



PRODUCT BRIEF Version 4.0

SI – AIO_65

Vehicle Data Terminal 2.0

March 2006

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Highlights

- Intel® PXA255 Processor with Intel® XScale Technology at 400MHz
- 64 KB Cache, 64 MB SDRAM and 128MB Flash
- 32-bit ARM7 micro controller operating at 60MHz
- Microsoft® Windows CE.NET 5.0 platform
- Real Time Clock with battery back-up
- 7" color TFT-LCD with touchscreen
- SD Card socket
- WLAN and Bluetooth Connectivity
- Quad-band GSM/GPRS or CDMA 2000 cellular Modem with Audio
- 12-channel GPS Receiver
- On-Board Diagnostics (OBDII), SAE J1708 and J1939 CAN Bus interface
- Impact Detection using 3-axis accelerometer
- Emergency Button (activates covert microphone)
- Ignition Detect for automatic on/off
- USB 2.0 compliant Host, Configurable On-The-Go (OTG)
- 10 Mbps Ethernet Support
- Audio In/Out
- Up to two full flow RS-232 ports
- Eight general-purpose digital I/Os
- Built-in power supply for 12/24V powered vehicle systems

Overview**Processor**

The Vehicle Data Terminal2.0 SI-AIO_65 is powered by the low-power 32-bit Intel® PXA255 Processor with Intel® XScale Technology operating at 400MHz. The PXA255 is ARM architecture v.5TE compliant and has Intel® Superpipelined RISC Technology. The processor has a built-in 32KB data and 32KB instruction cache and a 2KB Mini data cache for streaming data.

Memory

Apart from the 64KB cache, the SI-AIO_65 has 64MB SD RAM and 128MB Flash for higher performance. Further, the unit provides a connector for a Secure Digital (SD) card for more memory storage.

Operating System

The SI-AIO_65 is built on the latest Microsoft Windows CE.NET operating system. CE.NET version 5.0 provides enhanced real-time processing, greater interoperability, faster performance

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and richer multimedia and web browsing capabilities. The SI-AIO_10_4 can easily interface with personal computers, servers, web services, and other devices.

Display

The SI-AIO_65 uses a 6.5" color TFT-LCD with surface coating for wide viewing angle. The display has an overall dimensions of 165mm(W) x 104mm(H) with 640 x 480 resolution. The display has a typical brightness of 400 nits. The brightness is adjustable and the backlight can be turned off for power conservation. A four-wire resistive touchscreen is used.

Real Time Clock

The SI-AIO_65 features a battery powered Real Time Clock that comes standard.

Bluetooth

The SI-AIO_65 has a built-in Bluetooth Connectivity. The device is v1.1 compliant. The firmware features point-to-point and point-to-multipoint link management supporting data rates up to the theoretical maximum over RF Comm of 704 kbps.

802.11b WLAN

The SI-AIO_65 offers IEEE 802.11b connectivity. The unit also supports IEEE 802.11e and IEEE 802.11i with WMM Quality of Service enhancements and WPA Security enhancements. This is achieved through the Philips BGW200 chip. There is an SMA jack available for connecting to an external antenna on the topside of the unit.

GPRS/CDMA

The SI-AIO_65 comes with a choice of either a GPRS or a CDMA cellular modem for data communication. Two-way voice communication is available but at the expense of the second RS-232 channel.

The Quad-band GSM/GPRS Modem Module (Wavecom WISMO Quik Q2426) is capable of operating at E-GSM/GPRS 900/1800 or 850/1900 bi-band. The Module has a transmit power of 2W at EGSM 900/GSM 850 and 1W at 1800/1900MHz. The SIM card is user-accessible through an external connector with a locking mechanism.

The 1xRTT CDMA module (Wavecom WISMO Q2438) is capable of supporting the following four bands and modes: CDMA Band Class0 (Cellular 800MHz Band), CDMA

Band Class1 (PCS 1900 MHz Band), AMPS (Cellular 800MHz Band) and the Qualcomm gpsOne (L1 1575.42MHz Band). The audio channels of these modems can be accessed through the 25-pin connector.

GPS

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SI-AIO_65 can be ordered with an in-built 12-channel GPS receiver (Trimble Lassen iQ). This makes it suitable for in-vehicle applications. An SMA female connector is provided for antenna connection to the GPS.

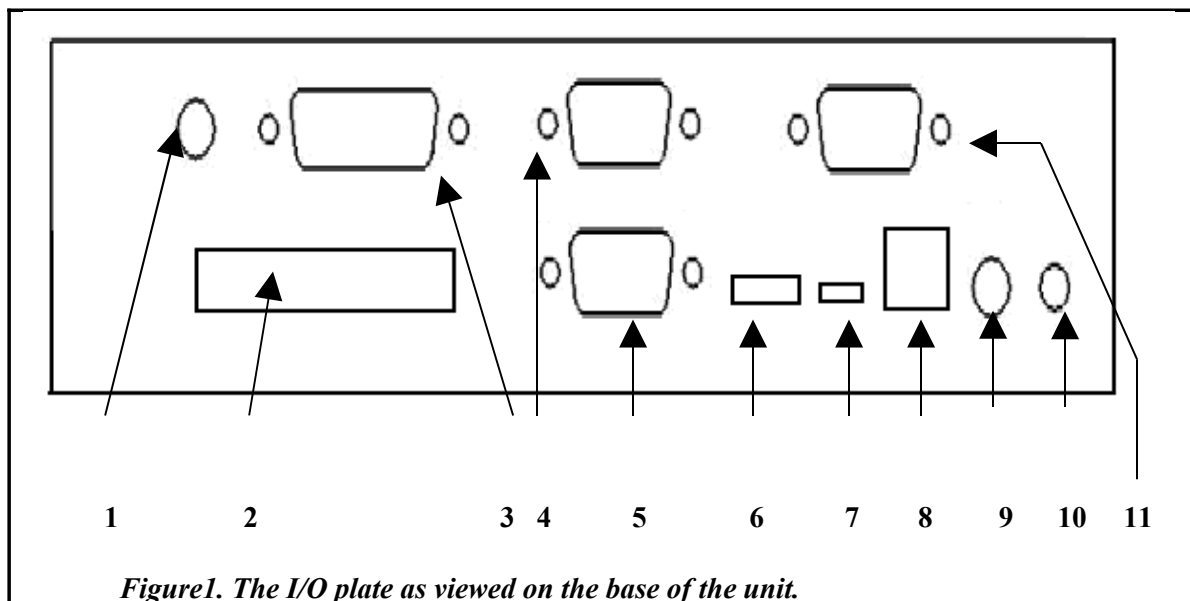
Accelerometer

The SI-AIO_65 comes with a three-axis accelerometer capable of handling up to $\pm 6g$. The third axis eliminates any mounting limitations, which are common to 2-axis devices.

This feature can be used to detect a vehicle impact, useful for alerting a central office or for accident reconstruction.

IO Connectors

All the IO connectors except the Antenna connector for Wi-Fi comes out at the base of the unit as shown in figure 1.



The connectors as numbered in figure 1 are listed below in detail:

1. Power and Ignition Detect

The built-in power circuit requires a supply voltage between 8V and 36VDC. The power connector also has an Ignition detect line to automatically wake the SI-AIO_65 from sleep mode. This feature is used to conserve battery when vehicle is off. The Ignition detect line has a voltage range of 8 – 36VDC with internal protection against over voltage. The pin-out of the 3-pin

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bulkhead connector, Switchcraft P/N # 17282-3PG-300 as viewed externally is shown in figure 2. The mating part number is Switchcraft P/N # 16282-3SG-311.

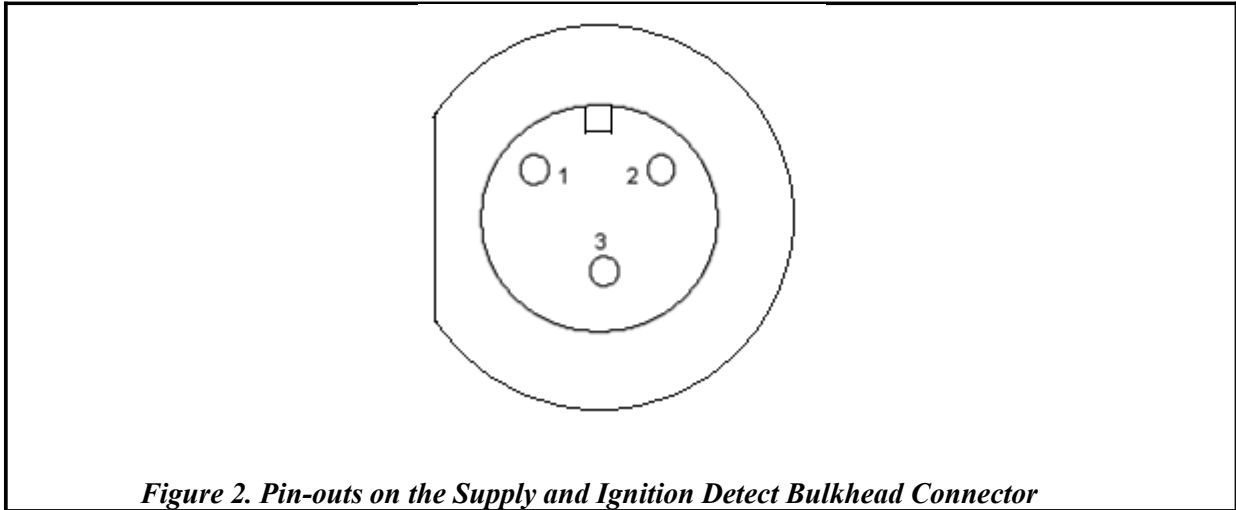


Figure 2. Pin-outs on the Supply and Ignition Detect Bulkhead Connector

Pin #	Description
1	Power (12 – 24VDC)
2	GND
3	IGN Detect

2. SD Card and SIM Card

A Secure Digital card socket is provided on the SI-AIO_65. Any standard SD storage card can be used on this slot for additional storage or updating CE.NET images. This slot is user-accessible externally.

There is also the SIM cardholder for the GPRS Modem.

3. Audio, Digital I/O, CAN, Odometer, Emergency and J1708

This is a DB25 connector with several lines. The SI-AIO_65 features 4 general-purpose inputs. These input lines can detect digital pulses (e.g. button presses) and have internal protection against over-voltage. The SI-AIO_65 also has four general-purpose outputs, which can source up to 0.2A each.

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Apart from the general-purpose I/O, the SI-AIO_65 has another digital input line for odometer reading. The Wheel Tick line requires positive input pulses to detect the speed.

In addition, one of the general-purpose input line may be programmed as an emergency button to detect if the emergency button is pressed. When the emergency button is pressed, the unit can trigger the operation of any preprogrammed sequence. For instance, it could automatically dial the dispatch office through the cellular modem.

Audio out lines from the system as well as the cell phone may be accessed through this connector. And Push-to-talk microphone may also be connected to this connector for use on the cell phone modem.

The J1708 and CAN bus, discussed in Connector 10 can also be accessed through this connector

4. COM A

COM A is an RS-232 interface through a standard Male DB9 Connector with full flow control (standard modem interface). The maximum baud rate is 115200.

5. COM B

COM B is also an RS-232 interface through a standard Male DB9 Connector with full flow control (standard modem interface). The maximum baud rate is 115200.

COMB will not be available in this unit if the Bluetooth option is selected.

6. USB Host

The SI-AIO_65 has a USB2.0 compliant full speed (12Mb/s) and low speed (1.5Mb/s) dedicated Host.

7. USB On-The-Go

The SI-XS_AIO_7 has a USB2.0 compliant full speed (12Mb/s) and low speed (1.5Mb/s) On-The-Go (OTG) port. The OTG port may also be configured as a dedicated host if needed.

8. Ethernet

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The SI-AIO_65 comes Ethernet-ready with a standard RJ-45 connector with integrated LEDs. The Ethernet operates at a maximum of 10/100 Mbits/sec. The Ethernet port is useful for CE.NET software updates and other data transmissions.

9. GPS Antenna

This is a 50-Ohm bulkhead SMA jack for antenna to the GPS module.

10. Cell Phone Antenna

This is a 50-Ohm bulkhead SMC jack for antenna to the CDMA / GPRS module. This is drilled only if using optional cell phone modem.

11. OBDII Vehicle Interface

The SI-AIO_65 has a 9-pin female D-Sub connector to interface to the On-Board Diagnostics Phase-2 (OBDII) port on the vehicle. The pin descriptions are given in Table 1. The OBDII vehicle interface on the SI-AIO_65 includes all OBDII protocols:

- J1850 PWM, the 41.6 kHz protocol commonly used in Ford Motor Company vehicles.
- J1850 VPW, the 10.4 kHz protocol commonly used in General Motors and some Daimler-Chrysler vehicles
- ISO 9141 and ISO 14230 (KWP2000), which are protocols that are commonly used in imported vehicles such as Volkswagen.
- J1939 CAN Bus interface

Pin# on DB9	Pin# on J1962 OBD	Description
1	5	Signal GND
2	4	Chassis GND
3	6	High Speed CAN H
4	7	ISO 9141-2K
5	9	High Speed CAN L
6	10	J1850 -
7	2	J1850 +
8	15	ISO 9141-2 L
9	16	Battery Positive

Table 1. Pin Descriptions of the female DB9 and J1962 OBD pins for OBDII interface



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