



FIBER OPTICAL SYSTEM

S-FWXXXXX-091821-X

SPARKS FIBER OPTICAL REPEATER SYSTEMS tackle indoor and outdoor coverage challenges by employing a master unit (MU) and a remote unit (RU). The MU obtains signal resources directly from the base station, optically transmitting the signal to the RU situated in a different area. This process enhances signal strength in areas with weak or no signal.

SPARKS products are crafted from robust materials, ensuring durability and stable performance.

Sparks 光纖增波器系統透過採用主單元 (MU) 和遠端單元 (RU) 來應對室內和室外覆蓋挑戰。MU 直接從基地台取得訊號資源，將訊號光傳送到位於不同區域的RU。此過程可增強訊號弱或無訊號區域的訊號強度。

SPARKS 產品採用堅固的材料製成，確保耐用性和穩定的性能。

MU



RU



20dBm



27dBm



33dBm



37dBm

Features

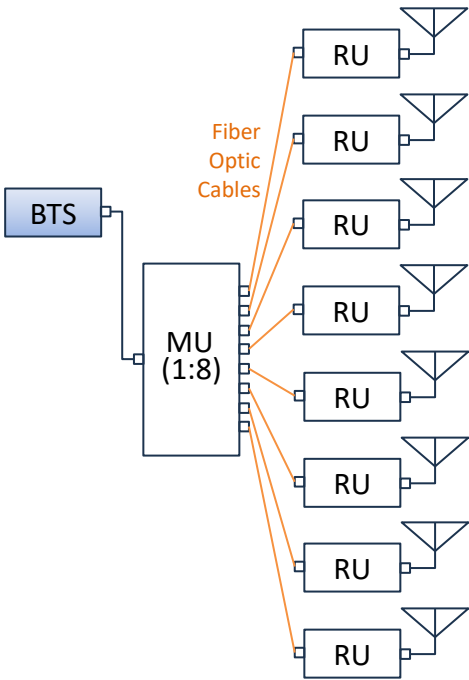
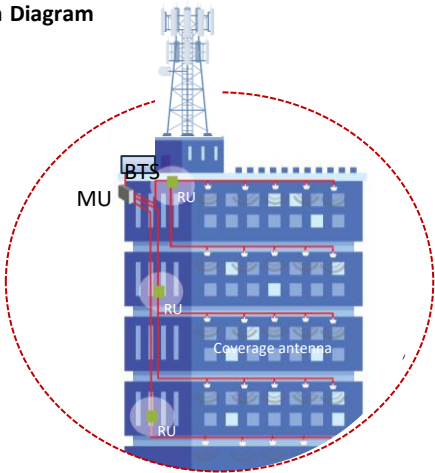
- MU:RU configuration is 1:4 / 1:8 / 1:16 star topology. MU:RU 配置為 1:4 / 1:8 / 1:16 星形拓模。
- RU Maximum 20 / 27 / 37dBm output power. RU 最大20/27/37dBm輸出功率。
- FDD-LTE 1800,FDD-NR 2100 and TDD-NR 3500. 支援FDD-LTE 1800,FDD-NR 2100 and TDD-NR 3500。
- LCD screen of human-computer interaction interface, displaying real-time equipment working status.人機互動介面液晶螢幕，顯示即時設備工作狀態。
- Remote monitoring function via LTE wireless modem.透過 LTE 無線數據機進行遠端監控功能。
- Supporting multi-operator application with full system bandwidth. 全系統寬頻支援多家電信業者。

System Products

Schematic Diagram

Master Unit (MU) 1:4	S-FWM40-091821-4
Master Unit (MU) 1:8	S-FWM40-091821-8
Master Unit (MU) 1:16	S-FWM40-091821-16
Remote Unit (RU) 20dBm	S-FWR4020-091821
Remote Unit (RU) 27dBm	S-FWR4527-091821
Remote Unit (RU) 33dBm	S-FWR5033-091821
Remote Unit (RU) 37dBm	S-FWR5537-091821

Installation Diagram



Tri Band

FIBER OPTICAL SYSTEM

S-FWXXXXX-091821-X

Specifications

1:4 Master Unit (MU) : S-FWM40-091821-4

MU



正面

背面

Electrical Parameters 電性參數		900MHz	1800MHz	2100MHz
Uplink Frequency Range 上行頻率範圍	MHz	885-915	1710-1785	1920-1980
Downlink Frequency Range 下行頻率範圍	MHz	930-960	1805-1880	2110-2170
Operating Mode 工作模式		FDD-LTE	FDD-LTE	FDD-NR
Operating Bandwidth 工作頻寬	MHz	30	75	60
RF Output Power (Uplink) 上行射頻輸出功率	dBm	23±2	23±2	23±2
Uplink Gain 上行增益	dB	40±3	40±3	40±3
Downlink Gain 下行增益	dB	40±3	40±3	40±3
Manual Gain Control (1dB step) 手動增益控制 (全頻帶調整每階 1dB)	dB	0-31	0-31	0-31
Max. No Damage RF Input Power (Downlink) 無損壞最大下行射頻輸入功率	dBm	-10	-10	-10
Pass Band Ripple (p-p) 通過頻帶波紋	dB	≤±4	≤±4	≤±4
EVM 誤差向量幅度	%	≤8	≤8	≤3.5
Frequency Stability 頻率穩定度	ppm	≤0.01		
Noise Figure (1x RU: MU) 雜訊指數 (1x RU: MU)	dB	≤5		
System Delay 系統延遲	μsec	≤3		
VSWR 駐波比		≤1.5		
Spurious Emissions 混附波輻射		Comply with 3GPP TS36.106 & TS38.106		
Spectrum Emission Mask 混附波輻射波罩		Comply with 3GPP TS36.106 & TS38.106		
Optical Output Power (Downlink) @1550 nm 下行輸出光功率@1550 nm	dBm	-3±3		
Optical Receiver Sensitivity (Uplink) @1310 nm 上行光接收靈敏度@1310 nm	dBm	-15		

Mechanical Parameters 機械參數		
Dimensions, H x W x D 尺寸	mm	Standard 19" 2U
Weight (approx.) 重量	kg	7
Power Supply 電源		AC100~240V, Comply with EN60950
Power Consumption (approx.) 消耗電功率	W	≤45
RF Connectors 射頻接頭		1*N-Female or 4.3-10-Female, 50Ω (customizable)
FO Connectors 光接頭		4* LC/SC/FC - UPC/APC (customizable)
Local Control 本地控制		LCD+Keypad & Wi-Fi via Web Browser USB-C/RJ45 (customizable)
OMC 連接網管方式		Via Wi-Fi or LTE Wireless Modem
Operating Temperature 工作溫度	°C	-10 to +55
Operating Humidity 工作濕度	%	≤95
Ingress Protection 異物防護等級		IP40, Indoor
Installation Type 安裝方式		19" Rack or Wall Mount
MTBF 平均故障間隔時間	Hours	≥50000



Tri Band

FIBER OPTICAL SYSTEM
S-FWXXXXX-091821-X

Specifications

1:8 Master Unit (MU) : S-FWM40-091821-8

MU



正面

背面

Electrical Parameters 電性參數		900MHz	1800MHz	2100MHz
Uplink Frequency Range 上行頻率範圍	MHz	885-915	1710-1785	1920-1980
Downlink Frequency Range 下行頻率範圍	MHz	930-960	1805-1880	2110-2170
Operating Mode 工作模式		FDD-LTE	FDD-LTE	FDD-NR
Operating Bandwidth 工作頻寬	MHz	30	75	60
RF Output Power (Uplink) 上行射頻輸出功率	dBm	23±2	23±2	23±2
Uplink Gain 上行增益	dB	40±3	40±3	40±3
Downlink Gain 下行增益	dB	40±3	40±3	40±3
Manual Gain Control (1dB step) 手動增益控制 (全頻帶調整每階 1dB)	dB	0-31	0-31	0-31
Max. No Damage RF Input Power (Downlink) 無損壞最大下行射頻輸入功率	dBm	-10	-10	-10
Pass Band Ripple (p-p) 通過頻帶波紋	dB	≤±4	≤±4	≤±4
EVM 誤差向量幅度	%	≤8	≤8	≤3.5
Frequency Stability 頻率穩定度	ppm	≤0.01		
Noise Figure (1x RU: MU) 雜訊指數 (1x RU: MU)	dB	≤5		
System Delay 系統延遲	μsec	≤3		
VSWR 駐波比		≤1.5		
Spurious Emissions 混附波輻射		Comply with 3GPP TS36.106 & TS38.106		
Spectrum Emission Mask 混附波輻射波罩		Comply with 3GPP TS36.106 & TS38.106		
Optical Output Power (Downlink) @1550 nm 下行輸出光功率@1550 nm	dBm	-6±3		
Optical Receiver Sensitivity (Uplink) @1310 nm 上行光接收靈敏度@1310 nm	dBm	-15		

Mechanical Parameters 機械參數		
Dimensions, H x W x D 尺寸	mm	Standard 19" 2U
Weight (approx.) 重量	kg	7
Power Supply 電源		AC100~240V, Comply with EN60950
Power Consumption (approx.) 消耗電功率	W	≤45
RF Connectors 射頻接頭		1*N-Female or 4.3-10-Female, 50Ω (customizable)
FO Connectors 光接頭		8* LC/SC/FC - UPC/APC (customizable)
Local Control 本地控制		LCD+Keypad & Wi-Fi via Web Browser USB-C/RJ45 (customizable)
OMC 連接網管方式		Via Wi-Fi or LTE Wireless Modem
Operating Temperature 工作溫度	°C	-10 to +55
Operating Humidity 工作濕度	%	≤95
Ingress Protection 異物防護等級		IP40, Indoor
Installation Type 安裝方式		19" Rack or Wall Mount
MTBF 平均故障間隔時間	Hours	≥50000



Tri Band

FIBER OPTICAL SYSTEM
S-FWXXXXX-091821-X

Specifications

1:16 Master Unit (MU) : S-FWM40-091821-16 MU



正面



背面

Electrical Parameters 電性參數		900MHz	1800MHz	2100MHz
Uplink Frequency Range 上行頻率範圍	MHz	885-915	1710-1785	1920-1980
Downlink Frequency Range 下行頻率範圍	MHz	930-960	1805-1880	2110-2170
Operating Mode 工作模式		FDD-LTE	FDD-LTE	FDD-NR
Operating Bandwidth 工作頻寬	MHz	30	75	60
RF Output Power (Uplink) 上行射頻輸出功率	dBm	23±2	23±2	23±2
Uplink Gain 上行增益	dB	40±3	40±3	40±3
Downlink Gain 下行增益	dB	40±3	40±3	40±3
Manual Gain Control (1dB step) 手動增益控制 (全頻帶調整每階 1dB)	dB	0-31	0-31	0-31
Max. No Damage RF Input Power (Downlink) 無損壞最大下行射頻輸入功率	dBm	-10	-10	-10
Pass Band Ripple (p-p) 通過頻帶波紋	dB	≤±4	≤±4	≤±4
EVM 誤差向量幅度	%	≤8	≤8	≤3.5
Frequency Stability 頻率穩定度	ppm	≤0.01		
Noise Figure (1x RU: MU) 雜訊指數 (1x RU: MU)	dB	≤5		
System Delay 系統延遲	μsec	≤3		
VSWR 駐波比		≤1.5		
Spurious Emissions 混附波輻射		Comply with 3GPP TS36.106 & TS38.106		
Spectrum Emission Mask 混附波輻射波罩		Comply with 3GPP TS36.106 & TS38.106		
Optical Output Power (Downlink) @1550 nm 下行輸出光功率@1550 nm	dBm	-6±3		
Optical Receiver Sensitivity (Uplink) @1310 nm 上行光接收靈敏度@1310 nm	dBm	-15		

Mechanical Parameters 機械參數		
Dimensions, H x W x D 尺寸	mm	Standard 19" 2U
Weight (approx.) 重量	kg	8
Power Supply 電源		AC100~240V, Comply with EN60950
Power Consumption (approx.) 消耗電功率	W	≤45
RF Connectors 射頻接頭		1*N-Female or 4.3-10-Female, 50Ω (customizable)
FO Connectors 光接頭		16* LC/SC/FC - UPC/APC (customizable)
Local Control 本地控制		LCD+Keypad & Wi-Fi via Web Browser USB-C/RJ45 (customizable)
OMC 連接網管方式		Via Wi-Fi or LTE Wireless Modem
Operating Temperature 工作溫度	°C	-10 to +55
Operating Humidity 工作濕度	%	≤95
Ingress Protection 異物防護等級		IP40, Indoor
Installation Type 安裝方式		19" Rack or Wall Mount
MTBF 平均故障間隔時間	Hours	≥50000



Tri Band

FIBER OPTICAL SYSTEM
S-FWXXXXX-091821-X

Specifications

20dBm Remote Unit (RU) : S-FWR4020-091821

RU
20dBm



Electrical Parameters 電性參數		900MHz	1800MHz	2100MHz
Uplink Frequency Range 上行頻率範圍	MHz	885-915	1710-1775	1920-1980
Downlink Frequency Range 下行頻率範圍	MHz	930-960	1805-1870	2110-2170
Operating Mode 工作模式		FDD-LTE	FDD-LTE	FDD-NR
Operating Bandwidth 工作頻寬	MHz	30	65	60
RF Output Power (Downlink) 下行射頻輸出功率	dBm	20±2	20±2	20±2
Uplink Gain 上行增益	dB	40±3	40±3	40±3
Downlink Gain 下行增益	dB	40±3	40±3	40±3
Manual Gain Control (1dB step) 手動增益控制 (每階 1dB)	dB	0-31	0-31	0-31
Auto Level Control 自動電平控制	dB	≥20	≥20	≥20
Pass Band Ripple (p-p) 通過頻帶波紋	dB	≤±4	≤±4	≤±4
EVM 誤差向量幅度	%	≤8	≤8	≤3.5
Frequency Stability 頻率穩定度	ppm	≤0.01		
Noise Figure (1x RU: MU) 雜訊指數 (1x RU: MU)	dB	≤5 Uplink		
System Delay 系統延遲	μsec	≤3		
VSWR 駐波比		≤2.4		
Spurious Emissions 混附波輻射		Comply with 3GPP TS36.106 & TS38.106		
Spectrum Emission Mask 混附波輻射波罩		Comply with 3GPP TS36.106 & TS38.106		
Optical Output Power (Uplink) @1310 nm 上行輸出光功率@1310 nm	dBm	3±3		
Optical Receiver Sensitivity (Downlink) @1550 nm 下行輸出光功率@1550 nm	dBm	-15		

Mechanical Parameters 機械參數		
Dimensions, H x W x D 尺寸	mm	250*200*50
Weight (approx.) 重量	kg	3
Power Supply 電源		AC100~240V, Comply with EN60950
Power Consumption (approx.) 消耗電功率	W	≤30
RF Connectors 射頻接頭		1*N-Female or 4.3-10-Female, 50Ω (customizable)
FO Connectors 光接頭		1*LC/SC/FC - UPC/APC (customizable)
Local Control 本地控制		LCD+Keypad & Wi-Fi via Web Browser USB-C/RJ45 (customizable)
OMC 連接網管方式		Through MU via Fiber Cable
Operating Temperature 工作溫度	°C	-10 to +55
Operating Humidity 工作濕度	%	≤95
Ingress Protection 異物防護等級		IP40, Indoor
Installation Type 安裝方式		Wall or Pole Mount
MTBF 平均故障間隔時間	Hours	≥50000



Tri Band

FIBER OPTICAL SYSTEM
S-FWXXXXX-091821-X

Specifications

27dBm Remote Unit (RU) : S-FWR4527-091821

RU
27dBm



Electrical Parameters 電性參數		900MHz	1800MHz	2100MHz
Uplink Frequency Range 上行頻率範圍	MHz	885-915	1710-1775	1920-1980
Downlink Frequency Range 下行頻率範圍	MHz	930-960	1805-1870	2110-2170
Operating Mode 工作模式		FDD-LTE	FDD-LTE	FDD-NR
Operating Bandwidth 工作頻寬	MHz	30	65	60
RF Output Power (Downlink) 下行射頻輸出功率	dBm	27±2	27±2	27±2
Uplink Gain 上行增益	dB	40±3	40±3	40±3
Downlink Gain 下行增益	dB	45±3	45±3	45±3
Manual Gain Control (1dB step) 手動增益控制 (每階 1dB)	dB	0-31	0-31	0-31
Auto Level Control 自動電平控制	dB	≥20	≥20	≥20
Pass Band Ripple (p-p) 通過頻帶波紋	dB	≤±4	≤±4	≤±4
EVM 誤差向量幅度	%	≤8	≤8	≤3.5
Frequency Stability 頻率穩定度	ppm	≤0.01		
Noise Figure (1x RU: MU) 雜訊指數 (1x RU: MU)	dB	≤5 Uplink		
System Delay 系統延遲	μsec	≤3		
VSWR 駐波比		≤2.4		
Spurious Emissions 混附波輻射		Comply with 3GPP TS36.106 & TS38.106		
Spectrum Emission Mask 混附波輻射波罩		Comply with 3GPP TS36.106 & TS38.106		
Optical Output Power (Uplink) @1310 nm 上行輸出光功率@1310 nm	dBm	3±3		
Optical Receiver Sensitivity (Downlink) @1550 nm 下行輸出光功率@1550 nm	dBm	-15		

Mechanical Parameters 機械參數		
Dimensions, H x W x D 尺寸	mm	350*250*65
Weight (approx.) 重量	kg	7
Power Supply 電源		AC100~240V, Comply with EN60950
Power Consumption (approx.) 消耗電功率	W	≤90
RF Connectors 射頻接頭		1*N-Female or 4.3-10-Female, 50Ω (customizable)
FO Connectors 光接頭		1*LC/SC/FC - UPC/APC (customizable)
Local Control 本地控制		LCD+Keypad & Wi-Fi via Web Browser USB-C/RJ45 (customizable)
OMC 連接網管方式		Through MU via Fiber Cable
Operating Temperature 工作溫度	°C	-10 to +55
Operating Humidity 工作濕度	%	≤95
Ingress Protection 異物防護等級		IP40, Indoor
Installation Type 安裝方式		Wall or Pole Mount
MTBF 平均故障間隔時間	Hours	≥50000



Tri Band

FIBER OPTICAL SYSTEM
S-FWXXXXX-091821-X

Specifications

33dBm Remote Unit (RU) : S-FWR5033-091821

RU
33dBm



Electrical Parameters 電性參數		900MHz	1800MHz	2100MHz
Uplink Frequency Range 上行頻率範圍	MHz	885-915	1710-1785	1920-1980
Downlink Frequency Range 下行頻率範圍	MHz	930-960	1805-1880	2110-2170
Operating Mode 工作模式		FDD-LTE	FDD-LTE	FDD-NR
Operating Bandwidth 工作頻寬	MHz	30	75	60
RF Output Power (Downlink) 下行射頻輸出功率	dBm	33±2	33±2	33±2
Uplink Gain 上行增益	dB	45±3	45±3	45±3
Downlink Gain 下行增益	dB	50±3	50±3	50±3
Manual Gain Control (1dB step) 手動增益控制 (每階 1dB)	dB	0-31	0-31	0-31
Auto Level Control 自動電平控制	dB	≥20	≥20	≥20
Pass Band Ripple (p-p) 通過頻帶波紋	dB	≤±4	≤±4	≤±4
EVM 誤差向量幅度	%	≤8	≤8	≤3.5
Frequency Stability 頻率穩定度	ppm	≤0.01		
Noise Figure (1x RU: MU) 雜訊指數 (1x RU: MU)	dB	≤5 Uplink		
System Delay 系統延遲	µsec	≤3		
VSWR 駐波比		≤1.5		
Spurious Emissions 混附波輻射		Comply with 3GPP TS36.106 & TS38.106		
Spectrum Emission Mask 混附波輻射波罩		Comply with 3GPP TS36.106 & TS38.106		
Optical Output Power (Uplink) @1310 nm 上行輸出光功率@1310 nm	dBm	3±3		
Optical Receiver Sensitivity (Downlink) @1550 nm 下行輸出光功率@1550 nm	dBm	-15		

Mechanical Parameters 機械參數		
Dimensions, H x W x D 尺寸	mm	350*250*110
Weight (approx.) 重量	kg	9
Power Supply 電源		AC100~240V, Comply with EN60950
Power Consumption (approx.) 消耗電功率	W	≤90
RF Connectors 射頻接頭		1*N-Female or 4.3-10-Female, 50Ω (customizable)
FO Connectors 光接頭		1*LC/SC/FC - UPC/APC (customizable)
Local Control 本地控制		LCD+Keypad & Wi-Fi via Web Browser USB-C/RJ45 (customizable)
OMC 連接網管方式		Through MU via Fiber Cable
Operating Temperature 工作溫度	°C	-10 to +55
Operating Humidity 工作濕度	%	≤95
Ingress Protection 異物防護等級		IP40, Indoor
Installation Type 安裝方式		Wall or Pole Mount
MTBF 平均故障間隔時間	Hours	≥50000



Tri Band

FIBER OPTICAL SYSTEM
S-FWXXXXX-091821-X

Specifications

37dBm Remote Unit (RU) : S-FWR5537-091821

RU
37dBm



Electrical Parameters 電性參數		900MHz	1800MHz	2100MHz
Uplink Frequency Range 上行頻率範圍	MHz	885-915	1710-1785	1920-1980
Downlink Frequency Range 下行頻率範圍	MHz	930-960	1805-1880	2110-2170
Operating Mode 工作模式		FDD-LTE	FDD-LTE	FDD-NR
Operating Bandwidth 工作頻寬	MHz	30	75	60
RF Output Power (Downlink) 下行射頻輸出功率	dBm	37±2	37±2	37±2
Uplink Gain 上行增益	dB	50±3	50±3	50±3
Downlink Gain 下行增益	dB	55±3	55±3	55±3
Manual Gain Control (1dB step) 手動增益控制 (每階 1dB)	dB	0-31	0-31	0-31
Auto Level Control 自動電平控制	dB	≥20	≥20	≥20
Pass Band Ripple (p-p) 通過頻帶波紋	dB	≤±4	≤±4	≤±4
EVM 誤差向量幅度	%	≤8	≤8	≤3.5
Frequency Stability 頻率穩定度	ppm	≤0.01		
Noise Figure (1x RU: MU) 雜訊指數 (1x RU: MU)	dB	≤5 Uplink		
System Delay 系統延遲	μsec	≤3		
VSWR 駐波比		≤1.5		
Spurious Emissions 混附波輻射		Comply with 3GPP TS36.106 & TS38.106		
Spectrum Emission Mask 混附波輻射波罩		Comply with 3GPP TS36.106 & TS38.106		
Optical Output Power (Uplink) @1310 nm 上行輸出光功率@1310 nm	dBm	3±3		
Optical Receiver Sensitivity (Downlink) @1550 nm 下行輸出光功率@1550 nm	dBm	-15		

Mechanical Parameters 機械參數		
Dimensions, H x W x D 尺寸	mm	500*440*187
Weight (approx.) 重量	kg	30
Power Supply 電源		AC100~240V, Comply with EN60950
Power Consumption (approx.) 消耗電功率	W	≤300
RF Connectors 射頻接頭		1*N-Female or 4.3-10-Female, 50Ω (customizable)
FO Connectors 光接頭		1*LC/SC/FC - UPC/APC (customizable)
Local Control 本地控制		LCD+Keypad & Wi-Fi via Web Browser USB-C/RJ45 (customizable)
OMC 連接網管方式		Through MU via Fiber Cable
Operating Temperature 工作溫度	°C	-10 to +55
Operating Humidity 工作濕度	%	≤95
Ingress Protection 異物防護等級		IP65, Indoor&Outdoor
Installation Type 安裝方式		Wall or Pole Mount
MTBF 平均故障間隔時間	Hours	≥50000