

# FDC3302e *Frequency Distribution Chassis*

## *High-Performance, 2x10 Autoswitch Distribution Amplifier*

**FDC3302e is a high-performance, dual-input, ten-output, frequency distribution amplifier in a 1U rack-mount chassis.** The FDC3302e (FDC) provides ten isolated copies of a 100 kHz - 30 MHz input signal. Fault sensing of signal levels is provided on all inputs and outputs and status is easily visible via front-panel LED indicators. The FDC is monitored and controlled via a network port and a serial port. Dual power supplies are optionally available to provide the highest reliability for mission critical applications. The FDC is unique in the industry - no other low-cost system offers this combination of capabilities and performance.



### Output Signal Quality

FDC3302e excels at reproducing and preserving the spectral purity of the input signal. Each output channel has a dedicated buffer to minimize additive phase noise and distortion. The input-output circuits are optimized to keep propagation delay low and ensure high isolation between outputs as well as the inputs. Power supply voltages are post-regulated and all output buffers are individually regulated, ensuring very low output spurious noise levels.

### Autoswitching

The FDC's fault-tolerant design supports dual-frequency reference inputs. The health of the input

signals is continuously monitored and if a signal is not present, or the amplitude greatly reduced, it will automatically switch to the other input. This failover feature ensures that your critical signals are always present if one of the inputs become unavailable or its level is compromised.

### Alarm Input

FDC3302e is compatible with the alarm output signal from the Meridian II and Tycho II Precision TimeBase. If one of these time and frequency standards is sourcing the FDC and its alarm output goes active, then the FDC will automatically switch to the backup. To support bank switching, this alarm input may be cascaded to multiple FDC units by simply connecting the inputs with coaxial cable and BNC T-adapters.

### Status Indicators

Front panel LEDs provide you at-a-glance status of the distribution chassis. The FDC provides LED indicators for the power supply(ies), two inputs, all output signals and a summary alarm. The summary alarm is also available as an open-collector output on a rear-panel BNC.

### Control and Status Monitoring

The FDC can be configured and monitored via the network port (SSH) or RS-232 serial port. SNMP monitoring is supported with an Enterprise MIB and traps to interface to a network management system. The web interface is designed with security in mind, so its use is restricted to monitoring status, alarms, and configuration settings. The web interface can be completely disabled for the highest level of security.

### Dual Power Supplies

For the highest level of power source and supply fault-tolerance, the FDC supports dual redundant, AC or DC power supplies. The two power supplies can be any combination of AC/AC, AC/DC, or DC/DC.

### High Reliability

FDC3302e uses EndRun's power-efficient, fanless design and thermal packaging that achieves an estimated MTBF up to 30 years. The system is made in America, backed by a two-year warranty, a 60-day money-back guarantee, and supported by EndRun's top-notch technical support team free of charge!

### FEATURES

- 10-channel, broadband sine wave distribution (100 kHz to 30 MHz).
- Single input or autoswitching between dual inputs.
- Ultra-low additive phase noise.
- Ultra-high port-to-port isolation.
- Ultra-low distortion.
- Ethernet port for remote control, monitoring and SNMP.
- RS-232 port for local control and monitoring.
- Dual-redundant AC or DC power supply options.
- 2-Year Warranty.
- 60-Day Money-Back Guarantee.
- Free technical support for life.



# FDC3302e High-Performance Frequency Distribution Chassis



FDC3302e rear panel view. Shown with optional dual power supplies.

## INPUTS (A and B):

- Frequency Range: 100 kHz to 30 MHz.
- Impedance: 50Ω, SWR <1.1.
- Amplitude: +13 dBm full performance, +2 dBm minimum, +15 dBm maximum.
- A to B Input Isolation: >105 dB.
- Protection: Protected to 24V peak-to-peak.
- Connectors: Rear-panel female BNCs.

## OUTPUTS (1 through 10):

- Impedance: 50Ω, SWR <1.8 @ 100 kHz.  
SWR < 1.2 @ 1 MHz.  
SWR < 1.3 @ 10 MHz  
SWR < 1.8 @ 30 MHz.
- Unity Gain: 0 dB, +/- 2 dB.
- Harmonics: <-40 dBc @ 13 dBm and 100 kHz <= F <= 20 MHz,  
<-35 dBc @ 13 dBm and F > 20 MHz,  
<-30 dBc @ 15 dBm.
- Spurious: <-110 dBc.
- Port-to-Port Isolation: See chart.
- SSB Phase Noise @ 10 MHz and +13 dBm output level\*:  
At 1 Hz <-135 dBc/Hz.  
At 10 Hz <-145 dBc/Hz.  
At 100 Hz <-153 dBc/Hz.  
At 1 kHz <-160 dBc/Hz.  
At 10 kHz <-163 dBc/Hz.  
\* See chart for typical additive phase noise performance.
- Protection: Outputs may be shorted to ground with no damage.
- Connectors: Rear-panel female BNCs.

## EXTERNAL ALARM INPUTS (A and B):

- Normal State: TTL low.
- Alarm State: TTL high or high Z (internal 10k pull-up).
- Connectors: Rear-panel female BNCs.

## ALARM OUTPUT:

- All fault indicators are summed together providing this common alarm output.
- Open Collector, 40 VDC Max, 100 mA max saturation current.
- High impedance when fault condition exists.
- Connector: Rear-panel female BNC.

## NETWORK AND SERIAL I/O PORT:

- 10/100 Base-T Ethernet. IPv4/IPv6, SSH, SNMP (v1,2c,3) with Enterprise MIB, DHCP, HTTPS (Web interface), NTP (client/server), and SYSLOG. Connector: RJ-45 jack.
- RS-232 serial port. User selectable port settings. Default: 19200,8,n,1. Connector: DB9M.

## SYSTEM STATUS INDICATORS:

- Input LEDs: Green when a signal is detected on the input channel. Red when the signal is absent.
- Output LEDs: Green when the output signal is OK and red when a short is detected.
- Power LEDs: Green when the power supply is OK, and red when a fault condition exists.
- Alarm LED: Red when any fault condition exists.
- All fault indicators are summed to provide one common fault.

## POWER:

- 90-264 VAC, 47-63 Hz, 0.5A max. @ 120 VAC.
- 3-Pin IEC 320 on rear panel, 2-meter cord included.

## SIZE:

- Chassis: 1.75"H x 17"W x 10.75"D.
- Weight: < 5 pounds.

## ENVIRONMENTAL:

- Operating Temperature/Humidity: 0° to +50° C / 5% to 90% RH, non-condensing.
- Storage Temperature/Humidity: -40° to +85° C / 5% to 95% RH, non-condensing.

## COMPLIANCE:

- CE, FCC, RoHS, WEEE.

## OPTIONS:

- Dual-redundant AC or DC power supplies. Combinations can be AC/AC, AC/DC, or DC/DC.
- DC power supply: -48, +12, +24/28, or +125 VDC.

## OTHER DISTRIBUTION CHASSIS:

- PDC3301e Pulse Distribution Chassis, TDC3303e Time Code Distribution Chassis

## RELATED TIME AND FREQUENCY STANDARDS:

- Meridian II Precision TimeBase, Tycho II Precision TimeBase

