MS9740A-009
Multimode fiber interface
(50/62.5 μm)
Operation Manual

Second Edition

- **For safety and warning information, please read this manual before attempting to use the equipment.**
- **Additional safety and warning information is provided within the MS9740A Optical Spectrum Analyzer Operation Manual. Please also refer to this document before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

MS9740A-009

Multimode fiber interface (50/62.5 μm)

Operation Manual

3   September 2010 (First Edition)
10   November 2011 (Second Edition)

Manual Change

The MS9740A-009 is a modified option of the MS9740A.

The following table shows the differences between the MS9740A-009 and the MS9740A.

Refer to the "MS9740A Operation Manual" (W3328AE) for further information.

Manual Change from MS9740A Optical Spectrum Analyzer Operation Manual

Section	Page	MS9740A	MS9740A-009	Description
1.1.2	1-4	Basic features: ・Supports both single mode (SM) and multimode (MM) fibers (50/125 μm)	Basic features: ・Supports both single mode (SM) and multimode (MM) fibers (62.5/125μm, 50/125μm) The NA of multimode fiber for 50/125μm and 62.5/125μm is 0.2 and 0.275, respectively. However, the acceptable NA is 0.1 under the limitations of the spectroscope.	
		・High wavelength accuracy of ±20 pm (WDM wavelength band, Light Source option for wavelength calibration)	N/A	
		・Dynamic range of 42 dB (0.2 nm from peak wavelength) and 70 dB (1 nm from peak wavelength) (in High Dynamic Mode)	・60 dB (0.5 nm from peak wavelength) and 70 dB (1 nm from peak wavelength) (in High Dynamic Mode) dynamic range	
		・High resolution of 0.03 nm (1550 nm band)	N/A	
2.1.1	2-2	Table 2.1.1-2	(The following are added.) MS9740A-009 Multimode fiber interface (50/62.5 μm)	
2.7	2-13	The following optical fibers can be used with this equipment: ・Single-mode fiber (SM) (core diameter of 5 to 9.5 μm) ・Multimode fiber (GI) (core diameter of 50 μm)	The following optical fibers can be used with this equipment: ・Single-mode fiber (SM) (5 to 9.5 μm core diameter) ・Multimode fiber (GI) (50 μm core diameter) ・Multimode fiber (GI) (62.5 μm core diameter)	

Manual Change from MS9740A Optical Spectrum Analyzer Operation Manual (Cont'd)

Section	Page	MS9740A	MS9740A-009	Description
2.7	2-13	When using SM fiber, press **F1 Measure Mode** and set **f5 MM Mode** to Off. When using GI fiber, press **F1 Measure Mode** and set **f5 MM Mode** to On. The performance is limited depending on the fiber used.	N/A	
2.7	2-13	(1) Limitations on wavelength resolution	N/A	
2.7	2-16	Using Multimode (MM) fiber (50 μm core diameter)	N/A	
3.1.3	3-9	3.1.3 Calibrating Resolution	N/A	
3.5.2	3-15	2. Enter the resolution using **f 1** through **f 7**.	2. Enter the resolution using **f 1** through **f 5**.	0.03 nm and 0.07 nm are not avilable.
4.3	4-8	To set resolution（Res）： 1. Press **f1 Res**. 2. Select the value from **f1** to **f7**.	To set resolution（Res）： 1. Press **f 1 Res**. 2. Select the value from **f 1** to **f 5**.	0.03 nm and 0.07 nm are not avilable.
4.7	4-25	The spectrum measurement modes are listed below. ・Multi-mode fiber mode (MM Mode)	N/A	Multi-mode fiber mode is deleted.
4.7	4-25	Figure 4.7-1 Multi mode fiber measurement indication	N/A	"MM Mode On" is not displayed.
4.7	4-27	To set Multimode Fiber Mode (MM mode)	N/A	The opearation of the MM mode is invalid.
4.7	4-28	To release MM Mode	N/A	The opearation of the MM mode is invalid.

Manual Change from MS9740A Optical Spectrum Analyzer Operation Manual (Cont'd)

Section	Page	MS9740A	MS9740A-009	Description
A.1	A-1	Configuration -Option- MS9740A-001/101 GPIB Interface MS9740A-002/102 Light Source for Wavelength Calibration	Configuration -Option- MS9740A-001/101 GPIB Interface MS9740A-002/102 Light Source for Wavelength Calibration MS9740A-009 Multimode fiber interface (50/62.5 µm)	
A.1	A-2 to A-4	Optical characteristics	Change table in page 4 through 6	
A.2	A-6		(The following are added.) W3431AE MS9740A-009 Multimode fiber interface (50/62.5 µm) Operation Manual (Manual Change)	Printed, English

Table A.1-1   MS9740A-009 Specifications

Item		Specifications
Optical characteristics		Optical fiber: SM (ITU-T G.652), GI (50/125 μm) , GI (62.5/125 μm) PC Connector SM (ITU-T G.652), GI (50/125 μm) :reflection attenuation 40 dB or more GI (62.5/125 μm) : :reflection attenuation 38 dB or more *SM/GI fiber described below means this specified fiber. After warming up for at least 2 hours after power-on (the Repeat sweeping performed at Span 100 nm or more and VBW 10 kHz or more during the warm-up operation) and performing automatic adjustment of optical axis, with wavelength calibration (hereafter, WI Cal), and constant temperature

	Wavelength	Wavelength range: 600 nm to 1750 nm
		Wavelength sweep width: 0.2 nm to 1200 nm, 0 nm
		Wavelength accuracy:
		     After Wl Cal (Ext) execution
		      600 to 1750 nm: ±300 pm
		    When installing the light source for wavelength calibration (option):
		Within 1 hour after Wl Cal and ±3°C temperature variation using SM fiber after Wl Cal (Ref) (after calibration with EELED light source option)
		     1530 to 1570 nm, Resolution 0.07 nm to 0.2 nm: ±50 pm
		     1530 to 1570 nm, Resolution 0.5, 1.0 nm: ±100 pm
		
		Wavelength stability:
		    ±5 pm or less
		Wavelength linearity
		    N/A

	Resolution	Setting resolution
		   0.07, 0.1, 0.2, 0.5, 1.0 nm
		
		Resolution accuracy
		Using SM fiber after Res-Cal at 633 nm, 1310 nm, 1550 nm
		    Resolution 0.1 nm: ±30%
		    Resolution 0.2 nm: ±15%
		    Resolution 0.5 nm: ±7%

Table A.1-1   MS9740A-009 Specifications (Cont'd)

Item		Specifications
Optical characteristics		
	Level	Level measurement range:
		VBW = 10 Hz, Sweep average = 10, Resolution= 0.07 nm or more (when using SM fiber)
		When optical attenuation is Off:
		5° to 30°C
		600 to 1000 nm: –65 to +10 dBm
		1000 to 1250 nm: –85 to +10 dBm
		1250 to 1600 nm: –90 to +10 dBm
		1600 to 1700 nm: –75 to +10 dBm
		1700 to 1750 nm: –55 to +10 dBm
		30° to 45°C
		600 to 1000 nm: –60 to +10 dBm
		1000 to 1250 nm: –80 to +10 dBm
		1250 to 1600 nm: –85 to +10 dBm
		1600 to 1700 nm: –70 to +10 dBm
		1700 to 1750 nm: –50 to +10 dBm
		When optical attenuation is On:
		5° to 30°C, 1100 to 1600 nm: –70 to +23 dBm
		30° to 45°C, 1100 to 1600 nm: –65 to +23 dBm
		Level accuracy:
		±0.6 dB
		At min. setting resolution of 0.2 nm with –10 dBm input, using SM fiber (master FC connector) with wavelength of 1310 or 1550 nm and 23° ±5°C
		Level stability:
		±0.1 dB
		During 1-minute period at min. setting resolution of 0.2 nm with –23 dBm input, using SM fiber with wavelength of 1550 nm, no change in polarization
		Level Linearity:
		When optical attenuation is Off: ±0.1 dB (Using SM fiber with wavelength of 1550 nm at –50 to 0 dBm)
		When optical attenuation is On: ±0.1 dB (Using SM fiber with wavelength of 1550 nm at –30 to +20 dBm)
		Level flatness:
		N/A
		Polarization Dependency:
		N/A

Table A.1-1   MS9740A-009 Specifications (Cont'd)

Item		Specifications
Optical characteristics		
	Dynamic range	High Dynamic range mode: With optical attenuator Off, at setting resolution of 0.07 nm and wavelength of 1550 nm (when using SM fiber)

High Dynamic range mode table:

	Temprature	
	20° to 30°C	5° to 45°C
At ±1 nm from peak wavelength	70 dB	65 dB
At ±0.5 nm from peak wavelength	60 dB	55 dB

Normal dynamic range mode:
    With optical attenuator Off, at setting resolution of 0.07 nm and wavelength of 1550 nm (when using SM fiber)

	Temprature	
	20° to 30°C	5° to 45°C
At ±1 nm from peak wavelength	62 dB	57 dB
At ±0.5 nm from peak wavelength	58 dB	53 dB

Item		Specifications
	Reflection attenuation	32 dB or more Using SM fiber with wavelength of 1310 nm and 1550 nm