

# C911 (2-Channels) FFT Data Collector, Signal Analyzer with Bearing Condition & Balancing

The C911 offers a high performance 6400 lines, extra power and convenience of two-channel FFT data measurement and signal analysis by two accelerometers. It can be used in almost every industrial maintenance for quick monitoring and FFT signal diagnosis of machine condition. It also allows correction of dynamic imbalance machine with up to 8-planes mode. The analyzer is compact and weight around 800 gram. It is also IP 65 rugged housing with silicon protector to withstand for harsh environment.

The option of add-on laser alignment capability delivers a premium return on investment for C911-SA model.

### C911 key feature includes:

- Overall values measurement Acceleration, Displacement & Velocity mode
- Time domain
- 32kHz FFT spectrum diagnosis (amplitude & enveloping)
- Bearing condition monitoring
- Balancing up to 8-planes
- RPM measurement
- Laser shaft alignment (optional)

### Applications:

- Power generation
- Pulp & paper
- Petrochemical
- Oil & gas
- Pharmaceutical
- Processing industries
- Desalination plants
- Water Filtration Plants
- Shipping vessel
- Engineering services
- etc...



With C911, the automatic condition monitoring, signal analysis and expandable laser alignment capability has never been handy and convenient to maintenance personnel.

## TECHNICAL SPECIFICATIONS C911

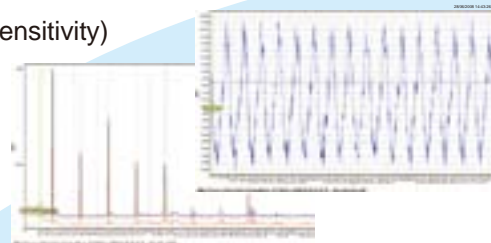
### Measurement Channels

- 2 analog channels – charge mode amplifier (programmable sensitivity)
- 1 bearing probe / envelope detector input 1 tachometer input
- 2 (S, M) transducer input

### Sample of Bearing Report

Date/Time	Tunings			Measurements		Results of diagnostics, recommendations	Bearing	Oil
	N (rpm)	Outer diam	Init level	dBm	dBc			
<b>Mazak/Production Flr/Good Stk/0514 095219</b>								
5/14/2007 10:24:00 A	200	80	7	24	16	The generation of defects of bearing. Satisfactory condition of lubricant. Partial additive of lubricant.	☹️	☹️
5/14/2007 10:27:04 A	1000	65	20	12	8	Good state of bearing, Good state of oil.	😊	😊
5/14/2007 10:29:56 A	2000	65	26	11	6	Good state of bearing, Good state of oil.	😊	😊
5/14/2007 10:31:28 A	5000	65	34	11	7	Good state of bearing, Good state of oil.	😊	😊
<b>Mazak/Production Flr/Suspected Stk/0514 105401</b>								
5/14/2007 10:56:06 A	200	80	7	22	14	The generation of defects of bearing. Satisfactory condition of lubricant. Partial additive of lubricant.	☹️	☹️
5/14/2007 10:57:34 A	1000	80	21	25	20	The generation of defects of bearing. Satisfactory condition of lubricant. Partial additive of lubricant.	☹️	☹️
5/14/2007 10:58:46 A	2000	80	27	25	20	The generation of defects of bearing. Satisfactory condition of lubricant. Partial additive of lubricant.	☹️	☹️
5/14/2007 11:00:30 A	5000	80	35	35	30	Significant defects.	☹️	☹️
5/14/2007 11:02:08 A	5000	65	34	27	23	The generation of defects of bearing. Satisfactory condition of lubricant. Partial additive of lubricant.	☹️	☹️
5/14/2007 11:03:52 A	3000	65	20	22	19	The generation of defects of bearing. Satisfactory condition of lubricant. Partial additive of lubricant.	☹️	☹️
5/14/2007 11:04:48 A	2000	65	26	21	16	The generation of defects of bearing. Satisfactory condition of lubricant. Partial additive of lubricant.	☹️	☹️
5/14/2007 11:05:16 A	1000	65	20	24	20	The generation of defects of bearing. Satisfactory condition of lubricant. Partial additive of lubricant.	☹️	☹️

Indications: 😊 - good; ☹️ - satisfactory; ☹️ - bad; ☹️ - dangerous;



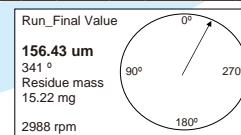
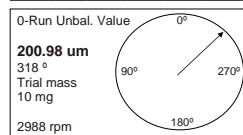
The ConSpect software allow user to create A, V, S data report, FFT Spectrum and also trending result report

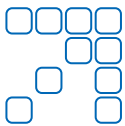
### Sample C911 - Balancing Report

Company:	Laser Technology
Site:	Mittel Incineration Plant
Machine Config.:	Blower
Number:	MB 223
Speed:	1500 rpm
Power:	50Kw
Bal. By:	J. M
Remarks:	

File name: BBC\_Power plant /trial bal/BALANCE/BB (2008/06/07 11:34:18 - Balancing)  
Measured unit for amplitude and weights: um & mills grams

Plane	Point	0_Run		Trial_Run		Initial Wght Info	Compens. Value		Influe. Coefficient		Corr. Values		Corrected Wght Info		Run_Final Value		
		Amp	Deg	Amp	Deg		Wght	Desq	Amp	Deg	Amp	Deg	Amp	Deg	Wght	Desq	Amp
1	1	200.98	318°	269.73	351°	10		200.80	318°	11.69	69°	33.32	275°	15.22	85°	156.43	341°
1	2	107.46	349°	152.91	22°			107.46	349°	8.59	65°	45.39	100°				





# C911 (2-Channels) FFT Data Collector, Signal Analyzer with Bearing Condition & Balancing



## TECHNICAL SPECIFICATIONS

### Device Measurement range / Accuracy

RPM 10...20 000 rpm /  $\pm 1^\circ$  /  $\pm 1$ rpm  
 Displacement 5000  $\mu$ m (p-p) /  $\pm 2\%$   
 Velocity 1000 mm/s (rms) /  $\pm 2\%$   
 Acceleration 1000 m/s<sup>2</sup> (peak) /  $\pm 1\%$

### FFT Spectrum

Fmin 2Hz  
 Fmax 125 Hz ... 35 kHz, selectable  
 Lines 100 ... 6400  
 Window Rectangular and Hanning

### Operating modes

Vibration:

- Overall values: vibration (acceleration, velocity, displacement), shock pulse (roller bearing condition), RPM
- Signals: FFT spectrum (amplitude, envelope), time-signal.

Balancing - Dynamic balancing up to 8 planes, max.14 points.

Tachometer – Speed.

Alignment - Optional program for C911-SA model.

### Memory

System flash memory 2MB  
 Data file storage capacity >1000 files  
 2GB SD card (or micro, mini SD with adaptor),  
 Standard file system (FAT).  
 USB interface, "mass storage device".

### Display

Graphic LCD w/ back-lite

### Supply

NiMH, exchangeable (4.8V / 2.1Ah).  
 Device. charge time < 3 hours  
 Operating duration.> 8 hours of 50% usage

### Temperature range

Storage -20°C to 70°C  
 Operation -10°C to 55°C

### Relative humidity

10 ... 90%

### Protection class

IP65, chassis with silicon protector against drop shock.

### Carrying Case - No. 1

Package weight & dimensions  
 Approx. 456 x 355 x 133mm  
 Package Gross weight 6 kg (excludes SA components)

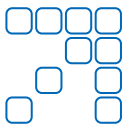
### Standard Delivery C911 Package Components

- C911 Analyzer w/built-in rechargeable battery
- Accelerometer, 2pcs
- Accelerometer magnetic stud, 2pcs
- Accelerometer measuring tip, 2pcs
- Tachometer w/3m cable attached
- Luminous marker
- Magnetic mounting stand for tachometer
- Bearing condition probe w/ cable attached
- USB PC com cable, 1.5m
- AC charger, 230V/50Hz
- ConSpect PC software & operating manual in CD-ROM
- Calibration & Quality certificates
- ABS carrying case (1) w/ form inserted

Characteristic frequencies FFT spectrum

Defect	Frequency	Amplitude	Threshold exceeding limit with Advice
Outer ring roll f <sub>sp</sub> =	19.65	17.56	Insignificant defects
Heterogeneous radial stretch 2*f <sub>sp</sub> =	39.31	0.05	Defects are not detected
Outer ring skew 2*f <sub>H</sub> =	104.81	0	Defects are not detected
Outer ring deterioration f <sub>H</sub> =	52.40	0	Defects are not detected
Bubbles (splits) on outer ring f <sub>H</sub> =	52.40	0	Defects are not detected
Inner ring deterioration f <sub>sp</sub> =	19.65	17.56	Insignificant defects
Bubbles (splits) on inner ring f <sub>B</sub> =	90.51	0	Defects are not detected
Balls and separator deterioration f <sub>C</sub> =	7.49	0	Defects are not detected
f <sub>sp-fc</sub> =	12.93	0	Defects are not detected
Bubbles (splits) on balls f <sub>rx</sub> =	5.56	0	Defects are not detected
Roll surfaces defects f <sub>H+fB</sub> =	142.92	0	Defects are not detected
f <sub>H-fB</sub> =	72.82	0	Defects are not detected
(f <sub>sp-fc</sub> )*(z+1) =	103.45	0	Defects are not detected
Ring sliding in place f <sub>sp</sub> =	19.65	17.56	Insignificant defects





# C911-SA (2-Channels) FFT Data Collector, Signal Analyzer with Bearing Condition & Balancing + Laser Alignment



**SAVE TIME AND MONEY WITH 4 IN 1 !**

C911-SA - a simple compact, reliable and affordable system for all rotating equipment. It offers the benefits of data collection, signal analysis, balancing and dynamic precision laser shaft alignment on machinery with minimal waste of time and without stretching the budget.

Proper alignment eliminates the leading cause of machine breakdown and pays for itself! Diminishes the cost of spare parts and production lost due to downtime!

SA model makes quick, accurate shaft alignment a simple task for all new alignment users! The system is designed of easy in use and user-friendly interface!



## ADDITIONAL ALIGNMENT PROGRAMS AND USEFUL FUNCTIONS

### HORIZONTAL-

Alignment of horizontal machines train by any position of 9,12,3 or 6'clock, or min. 60° rotation angle mode.

### VERTICAL-

For the alignment of vertical and flange-mounted machines by any position of 9,12,3 or 6'clock.

### SOFT FOOT-

Step by step to check that the machine is properly standing on all feet and remove "soft-foot" step by step if occur.

### THERMAL GROWTH-

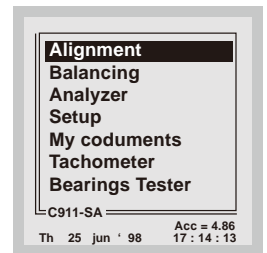
Input of cold coupling target for the thermal alignment compensation, considering difference in thermal growth between machines.

### ALIGNMENT SHIM SIMULATOR-

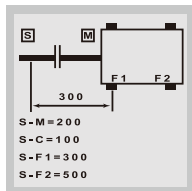
Shims simulation function that allows to check the possibility of use of the present shims in case they differ from the results of the calculations.

### MY DOCUMENTS-

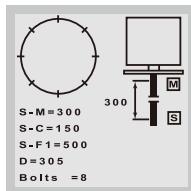
Versatile PC compatible file system (FAT) ► allows to organize data file management and report print. Expanable memory of 1GB in "B" drive.



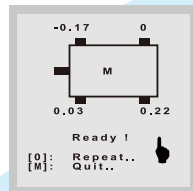
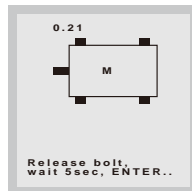
### HORIZONTAL ALIGNMENT



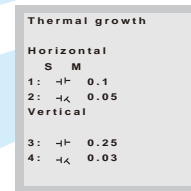
### VERTICAL ALIGNMENT



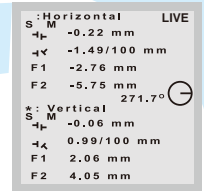
### SOFT FOOT CHECK



### THERMAL GROWTH COLD TARGET

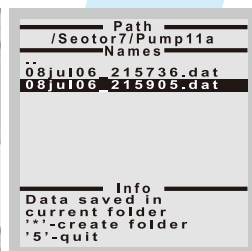


### DYNAMIC ICON

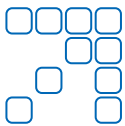


## MY DOCUMENTS

Versatile PC compatible file system (FAT) - and Windows base "Conspect" software - allow more than 500 date save within device and upload to PC via USB communication for report print and PC alignment database management.







# C911-SA (2-Channels) FFT Data Collector, Signal Analyzer with Bearing Condition & Balancing + Laser Alignment



## TECHNICAL SPECIFICATIONS

### Measuring Transducer units (S, M)

Housing material	Light weight alloy aluminum
Environmental protection	IP65 (water spray resistant, shock and dustproof)
Operating temperature	-20°C to 55°C
Laser	Diode laser
Laser wavelength	635-670nm, visible red light
Laser safety	Class II
Resolution	0.001mm
Detectors	2-axis 10x10mm PSD
Electronic inclinometer	0.1° resolution
Dimensions	Approx. 64x58x45mm
Measurement distance	up to 10m
Weight	(M) & (S) 235g

### Control Display unit

Housing	Light weight alloy aluminum
Environmental Protection	IP65 (water spray resistant, shock and dustproof)
Operating temperature	0°C to 55°C
Type of display	Backlit dot matrix LCD
Display size	61x61mm
Max. displayed error	+1% +1digit
Displayed resolution	0.01mm, 0.001mm
Rechargeable battery	4 x 1.2V NiMH
Output interface	High speed USB port
Keyboard	Membrane alphanumeric 17 key
Memory capacity	2MB + Storage 2GB
Dimensions	Approx. 170x110x40mm
Weight	600g

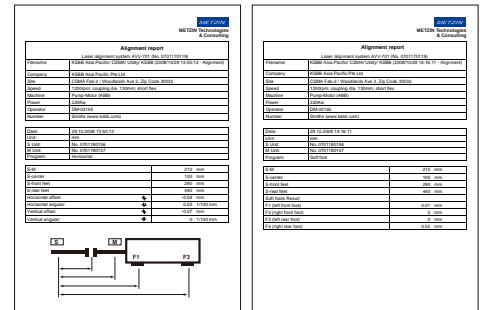
### Carrying Case - No.2

Standard	ABS with form inserted
Package weight & dimensions	Approx. 456 x 355 x 133mm
Weight incl. all std parts	7.3Kgs (SA model)

**Standard Delivery:** Extra components for SA model.

### Optional C911-SA add-on Laser Alignment Components

1. AVV-701 measuring transducer units (S,M), 2pcs
2. Transducer cable (3m), 2pcs
3. Compact chain bracket frame, 2pcs
4. Compact chain, 300mm & 600mm, 2ea.
5. Support posts 135mm & 300mm, 4pcs each
6. Measuring tape, mm
7. Maker Calibration & Quality certificate
8. ABS carrying case (2) w/ form inserted



### Options:

- KB-8003-Bolt hole bracket
- KB-8004-Offset adaptor
- KB-8006-Compact magnetic bracket for rotate & non-rotate shaft.
- KB-8011P-Short support post 60mm, 2pcs
- L100-XP-Stainless steel 304 precut shims package



METZ™ Pre-cut Shims

304 Stainless steel ABCD sizes complete with case package

### Representative:

