# DPC-9600   9600bps serial data encoder/decoder chip

Interfacing the DPC-9600 data packet controller between any serial data host such as a PC or microprocessor and any of ABACOM's transmitter and receiver modules provides a quick and easy, single chip solution to data formating and data packetizing requirements necessary for successful wireless serial data communications. The DPC-9600 saves the designer the burden and time of having to write their own code to packetize and encode/decode their data.

- Transparent operation
- Processes up to 8 bytes of data at a time (ie per transmission)
- Optional transmit and receive flow control lines included
- Convenient Test Mode for diagnostics
- 9600,8,N,1 protocol
- Standard serial data in/out

Transmit Mode
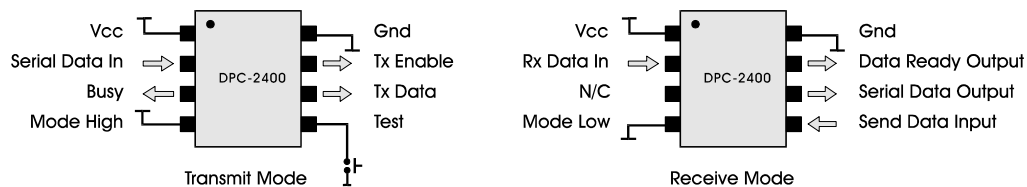
Receive Mode

Pin	Function - Mode Pin High - Transmit	Function - Mode Pin Low - Receive
1	Vcc +5V supply	Vcc +5V supply
2	Serial data input, 9600bps	Data input from receiver
3	Busy Output. High whilst transmitting	No connection. Factory test point.
4	Mode pin - high (Vcc) to select Tx mode	Mode pin - low (0V) to select Rx mode
5	Test input. Active low. Sends 8 byte test message	Send data input. Pull high to send the data in the receive buffer
6	Transmit data output to RF transmitter	Serial data output. 9600bps
7	Transmit enable output to RF transmitter. Active high.	Data ready output flag. Goes low when valid data is present in buffer.
8	Ground. 0 Volt	Ground. 0 Volt

The DPC-9600 is ideal for (but not limited to) applications that require the sending of short 'control and sense' type commands as typically used in:

- Data acquistion
- Control Systems
- Hand held treminals
- Security

By implementing the BUSY control line, data consisting of more than eight bytes can be automatically trans-mitted.

DPC-9600—Encoding Mode

Detailed Pin Description

Pin 1– +5V Supply

This pin should be decoupled to ground with a 0.1uF capacitor.

Pin 2 – Data Input

Serial data from the transmitting host to be encoded and transmitted by the RF transmitter interfaced DPC-9600, is input on pin 2. The DPC-9600 expects CMOS/TTL level serial data in the form of 2400bps, logic 0 start bit, 8data bits, no parity and 1 stop bit .

RS232 level Data

Where the transmitting host's data levels are RS232, as from a PC for example, an RS-232 level converter should be interfaced between the host and the DPC-9600 in order to convert the data into the correct format for the DPC-9600.

The data format required for the DPC-9600 version will be 9600bps, a start bit, 8 data bits and 1 stop bit.

In the absence of serial data, pin 2 must be held in a logic high state.

Note that if pin 2 is not held at the appropriate levels in the absence of data, the DPC-9600 will recognize this condition as valid data and will erroneously process the data since it will recognize this condition as a valid start bit.

The DPC-9600 is designed for data rates at 9600bps and therefore it is important that the transmitting and receiving hosts are configured to send and receive data at 9600bps.

Pin 3—Busy Control Line

The busy control line goes high when the DPC-9600 is busy passing data received from the host to its the encoded data output for RF wireless transmission. This line goes high either when the DPC-9600 has received its maximum of 8 bytes or when it has detected the end of incoming data (under conditions when < 8 bytes have been received from the host).

The function of the busy line pin 3 is for data flow control with the host. Implementing the busy line is necessary in applications where more than 8 bytes are to be transmitted. Under these circumstances, the DPC-9600 will receive the first 8 bytes of data, and then use the busy line to signal the host to pause sending data until it is ready to receive the next bytes of data.

If the DPC-9600 is connected to the COM port of a PC for example, the busy line should be connected to the CTS flow control line (pin 8 of the DB9 connector) via an RS232 level converter such as the MAX232. The remaining flow control lines on the DB9 connector can be looped back on the connector (ie link DSR pin 4 and DTR pin 6). The terminal software interface being used should have hardware flow control active).

Pin 4– Mode

The mode pin configures the DPC-9600 to operate as either an encoder or as a decoder. Connected to Vcc configures the DPC-9600 for data encoding and connected to ground configures the DPC-9600 for data decoding.

Pin 5– Test

This pin is active low and should be pulled high via a 10KΩ resistor. When taken low, typically via a tactile feedback pushbutton switch or any other dry contact, the data input pin 2 will be ignored and an 8 byte internal message will be output on pin 6. The content of this test message will be:

<ABACOM>

The test message is intended for diagnostic purposes and serves as a quick test to verify the integrity of the RF link. With a receiving host PC running a simple terminal program such as Hyperterminal configured for 9600,8,N,1 the content of the test message in a correctly configured RF wireless link will be displayed.

Pin 6– Encoded Data Output

Data received at pin 2 (Data IN) from transmitting host is encoded by the DPC-9600 and fed out to the data input pin of the RF transmitter via pin 6.

Pin 7– TX Enable

The TX enable pin is active high and can source up to 20mA. When the DPC-9600 outputs encoded data on the encoded data output pin 6, the TX enable pin is at a high level and may be used to enable the RF transmitter module ensuring that the transmitter is active only for the duration of the data transmission.

For OOK (AM) type transmitter modules, this pin may be left unconnected since the data will be controlling the RF transmission.

Pin 8– Ground

Connect to supply ground.

DPC-9600 Decoding Mode

Pin 1– +5V Supply

This pin should be decoupled to ground with a 0.1uF capacitor.

Pin 2– Encoded Data Input

The data output of the RF receiver module will feed the encoded data input pin 2 of the DPC-9600. Valid received encoded data entering the DPC-9600 at pin 2 will be decoded by the DPC-9600 and the original data from the transmitting host will be recovered and made available for output at the DPC-9600 decoded data output pin 5.

Pin 3– No Connection

This pin has no function and may be left unconnected.

Pin 4– Mode

The mode pin configures the DPC-9600 to oper-

ate as an encoder or as a decoder.
Connected to Vcc configures the DPC-9600 for data encoding and connected to ground configures the DPC-9600 for data decoding.

Pin 5– Send Data Output

The send data control line is active high. When taken high, the data received from the transmitting host will be released to the encoded data output pin 6. If held low, the data received from the host will be held in the DPC-9600's buffer until "send data" is taken high. The send data control line functions in association with the data ready pin 7.

Pin 6– Decoded data Output

Encoded data that has been received by the DPC-9600 from the RF receivers data output will be decoded by the DPC-9600 and the original serial data that was sent from the transmitting host will be reproduced at the decoded data output pin 6. This original data will be flow out of pin 6 on condition that the send data control pin 5 is high. If the control pin 5 is low, the data output pin 6 will be inhibited and the data will be held in the DPC-9600 buffer.

Pin 7– Data Ready Output

When the decoding DPC-9600 has received valid data, the data ready control line may be used to signal the receiving host that the DPC-9600 has valid data ready to upload. The receiving host then asserts a logic high level on the "send data" line at pin 5 and the data is uploaded.

Many applications that require the received data from the DPC-9600 decoder to be uploaded to the host without supervision, do not require interfacing the data ready control line. For these applications, the data ready pin 7 may be left unconnected and the send data pin 5 then simply tied high. In this configuration, the decoded data will upload to the host automatically.

Pin 8– Ground

Connect to supply ground.

Application Examples

Schematic A

The DPC-9600 is configured as an encoder and interfaced to a CMOS/TTL host such as a microcontroller. Serial data is transmitted to the DPC-9600 in standard serial format. The Busy control line is implemented where the DPC-9600 signals the host to pause sending data whilst it is busy processing the 8 bytes received.
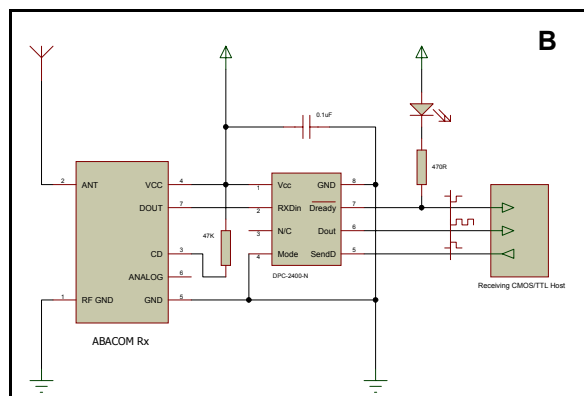
If the host was and RS-232 port of a PC for example, an RS-232 level converter IC such as the MAX 232 would be required between the host and the DPC-9600
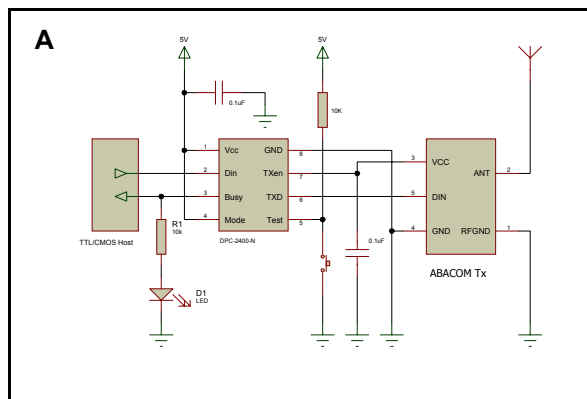
Schematic B

The DPC-9600 is configured as a decoder and interfaced to a CMOS/TTL host such as a microntroller. The flow control lines 5 & 7 have been implemented. Data ready signals the host that the DPC-9600 has data available to upload. Host then signals the DPC-2400 to send its data via the send data input. The DPC-9600 uploads the data to the host.

If the receiving host was an RS-232 port of a PC for example, an RS-232 level converter IC such as the MAX232 would be required between the DPC-9600 and the host.

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Technical Specifications

| PARAMETER	MIN	TYPICAL	MAX	UNITS	NOTES
Supply Voltage	4.75	5.0	5.25	V	
Supply Current	1.8		2.4	mA	
Serial IN/OUT data rate		9600		bps	1
Byte Time		4.16		mS	2
TX enable source current		8.0	20	mA	
Operating temperature	0	20	40	°C	
Storage temperature	-40		+85	°C	

Notes:

1.   The DPC-9600 expects a logic 1 start bit and a logic 0 stop bit.
2.   1 start bit, 8data bits, no parity bit, 1 stop bit: Total of 10 bits @ 104uS/bit = 0.104mS

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DPC-9600 Packaging

The DPC-9600 is available in a 208 mil, 8 lead SOIC package or in a standard 8 pin DIP package.

Package Type: K04-056 8-Lead Plastic Small Outline (SM) – Medium, 208 mil
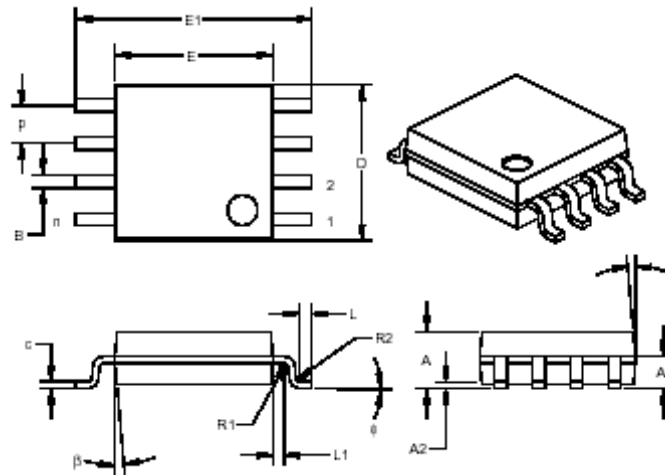
Units		INCHES*			MILLIMETERS		
Dimension Limits		MIN	NOM	MAX	MIN	NOM	MAX
Pitch	p		0.050			1.27	
Number of Pins	n		8			8	
Overall Pack. Height	A	0.070	0.074	0.079	1.78	1.89	2.00
Shoulder Height	A1	0.037	0.042	0.048	0.94	1.06	1.21
Standoff	A2	0.002	0.005	0.009	0.05	0.14	0.22
Molded Package Length	D‡	0.200	0.205	0.210	5.08	5.21	5.33
Molded Package Width	E‡	0.203	0.208	0.213	5.16	5.28	5.41
Outside Dimension	E1	0.300	0.313	0.325	7.62	7.94	8.26
Shoulder Radius	R1	0.005	0.005	0.010	0.13	0.13	0.25
Gull Wing Radius	R2	0.005	0.005	0.010	0.13	0.13	0.25
Foot Length	L	0.011	0.016	0.021	0.28	0.41	0.53
Foot Angle	θ	0	4	8	0	4	8
Radius Centerline	L1	0.010	0.015	0.020	0.25	0.38	0.51
Lead Thickness	c	0.008	0.009	0.010	0.19	0.22	0.25
Lower Lead Width	B†	0.014	0.017	0.020	0.36	0.43	0.51
Mold Draft Angle Top	α	0	12	15	0	12	15
Mold Draft Angle Bottom	β	0	12	15	0	12	15

* Controlling Parameter.

† Dimension "B" does not include dam-bar protrusions. Dam-bar protrusions shall not exceed 0.003" (0.076 mm) per side or 0.006" (0.152 mm) more than dimension "B."

‡ Dimensions "D" and "E" do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010" (0.254 mm) per side or 0.020" (0.508 mm) more than dimensions "D" or "E."

Disclaimer:

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