

## Model DER2018 MultiStar Precision DSP Receiver 20Hz–18GHz

The DER2018 DSP Emissions Receiver offers continuous coverage from 20 Hz to 18 GHz with 140 MHz instantaneous bandwidth. This receiver combines state-of-the-art sensitivity, dynamic range, accuracy and convenience of operation. It complies with CISPR-16-1-1 edition 3.1.

The EMI receiver system includes a built-in computer and interfaces with standard data storage and high resolution video devices. A 23" widescreen flat LED monitor, keyboard and mouse are included.

### Receiver Systems Benefits

Emission Testing Solutions to the following standards:

- MIL-STD-461D, E & F
- DO160D, E & F
- CISPR 11/EN 55011
- CISPR 22/EN 55022
- CISPR 14/EN 55014
- FCC Part 15
  
- 140 MHz-wide, pre-selected, instantaneous bandwidth\*
- PEAK, QUASI-PEAK, AVERAGE, and RMS-AVERAGE detections are processed simultaneously at 8,192 frequency points and interpolated using a proprietary algorithm. These features enable the user to:
  - Display and record detector results as continuous spectra with 1 Hz resolution
  - Scan 4 GHz every second with the PEAK detector, i.e. covering 1 - 18 GHz in 4.25 seconds
  - Sweep 9 kHz - 30 MHz (bands A & B) in 2 seconds with all CISPR detectors
  - Process 30 - 1000 MHz (bands C & D) in 7 seconds with all CISPR detectors
  - Reduce multi-day tasks to minutes
  - Catch short-duration transient disturbances
  - Identify emissions using fast time-base 3-D display
- Easy to use – all functions are **menu driven**.
- Internal wide band calibration source expedites periodic checking and re-calibration of the receiver's amplitude response.
- Capability for user to set up, and save for future use, all of the needed test parameters including limit lines, start/stop frequencies, IF bandwidth, samples per bandwidth, dwell time at each frequency, input port selection vs. test frequency, transducer correction table, input attenuation, units to be used for the displayed level units, and more.



*\*140MHz instantaneous bandwidth is available in bands C, D and E with -6dB resolution bandwidth  $\geq$  50kHz. The entire bands A and B are covered instantaneously with -6dB bandwidths at least 100Hz and 9kHz respectively. With narrower resolution bandwidth settings, the instantaneous bandwidth is proportionally reduced.*

**SPECIFICATIONS, DER2018**

*All references to CISPR specification are to CISPR-16-1-1 edition 3.0 2010-01*

*All references to MIL-STD specification are to MIL-STD-461 D, E & F*

*Definitions: ADNL = Average displayed noise level, PDNL = Peak displayed noise level*

**PARAMETER.....SPECIFICATION**

**FREQUENCY RANGE**

DER2018 Base System.....20 Hz–18 GHz  
 With CFE1840 antenna mountable down-converter .20 Hz–40 GHz (See CFE1840 spec sheet)

**MODES OF OPERATION: Spectrum Analyzer Modes**

Free running  
 Single sweep  
 Video, software and external trigger

**MODES OF OPERATION: Time Domain Analyzer Modes**

Single Frequency  
 Single instantaneous sub-band  
 Free running  
 Single shot  
 Video, software and external trigger

**FREQUENCY RESOLUTION (Display & Markers).....1 Hz**

**DIGITALLY PROCESSED IF FILTERS .....GAUSSIAN-SHAPED, -6dB or -3dB Bandwidths selectable**

20 Hz–30 MHz.....Any bandwidth in the range 10 Hz -350 kHz  
 30 MHz–18 GHz.....Any bandwidth in the range 50 Hz -1.7 MHz  
 18 GHz–40 GHz (with CFE1840 down-converter)....Any bandwidth in the range 50 Hz -1.7 MHz

**LEVEL MEASUREMENT UNCERTAINTY ..... ±1.0 dB (95% uncertainty interval)**

**STABILITY OF INTERNAL FREQUENCY STANDARD**

Initial setting .....±0.2 ppm  
 Over operating temperature range .....±0.4 ppm  
 First year.....±0.5 ppm  
 First ten years.....±2.0 ppm

**SENSITIVITY & DYNAMIC RANGE (0dB input attenuation, -6dB resolution bandwidths, Preamp OFF)**

Frequency Range (MHz)	Resolution Bandwidth (kHz)	ADNL (dBm) (typical)	PDNL (dBm) (max., incl. spurious)	Typical Overload Range (dBm)
30 Hz–1 kHz	0.01	-110	-92	-1 to +2
10 kHz–30 MHz	0.01	-140	-92	-1 to +2
1 kHz–10 kHz	0.1	Linear slope: -90 @ 1kHz -125 @ 10kHz	Linear slope: -85 @ 1kHz -115 @ 10kHz	-1 to +2
9 kHz–150 kHz	0.2	-129	-100	-1 to +2
10 kHz–150 kHz	1	-122	-100	-1 to +2
150 kHz–30 MHz	9 or 10	-112	-92	-1 to +2
30–300 MHz	100 or 120	-100	-82	-1 to +8
300–1,000 MHz	100 or 120	-100	-82	-7 to +2
1–6 GHz	1,000	-97	-78	-8 to +2
6–18 GHz	1,000	-90	-69	-4 to +9

**SENSITIVITY & DYNAMIC RANGE (0dB input attenuation, -6dB resolution bandwidths, Preamp ON)**

Frequency Range (MHz)	Resolution Bandwidth (kHz)	ADNL (dBm) (typical)	PDNL (dBm) (max., incl. spurious)	Typical Overload Range (dBm)
30–300 MHz	100 or 120	-118	-104	-30 to -21
300–1,000 MHz	100 or 120	-118	-100	-38 to -30
1–6 GHz	1,000	-111	-98	-37 to -27
6–18 GHz	1,000	-111	-93	-37 to -16

1dB COMPRESSION POINT .....Above overload level

**THIRD ORDER INTERCEPT POINT**

(0 dB input attenuation, CW signals) .....Typically 10dB above overload level

**DETECTORS AVAILABLE IN BOTH SPECTRUM ANALYZER AND RECEIVER MODES**

PK, MIL-STD Peak hold  
PK, CISPR Peak hold  
QP, AVG, RMS-AVG, CISPR weighting and filtering. All detectors displayed simultaneously.

**DETECTORS ADDITIONALLY AVAILABLE IN TIME DOMAIN ANALYZER MODES**

AM

**PRESELECTION**

Bands A, B ..... 20 Hz - < 30 MHz  
Band C #1 ..... 30 MHz - < 160 MHz  
Band C #2 ..... 160 MHz - < 300 MHz  
Band D #1 ..... 300 MHz - < 440 MHz  
Band D #2 ..... 440 MHz - < 580 MHz  
Band D #3 ..... 580 MHz - < 720 MHz  
Band D #4 ..... 720 MHz - < 860 MHz  
Band D #5 ..... 860 MHz - < 1000 MHz  
Band E #1 ..... 1 GHz - < 6 GHz  
Band E #2 ..... 6 GHz - 18 GHz  
Band K (with CFE1840 Down-converter) ..... 18 GHz - < 26.5 GHz  
Band Ka (with CFE1840 Down-converter) ..... 26.5 GHz - 40 GHz

**IMAGE REJECTION (0 dB input attenuation)** ..... > 95 dB, CISPR limit > 40 dB (par 4.5.3)

**IF REJECTION (0 dB input attenuation)** ..... > 95 dB, CISPR limit > 40 dB (par 4.5.2)

**RF INPUTS (Selectable, 50 Ohm, unbalanced, front panel)**

Regular RF input  
Remote LN1G18 Pre-amp input with DC Bias  
CFE1840 Down-converter input

**MAX DC VOLTAGE AT ANY RF INPUT** ..... 0 VDC maximum

**INPUT ATTENUATOR** ..... 20 Hz–18 GHz, 0–75 dB in 5 dB steps

**CALIBRATED WIDE BAND NOISE OUTPUT (Front panel) – used in cable and external pre-amp calibration**

1-18 GHz ..... ENR = 24 dB (nominal)

**OPERATING SYSTEM & PROCESSOR** ..... Microsoft Windows XP Professional, Intel i5 Processor (Quad Core, 2.66GHz)

**DATA STORAGE** ..... Internal 24X DVDRW and 500+ GB Hard Drive (HDD) (hot swappable drive, standard)

**INTERFACES** ..... 10 USB ports (2 front panel, 8 rear panel); IEEE–1394a; 10/100/1000Mbps LAN, IEEE-488.

**VIDEO OUTPUT (to display)** ..... DVI/VGA (up to 2560 x 1600 @ 60 Hz)

**DATA PROCESSING** ..... User defined limit lines and transducer correction tables.  
Saves original measured data for later processing with different correction tables.

**TRANSIENT LIMITER (accessory)** ..... Attenuates power line frequencies and harmonics.  
Attenuation: 10 dB ±0.5 V, 9 kHz to 100 MHz.

**TEMPERATURE RANGE** ..... 0°C to 60°C

**SIZE (W x H x D)**

[excludes display and accessories] ..... 50.2 x 25.6(5U) x 68.2 cm, 19.75 x 10.06(5U) x 26.87 in

**WEIGHT (approximate)** ..... 41 kg (90 lbs) includes display and accessories

**PRIMARY POWER** ..... 100-240VAC, 47-63 Hz, single phase, 1000 VA max with included display (23 inch LED monitor), keyboard and mouse

**EXPORT CLASSIFICATION** ..... 3A002 C.4. These commodities, technology or software are controlled for export in accordance with the U.S. Export Administration Regulations. Diversion contrary to U.S. law is prohibited.

