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ATR 9100 Production Description

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1 Description of Circuit Functions

Introduction:

The purpose of this document is to provide a product description for the Advantag 9100 electronics. The Advantag 9100 consist of two 2.8" x 3.5" size printed circuit boards, the ATR 9100,RADIO/POWER Interface (3200-1253-01), and ATR 9100, CONTROLLER (3200-1252-01). The ATR 9100, RADIO/PWR Interface contains power supplies, Controller Area Networking (CAN) driver and RFID with standard range and long range. The ATR 9100, CONTROLLER contains the Dallas Network Microcontroller (DS80C400, Intel LXT972A Dual-Speed Fast Ethernet 10/100BASE using RJ-45 connector and one RS-232 serial port.

The ATR 9100, Radio/PWR Interface and ATR 9100 Controller boards are connected through a Samtec 30 pin SMT 0.050" Board Stacker.

The ATR 9100 receives commands via either the Ethernet or RS 232 interface and translates these commands for use by the TI microreader. The TI micro-reader then decodes these commands to an RF protocol which address the associated transponder. The antenna is a .25inch diameter inductive loop type, which is resonated at 134.2kHz to generate the flux linkage to the transponder. The external power to the ATR9100 is a two-wire DC interface. The internal DC supplies and ground are isolated from the external supply lines to accommodate good conducted emissions performance and acceptable ESD performance.

The following paragraphs outline the circuit functions:

1.1.1 VCC3

VCC3 is 3.3 volts. To assure the reliable performance of the digital circuitry, VCC3 must be at $3.3V \pm 5\%$ (between 3.17V and 3.47V). VCC3 must be verified with the input supply voltage range of 24.0VDC. VCC3 is measured with respect to signal ground. VCC3 and signal ground can be found on connector pins TP1 and J1.5 of the 3200-1253-01 PCB respectively.

1.1.2 VCC10

VCC10 is 10.0 VDC. To assure the reliable performance of the RF circuitry, VCC10 must be 10.0 VDC $\pm 5\%$ (between 9.50V and 10.50V). VCC10 must be verified with the input supply voltage range of 24.0 VDC. VCC10 is measured with respect to signal ground. VCC10 and signal ground can be found on connector pins TP2 and J1.5 of the 3200-1253-01 PCB respectively.

1.1.3 VCC5

VCC5 is 5.00 volts to provide the TIRIS module must be $5.0 V \pm 5\%$ between 5.25V and 5.25V which input from VCC10. VCC5 is measured with respect to signal ground. VCC5 and signal ground can be found on pins U9.2 and J1.5 on 3000-1253-01ATR 9100, Radio/PWR INTF board respectively.

1.2 RADIO INTERFACE

An off the shelf TI micro-radio is used to interface the digital command form the CPU to the target transponder. The transmit carrier is 134.2 kHz which is AM modulated to address the transponder. The transponder, when queered, responds with two tone FSK for detection by the TI receiver.

2 ATR 9100 Digital Interface

2.1 Microcontroller Interface Initialization

2.1.1 Serial Interface

The ATR9100 provides an RS232 interface with no errors during R232 communications at baud rates of 9600 and 19200 baud.

2.1.2 SRAM

The ATR9100 provides an SRAM interface that must be read and write correctly.

2.1.3 Flash Memory

The ATR9100 provides an FLASH Memory interface that must erase, read and write correctly.

2.1.4 SW2

The ATR9100 has a DIP switch interface. The MSB bit is switch 1 and the LSB is switch 8. Each bit is logic 1 when the corresponding switch is in the off position, and logic 0 when in the on position. .

2.1.5 LEDs

2.1.5.1 D53 Power LED

Power indicator LED must light green when the normal operating power of VCC3 present.

2.1.5.2 D54 bi-color LED

The Read/Write status indicator LED's will light red and green when turned on via software control.

2.1.5.3 D55 LED

The Host control indicator LED's will light green when turned on via software control.

2.1.6 Remote Sensor

The ATR9100 provides a Remote presence sensor input reads logic 0 when 0.5V is applied to JS1-2 and reads logic 1 when JS1-2 is left floating. This test requires appropriate software to read the state of the sensor

2.2 CAN

The ATR9100 provides an CAN BUS interface with no errors during CAN communications at baud rates of 500Kbits/s.

2.3 Ethernet

The ATR9100 provides an Ethernet interface with no errors during Ethernet communications at baud rates of 100Mbps.

3 Mechanical

3.1 Switches

Reset switch, Code update switch, Range selection switch, and DIP switches are accessible via cut-outs in the enclosure.

3.2 Connectors

Antenna Connector BNC

RS232 Connector RJ45

Ethernet Connector RJ45

LED driver Connector RJ45

RJ45 connectors on enclosure must lock when the mating connectors are connected.

