

RDF PRODUCTS

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Product Data Sheet; Model DFP-1010D

Single-Channel Watson-Watt - Ethernet Computer-Operated DF Bearing Processor

FEATURES

- Adds DF Capability to Most Receivers
- Real-Time Remote Operation w/Software
- Optional built-in HuntMaster dongle
- Ethernet control of DFP, Radio & GPS
- Simultaneous DF & Radio Listen-Through
- Ultra-Fast Pulse Response Capability
- 6/15/30/200 kHz IF Bandwidths

DESCRIPTION

The RDF Products Model DFP-1010D is a single-channel software defined Watson-Watt DF bearing processor unit that, in conjunction with an appropriate RDF Products DF antenna economically adds DF capability to almost any receiver. The DFP-1010D is a professional-quality unit that is compact, rugged, and easy to operate.

DF receivers traditionally have been very expensive as a result of low-volume production. With the “add-on” DF bearing processor concept as embodied in the DFP-1010D, however, DF capability can be achieved far more economically by using either an existing receiver or one of the many highly capable wide frequency coverage low-cost consumer-market receivers.

The DFP-1010D easily interfaces to most receivers via its standard 10.7 MHz IF interface. The unit can also interface to host receivers with custom IF frequencies in the range 3.5 to 52.0 MHz via software defined IF frequency. As a result, the DFP-1010D can interface to most any receiver with excellent results.

Unlike most competing add-on DF bearing processors, the bearing accuracy of the DFP-1010D is nearly impervious to host receiver anomalies associated with group delay variations and AGC characteristics. As a result, there is no need to implement expensive and time-consuming modifications to the host receiver in order to make it “DF-ready”.



The DFP-1010D is designed exclusively for computer-controlled operation and has no operational manual controls, displays, or indicators. It is ideal for fixed-site DF applications, unmanned remote DF applications, and any DF application in general where computer-controlled rather than manual operation is necessary or preferred.

Full remote capability is provided via a single Ethernet port. With the software provided, all features can be controlled and outputs displayed at the host computer. Additional serial ports are provided for connection of a host receiver, GPS receiver, and optional digital compass so that all of these peripheral system components can be managed at the host computer via the single Ethernet connection without the need for cumbersome external data multiplexers or hubs. The “open” TCP/IP control protocol is published in detail for the benefit of users who wish to write custom software.

The DFP-1010D software controls the host receiver frequency, demodulation mode and IF bandwidth allowing for simultaneous DF operation and listen-through capability. RF attenuator, squelch, volume and FFT display controls are also included for easy operation. Other features include four selectable IF bandwidths, bearing display track & hold, and eight selectable bearing integration times with pulse response down to 35 ms.

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SPECIFICATIONS (subject to change without notice)

DF Technique:	Single-channel Watson-Watt	Track & Hold:	3 sec nominal holding time
Frequency Coverage:	Limited only by host receiver and DF antenna	DF Processing:	Software Defined (FPGA+DSP)
Bearing Accuracy:	0.5° RMS (using 200 milli- second bearing integration)	Ethernet Interface (to host computer):	100Mbps (UDP for I/Q, TCP for ctrl) IP embedded gateway for receiver, GPS, & compass
Bearing Resolution:	0.1°	Power Requirements:	11-16 VDC @ 0.4 ampere (negative ground)
Receiver Signal Interface Format:	3.5 to 52.0 MHz IF, 10.7 MHz (typical)	Over- And Reverse-Voltage Protection:	18 volt shunt power Zener diode with resettable fuse
Receiver IF frequency Configuration:	Software defined in 1 Hz steps	Operating Temp.:	0 to +50 degrees C
IF Signal Input Requirements:	-20 to -130 dBm into 50 ohms (16-Bit direct sample @123 MHz)	Storage Temp.:	-40 to +70 degrees C
IF Bandwidths:	6/15/30/200 kHz	Humidity:	0-95% (no condensation)
Bearing Integration:	35/50/80/100/160/200/275/400 ms	Dimensions:	2.5"x7.0"x6.7" (HxWxD)
		Weight:	3.4 lbs

APPLICATIONS INFORMATION

DF receiving systems traditionally consist of one or more DF antennas connected to a self-contained DF receiver. This DF receiver in turn consists of an appropriate radio receiver (specially designed and carefully aligned to minimize factors that induce bearing errors) having a built-in DF bearing processor and display. Such DF receivers are very expensive (especially those covering wide frequency ranges) due to low-volume production. Furthermore, when the user is faced with new frequency coverage requirements, it is necessary to duplicate this already heavy expenditure to accommodate the new frequency range.

The concept of a DF bearing processor that can work with an external low-cost non-DF host receiver is not new. Most attempts at implementing this concept, however, have yielded DF bearing processors with serious shortcomings. In some instances, they can work only with special receivers built by the same manufacturer. In other cases, intrusive and extensive modifications to the host receiver are required. In general, significant performance degradation must be accepted. Typical performance anomalies include bearing shifts with receiver tuning, IF

bandwidth changes, signal strength, and even as a result of volume control setting changes. In most cases, the resulting DF system is of sub-professional-quality.

The RDF Products Model DFP-1010D has been specifically designed to work in conjunction with the many low-cost wide frequency coverage receivers that have appeared on the consumer market in recent years. By virtue of careful implementation of a particularly suitable DF technique (i.e., the Adcock/Watson-Watt DF technique), the DFP-1010D easily interfaces with almost any receiver to economically provide a professional quality DF system free of the afore-mentioned performance anomalies. New frequency requirements can be easily and economically accommodated simply by purchasing an appropriate DF antenna.

The DFP-1010D replaces the earlier DFP-1010/DFP-1010A/DFP-1010B, employing an all-new modernized design with enhanced features, performance, and versatility unmatched by any single-channel DF processor at any price.

