0	0	1
1F0	1	0	0	0	0	0
200	0	1	1	1	1	1
210	0	1	1	1	1	0
220	0	1	1	1	0	1
230	0	1	1	1	0	0
240	0	1	1	0	1	1
250	0	1	1	0	1	0
260	0	1	1	0	0	1
270	0	1	1	0	0	0

I/O Base Address Jumper Settings (1=Jumper Installed)						
I/O Addr	Addr 9	Addr 8	Addr 7	Addr 6	Addr 5	Addr 4
280	0	1	0	1	1	1
290	0	1	0	1	1	0
2A0	0	1	0	1	0	1
2B0	0	1	0	1	0	0
2C0	0	1	0	0	1	1
2D0	0	1	0	0	1	0
2E0	0	1	0	0	0	1
2F0	0	1	0	0	0	0
300	0	0	1	1	1	1
310	0	0	1	1	1	0
320	0	0	1	1	0	1
330	0	0	1	1	0	0
340	0	0	1	0	1	1
350	0	0	1	0	1	0
360	0	0	1	0	0	1
370	0	0	1	0	0	0
380	0	0	0	1	1	1
390	0	0	0	1	1	0
3A0	0	0	0	1	0	1
3B0	0	0	0	1	0	0
3C0	0	0	0	0	1	1
3D0	0	0	0	0	1	0
3E0	0	0	0	0	0	1
3F0	0	0	0	0	0	0

Setting Node ID Switch (SW1)

An eight-bit DIP switch (SW1), located near the board edge, provides the ability to set the node ID of the card on the LAN. Possible node IDs range from 1 to 255 (Node 0 is reserved for broadcast message transmissions across the network). These decimal numbers are converted to hexadecimal numbers for easier communication. For example, node ID 223 is hexadecimal number DF. The default node ID of F5 represents decimal node ID 245.

NOTE: You may assign any valid node ID (1-255) to any Smart Trac LAN card as long as it is not the same as a node ID assigned to any other Smart Trac LAN card. Each node ID must be unique to the network. You might want to maintain a list of assigned node IDs and the associated Smart Trac AC 1 and/or label each Smart Trac AC 1 with its assigned node ID.

When the LAN is first activated, each Smart Trac AC 1 equipped with the LAN card broadcasts this unique node ID across the LAN. As each new Smart Trac joins the network, a reconfiguration burst is sent, resulting in a reinitialization sequence. For details, see the "Smart Trac LAN I/O Driver Engineer's Guide."

DIP switch settings for the node ID can be changed with power applied to the card. However, the new node ID will not take effect until power is cycled.

DIP switch SW1 may be set to the node ID in binary format. The most significant bit (MSB) is switch position 1. The least significant bit (LSB) is switch position 8. A switch in the "open" position (off position, or position furthest away from the printed circuit board) introduces a logic "1."

For example, the default node ID of 245, or F5 hexadecimal, is converted to binary 11110101.

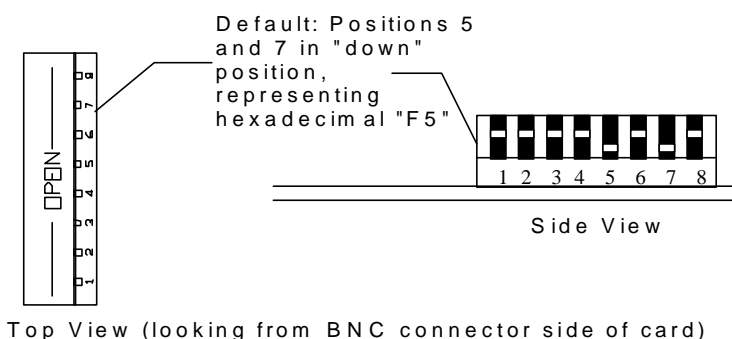


Figure 4. Smart Trac LAN card DIP switch SW1 settings

Tip:

Maintain an accurate record of Smart Trac node ID assignments. Mark the back of each card or place a small sticker on the back indicating the node ID for that particular LAN card.

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Testing the Installation

On-board Indicator Lights

Two LED indicator lights on the Smart Trac LAN card provide network-related information:

- A green LED that is flashing indicates that the card has been initialized and is receiving ARCNET traffic from the network.
- The yellow LED that is flashing indicates that the card is being accessed by its I/O address.



Figure 5. LED Indicator Lights (card viewed with component side up)

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Troubleshooting Your Smart Trac LAN Card

Intermittent problems

If network problems surface only intermittently, the problem may be caused by setting duplicate addresses. In other words, one card has the same address as another one. This may result in a reconfiguration occurring at an inappropriate time.

Because node ID addresses are set manually, it is easy to assign the same address to more than one card.

Wrong cable or segment too long

Make sure the correct cable type (RG-62/u) has been installed.

Maximum segment length is 1000 feet.

No more than eight Smart Trac LAN cards are allowed per segment without an active hub.

Improper termination

BNC style 93 (nominal) ohm terminators (see Part's List) must be installed on each end of a bus segment or unused active hub port.

Improper IRQ

Check Windows NT hardware resources. Ensure that no conflict exists. Generally, the default of 2/9 should be accepted.

Reconfiguration at inappropriate time

Check for more than one node with the same ID. Remove the conflict by assigning one of the nodes a new ID.

Check for improper termination.

Check for bad cable in network.

Check for improperly grounded equipment.

Smart Trac LAN Card Faults

Faults specific to your Smart Trac LAN card are listed in the following table. The Smart Trac AC 1 displays these faults as they occur. For more information on Smart Trac AC 1 faults in general, consult the *Smart Trac AC 1 Technical Manual* or *Smart Trac AC 1 Engineer's Guide*.

Smart Trac LAN Card Faults, Corrective Action, Entered and Displayed Values				
Fault	Probable Cause	Corrective Action	Fault Code (entered decimal equivalent)	Control Node Monitor Displayed Fault (hexadecimal)
LAN Hardware Fault	Smart Trac LAN card is not responding properly. On power-up, if the LAN does not initialize properly, normally a hardware error is indicated.	Check BNC Tee connector Check 93-ohm termination resistor. Replace drive control card.	85736	0x00014EE8
LAN, Maximum # Transmit Attempts Exceeded	The Smart Trac LAN card has made three unsuccessful attempts to transmit a directed message. The message was terminated.	Verify that given node number is connected to the same coaxial cable as the Smart Trac AC 1 Verify Smart Trac AC 1 is operational.	85737	0x00014EE9
LAN, Illegal Message Type Received	The Smart Trac LAN card received a message that it cannot interpret. The message content is not one of the supported data types and is ignored.	Verify that given node number is operating properly. Verify the LAN operating properly. Verify that the function causing the Fault is supported in Smart Trac AC 1's software. Software in Smart Trac AC 1 may need updating.	85738	0x00014EEA

Smart Trac LAN Card Faults, Corrective Action, Entered and Displayed Values				
Fault	Probable Cause	Corrective Action	Fault Code (entered decimal equivalent)	Control Node Monitor Displayed Fault (hexadecimal)
LAN Broadcast Message Missed	The Smart Trac LAN card did not receive an expected broadcast message within the last one second. A broadcast message has been lost. Reaction of drive depends on the application program.	Verify that given node number is connected to the same coaxial cable as this Smart Trac AC 1. Verify that Smart Trac AC 1 is operational	85739	0x00014EEB
LAN Directed Message Missed	The Smart Trac LAN card did not receive an expected directed message within the last 10 seconds. This may not be an immediate problem. Reaction of drive depends on the application program.	Verify given node number is connected to same coaxial cable as Smart Trac AC 1. Verify Smart Trac AC 1 is operational.	85740	0x00014EEC
LAN, No Room to Transmit Message	The Smart Trac LAN card has run out of memory to place a response message for transmission. The response request will be lost.	Usually caused by aborting a display request just before making a new display request. May also result from a hardware failure.	85741	0x00014EED
LAN, No Room to Receive Message	The Smart Trac LAN card has run out of memory to place a received message for future processing. The received message will be lost.	Usually indicates that LAN traffic exceeds the capability of the Smart Trac AC 1's LAN software.	85742	0x00014EEE

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Appendix A - Specifications

Smart Trac LAN Card Specifications

Characteristic	Specification
Operating Temperature	0° C to 60° C
Storage Temperature	40° C to 85° C
Baud Rates Supported	2.5Mbps, 1.25 Mbps, 625 Kbps, 312.5 Kbps, 156.5 Kbps
Interrupts	Supports strapping of IRQ 2/9, 3, 4, 5 and 7
Compatibility	PC/104 Specification 2.2 dated July 1994
Power Requirements	+5V, 200mA; -12V, 50mA
Type of Network Supported	Coaxial bus
Cable Supported	RG-62/u with BNC connectors
Cable length	Min: 6 ft (2m ¹) Max: 1000 ft (305m) 5.5 dB/1000 ft. maximum
Maximum Nodes Bus Segment	8 nodes
Card Dimensions	3.550" x 3.775"
Shipping weight	1 lb.

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Appendix B - Technical Support

Getting Help

Should you need technical assistance with installation or troubleshooting of your Smart Trac LAN, you can telephone 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.

Name:

Address:

Occurrence: ☐ Frequently ☐ Intermittently ☐ Rarely

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References

The following publications may be of help to you. Some are referenced within this manual. Others are listed as important supporting information.

*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>

*ARCNET Local Area
Network Standard: Token
Bus (2.5 MBPS)*

ATA/ANSI 878.1, ARCNET Trade Association, 1992. Information about ARCNET and the standard may be obtained at the web site:

<http://www.arcnet.com>

*Smart Trac AC 1
Engineer's Guide*

Provides information needed to design, install and configure a Smart Trac AC 1. Ask for publication TM-7200, available from MagneTek, Inc., Publications Dept., 16555 West Ryerson Road, New Berlin, WI 53151, phone 800-541-0939 or contact the MagneTek Drives website at:

<http://www.magnetekdrives.com>

*Smart Trac AC1 Technical
Manual TM 7210*

Provides information needed to install a Smart Trac AC 1. Ask for publication TM-7200, available from MagneTek, Inc., Publications Dept., 16555 West Ryerson Road, New Berlin, WI 53151, phone 800-541-0939 or contact the MagneTek Drives website at:

<http://www.magnetekdrives.com>

*Smart Trac LAN I/O
Driver Engineer's Guide*

Provides information needed to install and configure the software driver required to run the Smart Trac LAN. Ask for publication TM-72XX, available from MagneTek, Inc., Publications Dept., 16555 West Ryerson Road, New Berlin, WI 53151, phone 800-541-0939 or contact the MagneTek Drives website at:

<http://www.magnetekdrives.com>

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Training



MagneTek holds Training Seminars at its Training Facility in New Berlin, WI. The facility includes training rooms with individual desktop computers and videoconferencing capabilities, a drive demonstration room displaying MagneTek's drives, and an on-site company lunchroom. Mail or fax the form below to obtain information on scheduled dates of Training Seminars for the Smart Trac AC 1.

Should you have questions about training, or need information quickly, you may contact the Help Desk at (800) 541-0939 or (262) 782-0200.

Training Seminar Information Request

You may fax your request to MagneTek at (262) 782-3416, or mail to:

MagneTek
Ref: Training
16555 West Ryerson Road
New Berlin, WI 53151

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Appendix C – Replaceable Parts

Smart Trac LAN Parts List

The following table provides parts descriptions and MagneTek part numbers for the Smart Trac LAN card and associated hardware.

Table 3. Smart Trac LAN Parts List

Description	MagneTek Part Number	Qty
Smart Trac Arcnet Network Interface option kit	46S03643-0040	1 per Smart Trac AC 1
Connector, BNC Tee	05P00034-0540	1 per Smart Trac AC 1 or other networked device (computer, printer, etc.)
Technical Manual, Smart Trac LAN Card	TM 3554-0040	1
BNC 93 ohm terminator	05P00034-0586	1 per unused port
Smart Trac LAN RG-62/u coaxial cable, Arcnet Cable Assy, 6 ft	46S02995-0010	Option
Smart Trac LAN RG-62/u coaxial cable, Arcnet Cable Assy, 30 ft	46S02995-0020	Option
Smart Trac LAN RG-62/u coaxial cable, Arcnet Cable Assy, 20 ft	46S02995-0030	Option
Smart Trac LAN RG-62/u coaxial cable, Arcnet Cable Assy, 10 ft	46S02995-0040	Option
Smart Trac LAN RG-62/u coaxial cable, Arcnet Cable Assy, 14 ft	46S02995-0050	Option
Smart Trac LAN RG-62/u coaxial cable, Arcnet Cable Assy, 40 ft	46S02995-0070	Option

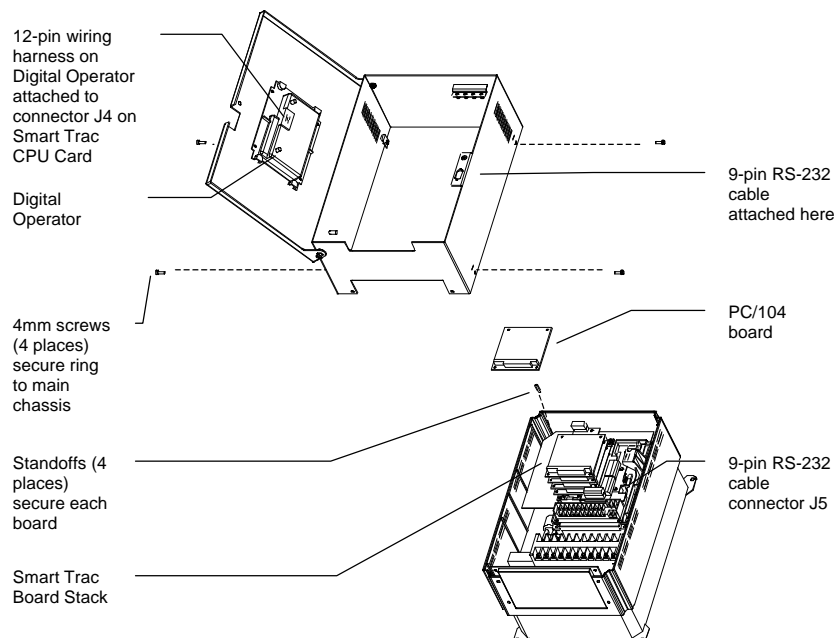
Table 3. Smart Trac LAN Parts List

Description	MagneTek Part Number	Qty
Smart Trac LAN RG-62/u coaxial cable, Arcnet Cable Assy, 50 ft	46S02995-0090	Option
Smart Trac LAN RG-62/u coaxial cable, Arcnet Cable Assy, 55 ft	46S02995-0100	Option
Smart Trac LAN RG-62/u coaxial cable, Arcnet Cable Assy, 80 ft	46S02995-0110	Option
Standoff, 4.5mm, Hex, Stl, CL ZINC, 14mm, M/F, M3, M3	05P00618-0005	4 each assembly (used on all assemblies except Smart Trac Genius card and qty 1 of Smart Trac CPU card)

Appendix D – 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.

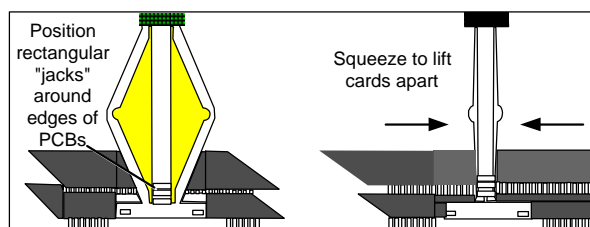


Figure 6. Using the PC/104 Extraction Tool.

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

Active hub	A device that accepts a data signal into a port, repeats the signal, regenerates it, and sends it to all connected ports (all devices networked through the active hub).
algorithm	A logical procedure for solving a problem.
ARCNET	Acronym for Attached Resource Computer Network, it is one of the oldest forms of networks. Created in 1977 by Datapoint Corporation, ARCNET uses token passing in combination with star/bus topology to transmit data at 2.5 Mbps (megabits per second). It is simple, inexpensive and reliable, and is a good solution for small LANs. Cabling may include RG-62, 90-ohm or 93-ohm coaxial, UTP and fiber optic. It will support as many as 255 nodes.
broadcast message	A type of LAN message in which one node sends information to all other nodes. The message contains the source of the message, but the destination is all nodes that have been enabled to receive broadcast messages.
channel	The second level address used to further define the location of information external to the programming environment. (The first level of addressing is the Node ID). To use a Channel number also requires use of the associated Node ID (i.e., Node 230, Channel 123).
conditional scan	A programmed scan of sub-programs that executes only when certain logic conditions related to a conditional scan task are satisfied.
directed message	A LAN message that is sent by one node and received only by the node addressed in the message. Also referred to as "directed."
Directed messages	Messages sent from one node to one other node.
hub	A connection device that receives a signal and transmits it to the connected devices.
IRQ	Acronym for Interrupt Request. A value that a device sends to a computer's central processing unit to interrupt processing when that device needs to send some information.
LED	Acronym for Light Emitting Diode.
node	An intelligent device connected to the Local Area Network (LAN). It is identified by a number from 1 to 255 and participates in token passing.
nodes	An ARCNET node is a device with an active ARCNET controller chip requiring an ARCNET device address.
PAC block	A function that has an associated symbol that is used in a MagneTek defined graphical programming environment called Program Application Control

	(PAC). The symbol represents executable code that is compiled (along with other connected symbols) to run on MagneTek equipment (i.e. drives).
packet	A packet or "data packet" is a grouped set of data sent to one or more nodes. A data packet might contain, for example, an Alert Burst, SOH (start of header character), SID, DID, Data Count, a variable amount of data, and a CRC check).
Passive hub	A non-powered device which receives a signal from one device on the network and sends it to all networked devices with no signal regeneration or amplification.
PC/104 specification	An embedded 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.
protocol	A set of formal rules describing how to transmit data, especially across a network. This includes electrical and physical standards at the lowest level to data formatting, the syntax of messages and the device to device dialogue at the highest levels.
Remote Display Unit	A device that connects into a drive and allows easy interface between the operator and the drive for setting parameters, viewing drive data, logging faults, and/or troubleshooting. It is used on previous generation MagneTek drives, before the Smart Trac series was introduced.
segment	<p>A local area network segment is any portion of the complete LAN cabling system isolated by one or more hub ports. The simplest network configuration, using no hubs at all, consists of only one segment with two or more nodes. An active controller chip requiring an address is a node. Hubs do not require addresses and, therefore, are not considered network nodes.</p> <p>Allowable segment cable length depends on the transceiver used and the type of cable installed.</p>
SubChannel	A SubChannel is the third level of definition of a location of information. By describing the Node ID, Channel # and SubChannel #, a specific input or output of a given Node and Channel is defined.
token-passing	A scheme used by some networks that employs the passing of a combination of bits, or token, which grants an "Invitation to Transmit," or ITT.

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MagneTek
Drives and Systems
16555 West Ryerson Road
New Berlin, WI 53151
(800) 541-0939, (262) 782-0200, FAX (262) 782-3418

