

**Electrical Interface (10-Pin) Signals
For
Palm™ Organizers
(Original Interface)**

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Electrical Interface Signals For Palm™ Organizers: Pilot, PalmPilot™, Palm™ III, Palm™ VII, Palm™ VIIx

The organizer's 10 pin edge connection has some TIA/EIA-562 interface signals and some additional signals to support the use of the synchronizing cradle and the Palm™ Modem. Looking at the back of the organizer, the pins are defined 1 to 10 moving from right to left.

PIN#	Signal Name & Direction	Function
1	DO (out)	Nonstandard implementation of DTR. Signal is named RS232_V+. This is the voltage doubler output from the transceiver's V+ pin (pin 3) through a 330-ohm resistor, it is used as the Data Terminal Ready signal. When the serial port is "opened" by the Serial Manager, it enables the transceiver and the UART. As long as the transceiver is enabled this pin outputs an asserted signal. The signal is 3.0 volts when the transceiver is shutdown (normal mode) and is about 6.0 volts when the transceiver is enabled (HotSync). When this signal is at 6.0 volts it is a valid assertion. Note: According to spec, a 3.0 volt signal constitutes a valid assertion, but it "seems" at the time that all pocket modems which require DTR being valid, simply have a logic detector to detect the signal being greater than about 4 volts, so effectively 3 volts is not a valid assertion and that is why this simple implementation works.
2	VCC (out)	This is tied to VCC (3.3v) through a 330 ohm resistor. This pin is connected to the HotSync® button (normally open) on both the cradle and the Palm Modem. The other side of the HotSync button connects to pin 7 (HS IRQ).
3	RXD (in)	Receive Data -- from PC to organizer
4	RTS (out)	Request To Send -- hardware flow control handshake signal
5	TXD (out)	Transmit Data -- from organizer to PC
6	CTS (in)	Clear To Send -- hardware flow control handshake signal
7	HS IRQ (in)	Interrupt line for waking the device, Palm OS default is to initiate the HotSync process. Input resistance is (57K ohms +- 10%). To assert, requires a level of about 0.86 volt or greater. This pin is connected to the HotSync® button (normally open) on both the cradle and the Palm Modem. The other side of the HotSync button connects to pin 2 (VCC).
8	ID (in)	Peripheral ID line. Input resistance is (57K ohms +- 10%). To assert a "Modem connected" ID signal to the processor, the Palm Modem connects this pin to pin 2 through a 20K ohm resistor.
9	unused	Not connected. Palm, Inc. reserves this for future designs.
10	SG	Signal Ground

- Voltage regulator used (VCC is 3.3 Volts +- 0.2Volts):
 - Pilot organizer 1000/5000 -- Micro Linear ML4851CS-3
 - PalmPilot™ organizer Personal/Professional -- Micro Linear ML4851CS-3
 - Palm™ III organizer -- Micro Linear ML4851CS-3
 - Palm™ VII organizer -- Micro Linear ML4861CS-3
 - Palm™ VIIx organizer -- Micro Linear ML4861CS-3

- Transceivers used:
 - Pilot organizer 1000/5000 -- Maxium MAX3222;
 - PalmPilot™ organizer Personal/Professional -- Sipex SP385ACA, Linear Technology LTC1385CG
 - Palm™ III organizer -- Sipex SP385ACA
 - Palm™ VII organizer -- Sipex SP385ACA, Linear Technology LTC1385CG, Analog Devices ADM1385ARS
 - Palm™ VIIx organizer -- Sipex SP385ACA, Linear Technology LTC1385CG, Analog Devices ADM1385ARS
 - Maximum transmission rate is 115,200 bps, using the modem it is limited to 57,600 bps.
 - The DTR signal is not a standard implementation. It is important because some modems will not function without it and have no override. At the time Palm found that this is particularly true with modems sold in Europe.
 - RTS and CTS are used to communicate at speeds above 2400 bps.
 - These organizer's do not implement DSR, RI, CD and TC.
 - No TC (Transmitter Clock) means synchronous transmission is not possible.

Electrical Interface Signals For Palm™ Organizers: Palm™ IIIx, Palm™ IIIe, and Palm™ IIIxe

The organizer's 10 pin edge connection has some TIA/EIA-562 interface signals and some additional signals to support the use of the synchronizing cradle and the Palm™ Modem. Looking at the back of the organizer, the pins are defined 1 to 10 moving from right to left.

PIN#	Signal Name & Direction	Function
1	DO (out)	Nonstandard implementation of DTR. Signal is named RS232_V+. This is the voltage doubler output from the transceiver's V+ pin (pin 3) through a 330-ohm resistor, it is used as the Data Terminal Ready signal. When the serial port is "opened" by Serial Manager, it enables the transceiver and the UART. As long as the transceiver is enabled this pin outputs an asserted signal. The signal is 3.0 volts when the transceiver is shutdown (normal mode) and is about 6.0 volts when the transceiver is enabled (HotSync). When this signal is at 6.0 volts it is a valid assertion. Note: According to spec, a 3.0 volt signal constitutes a valid assertion, but it "seems" at the time that all pocket modems which require DTR being valid, simply have a logic detector to detect the signal being greater than about 4 volts, so effectively 3 volts is not a valid assertion and that is why this simple implementation works.
2	VCC (out)	This is tied to VCC (3.3V) through a 330 ohm resistor. This signal is connected to the HotSync® button (normally open) on both the cradle and the Palm Modem. The other side of the HotSync button connects to pin 7 (HS IRQ).
3	RXD (in)	Receive Data -- from PC to organizer
4	RTS (out)	Request To Send -- hardware flow control handshake signal
5	TXD (out)	Transmit Data -- from organizer to PC
6	CTS (in)	Clear To Send -- hardware flow control handshake signal
7	HS IRQ (in)	Interrupt line for waking the device, Palm OS default is to initiate the HotSync process. Input resistance is (57K ohms +- 10%). To assert, requires a level of about 0.86 volt or greater. This pin is connected to the HotSync® button (normally open) on both the cradle and the Palm Modem. The other side of the HotSync button connects to pin 2 (VCC).
8	ID (in)	Peripheral ID line. Input resistance is (142K ohms +- 1.3%). To assert a "Modem connected" ID signal to the processor, the Palm Modem connects this pin to pin 2 through a 20K ohm resistor.
9	unused	Not connected. Palm, Inc. reserves this for future designs.
10	SG	Signal Ground

- Voltage regulator used (VCC is 3.3 Volts +- 0.2Volts): Micro Linear ML4851CS-3
- Transceivers used:
Linear Technology LTC1385CG, Sipex SP385ACA, Maxim MAX3385ECAP, Analog Devices ADM1385ARS
 - Maximum transmission rate is 115,200 bps, using the modem it is limited to 57,600 bps.
 - The DTR signal is not a standard implementation. It is important because some modems will not function without it and have no override. At the time Palm found that this is particularly true with modems sold in Europe.
 - RTS and CTS are used to communicate at speeds above 2400 bps.
 - These organizer's do not implement DSR, RI, CD and TC.
 - No TC (Transmitter Clock) means synchronous transmission is not possible.

Electrical Interface Signals For Palm™ Organizers:

Palm™ V except if the serial number has 0GN, or 0GP in digits 2 through 4.

Palm™ Vx except if the serial number has 0GK, 0GV, 0GW, 0GX, or 0H2 in digits 2 through 4.

The organizer's 10 pin connector has some TIA/EIA-562 interface signals and some additional signals to support the use of the synchronizing cradle and the Palm V™ Modem. Looking at the back of the organizer, the pins are defined 1 to 10 moving from right to left.

PIN#	Signal Name & Direction	Function
1	DO(out)	Nonstandard implementation of DTR. The voltage doubler output from the transceiver's V+ pin (pin 3) named RS232_V+. * This is used as the Data Terminal Ready signal. When the serial port is "opened" by the Serial Manager, it enables the transceiver and the UART. As long as the transceiver is enabled this pin outputs an asserted signal. The signal is 3.0 volts when the transceiver is shutdown (normal mode) and is about 6.0 volts when the transceiver is enabled during synchronization. When this signal is at 6.0 volts it is a valid assertion. Note: According to spec, a 3.0 volt signal constitutes a valid assertion, but it "seems" at the time that all pocket modems which require DTR being valid, simply have a logic detector to detect the signal being greater than about 4 volts, so effectively 3 volts is not a valid assertion and that is why this simple implementation works.
2	VBATT +	This is tied to the battery + (VBATT_HI) through an inductor (HF 70 ACC321611). This signal is connected to the HotSync® button (normally open) on both the cradle and the Palm Modem. The other side of the HotSync button connects to pin 7 (HS IRQ). Warning: The battery connected here is Li-Ion . Only an approved Palm charging device should be used to charge the battery, because: 1) Applying a trickle charge can damage the battery 2) Exceeding the maximum voltage can cause the battery to explode
3	RXD (in)	Receive Data -- from PC to organizer. *
4	RTS (out)	Request To Send -- hardware flow control handshake signal. *
5	TXD (out)	Transmit Data -- from organizer to PC. *
6	CTS (in)	Clear To Send -- hardware flow control handshake signal. *
7	HS IRQ (in)	Interrupt line for waking the device, Palm OS default is to initiate the HotSync process. Input resistance is (57K ohms +- 10%). To assert, requires a level of about 0.86 volt or greater. This pin is connected to the HotSync® button (normally open) on both the cradle and the Palm V Modem. The other side of the HotSync button connects to pin 2 (VBATT +).
8	ID (in)	Peripheral ID line. Input resistance is (33,330 ohms +- 10%). To assert a "Modem connected" ID signal to the processor, the Palm V Modem connects this pin to pin 2 (VBATT +) through a (20K ohm +- 5%) resistor. To assert a CHARGER_ID signal to the processor requires an input level in the range of 1.62 Volts to 2.51 Volts.
9	unused	Not connected. Palm, Inc. reserves this for future designs.
10	SG	Signal Ground. This is tied to the battery - (VBATT_LO) through an inductor (HF 70 ACC321611)

* This signal passes through two 150 ohm resistors connected in series, at their center junction a 330pF 50Vcapacitor is connected to VBATT_LO.

- Voltage regulator used (Internal VCC is 3.3 Volts +- 0.2Volts): Linear Technology LT1610CSM8
- Transceivers used: Linear Technology LTC1385CG, Maxim MAX3385ECAP, Sipex SP385ECA-1/TR
 - Maximum transmission rate is 115,200 bps, using the modem it is limited to 57,600 bps.
 - The DTR signal is not a standard implementation. It is important because some modems will not function without it and have no override. At the time Palm found that this is particularly true with modems sold in Europe.
 - RTS and CTS are used to communicate at speeds above 2400 bps.
 - These organizer's do not implement DSR, RI, CD and TC.
 - No TC (Transmitter Clock) means synchronous transmission is not possible.

Electrical Interface Signals For Palm™ Organizers:

Palm™ V if the serial number has 0GN, or 0GP in digits 2 through 4.

Palm™ Vx if the serial number has 0GK, 0GV, 0GW, 0GX, or 0H2 in digits 2 through 4.

The organizer's 10 pin connector has some TIA/EIA-562 interface signals and some additional signals to support the use of the synchronizing cradle and the Palm V™ Modem. Looking at the back of the organizer, the pins are defined 1 to 10 moving from right to left.

PIN#	Signal Name & Direction	Function
1	DTR(out)	Data Terminal Ready – (transceiver pin 15) from organizer to PC.
2	VBATT +	This is tied to the battery positive (VBATT_HI). This signal is connected to the HotSync® button (normally open) on both the cradle and the Palm Modem. The other side of the HotSync button connects to pin 7 (HS IRQ). Warning: The battery connected here is Li-Ion . Only an approved Palm charging device should be used to charge the battery, because: 1) Applying a trickle charge can damage the battery 2) Exceeding the maximum voltage can cause the battery to explode
3	RXD (in)	Receive Data -- from PC to organizer.
4	RTS (out)	Request To Send -- hardware flow control handshake signal.
5	TXD (out)	Transmit Data -- from organizer to PC.
6	CTS (in)	Clear To Send – hardware flow control handshake signal.
7	HS IRQ (in)	Interrupt line for waking the device, Palm OS default is to initiate the HotSync process. Input resistance is (21K ohms +- 10%). To assert, requires a level of about 1.47 volts or greater. This pin is connected to the HotSync® button (normally open) on both the cradle and the Palm V Modem. The other side of the HotSync button connects to pin 2 (VBATT+).
8	ID (in)	Peripheral ID line. Input resistance is (37,700 ohms +- 10%). To assert a “Modem connected” ID signal to the processor, the Palm V Modem connects this pin to pin 2 (VBATT +) through a (20K ohm +- 5%) resistor. To assert a CHARGER_ID signal to the processor requires an input level in the range of 1.83 Volts to 2.85 Volts.
9	unused	Not connected. Palm, Inc. reserves this for future designs.
10	SG	Signal Ground. This is tied to the battery negative (VBATT_LO).

- Voltage regulator used (Internal VCC is 3.3 Volts +- 0.2Volts):
Seiko S-814A33AMC-BCX-T1, Telcom TC1224-3.3VCTTR
- Transceivers used: Maxim MAX3386ECUP, Sipex SP3203ECY
 - Maximum transmission rate is 115,200 bps, using the modem it is limited to 57,600 bps.
 - RTS and CTS are used to communicate at speeds above 2400 bps.
 - These organizer's do not implement DSR, RI, CD and TC.
 - No TC (Transmitter Clock) means synchronous transmission is not possible.

Electrical Interface Signals For Palm™ Organizers: Palm™ IIIc

The organizer's 10 pin edge connection has some TIA/EIA-562 interface signals and some additional signals to support the use of the synchronizing cradle and the Palm™ Modem. Looking at the back of the organizer, the pins are defined 1 to 10 moving from right to left.

PIN #	Signal Name & Direction	Function
1	DTR (out)	Data Terminal Ready – (transceiver pin 15) from organizer to PC.
2	VCC (out)	This is tied to VCC (3.3v) through a 330 ohm resistor. This signal is connected to the HotSync® button (normally open) on both the cradle and the Palm Modem. The other side of the HotSync button connects to pin 7 (HS IRQ).
3	RXD (in)	Receive Data – (transceiver pin 13) from PC to organizer
4	RTS (out)	Request To Send – (transceiver pin 16) hardware flow control handshake signal
5	TXD (out)	Transmit Data – (transceiver pin 17) from organizer to PC
6	CTS (in)	Clear To Send – (transceiver pin 14) hardware flow control handshake signal
7	HS IRQ (in)	Interrupt line for waking the device, Palm OS default is to initiate the HotSync process. Input resistance is (20K ohms +- 10%). To assert, requires a level of about 1.4 volts or greater. This pin is connected to the HotSync® button (normally open) on both the cradle and Palm Modem. The other side of the HotSync button connects to pin 2 (VCC).
8	ID (in)	Peripheral ID line. Input resistance is (20K ohms +- 10%). To assert a “Modem connected” ID signal to the processor, the Palm Modem connects this pin to pin 2 (VCC) through a (20K ohm +- 5%) resistor.
9	DC_IN_PLUS(in)	Positive terminal for the supply voltage that powers the internal charging circuit that came with the Li-Ion battery. The output of the approved Palm charger (Motorola model R410510 power supply) is 5.0 VDC+-5% @ 1.0 A.
10	SG	Signal Ground, Charging Ground (DC_IN_MINUS)

- Voltage regulator used (VCC is 3.3 Volts +- 0.2Volts): Linear Technology LTC1474CMS8-3.3
- Transceivers used: Maxim MAX3386ECUP, Sipex SP3203ECY
 - Maximum transmission rate is 115,200 bps, using the modem it is limited to 57,600 bps.
 - RTS and CTS are used to communicate at speeds above 2400 bps.
 - These organizers do not implement DSR, RI, CD and TC.
 - No TC (Transmitter Clock) means synchronous transmission is not possible.

Electrical Interface Signals For Palm™ Organizers: Palm™ m100, Palm™ m105

The organizer's 10 pin edge connection has some TIA/EIA-562 interface signals and some additional signals to support the use of the synchronizing cradle and the modem for Palm™ m100. Looking at the back of the organizer, the pins are defined 1 to 10 moving from right to left.

PIN #	Signal Name & Direction	Function
1	DTR (out)	Data Terminal Ready – (transceiver pin 17) from organizer to PC.
2	VCC (out)	This is tied to VCC (3.3v) through a 330 ohm resistor. This signal is connected to the HotSync® button (normally open) on both the cradle and the modem for the Palm m100. The other side of the HotSync button connects to pin 7 (HS IRQ).
3	RXD (in)	Receive Data – (transceiver pin 14) from PC to organizer
4	RTS (out)	Request To Send – (transceiver pin 16) hardware flow control handshake signal
5	TXD (out)	Transmit Data – (transceiver pin 15) from organizer to PC
6	CTS (in)	Clear To Send – (transceiver pin 13) hardware flow control handshake signal
7	HS IRQ (in)	Interrupt line for waking the device, Palm OS default is to initiate the HotSync process. Input resistance is (20K ohms +- 10%). To assert, requires a level of about 1.4 volts or greater. This pin is connected to the HotSync® button (normally open) on both the cradle and the modem for the Palm m100. The other side of the HotSync button connects to pin 2 (VCC).
8	ID (in)	Peripheral ID line. Input resistance is (110K ohms +- 10%). To assert a “Modem connected” ID signal to the processor, the Palm Modem connects this pin to pin 2 (VCC) through a (20K ohm +- 5%) resistor
9	unused	Not connected. Palm, Inc. reserves this for future designs.
10	SG	Signal Ground

- Voltage regulator used (VCC is 3.3 Volts +- 0.2Volts): Micro Linear ML4851CS-3
- Transceivers used: Maxim MAX3386ECUP, Sipex SP3203ECY
 - Maximum transmission rate is 115,200 bps, using the modem it is limited to 57,600 bps.
 - RTS and CTS are used to communicate at speeds above 2400 bps.
 - These organizer's do not implement DSR, RI, CD and TC.
 - No TC (Transmitter Clock) means synchronous transmission is not possible.