

SPINNER Antenna Monitoring System

**Distance
to Fault
Detection**



The SPINNER Antenna Monitoring System (AMS) protects broadcasting infrastructure by continuous monitoring of the entire antenna system and early detection of any arcing or water ingress. It informs you about the fault as well as its location in order to avoid a severe failure.

Radio and television broadcasters worldwide rely on their systems to deliver content to listeners and viewers. Although their infrastructure may be robust, it can still be vulnerable.

Arcing or water ingress can occur for various reasons such as damaged components by bad weather or long-term use, improper installation, RF overloads, or even unexpected events.

The heat generated by the arc can damage the infrastructure or even lead to fire, thus completely disabling the broadcast system. The resulting long off-air times and financial losses incurred by repairs and legal claims are often substantial.

Operators therefore need a reliable early failure detection system to prevent serious damage. The SPINNER Antenna Monitoring System can help with this.

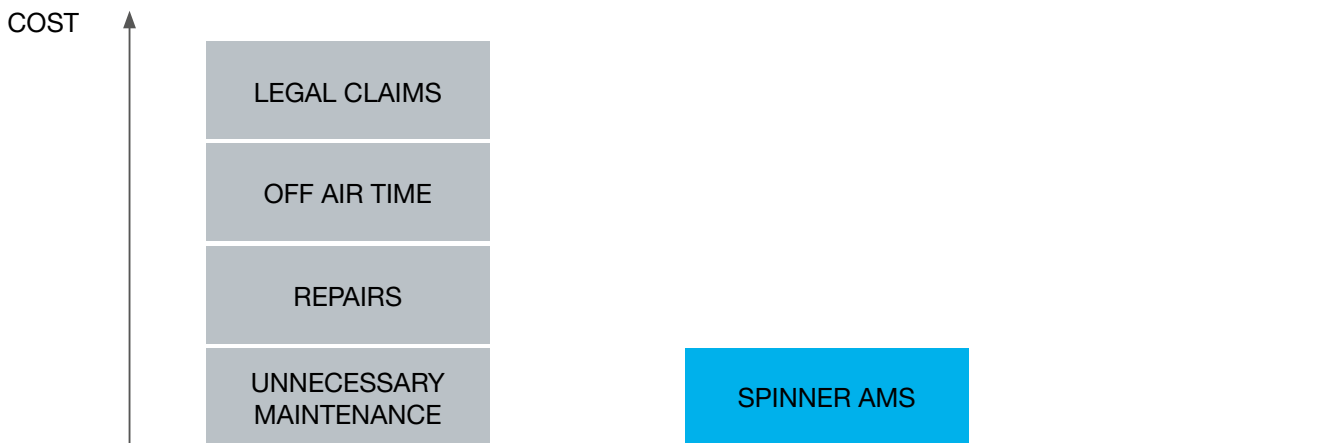
SPINNER Antenna Monitoring System

The AMS uses two different measurement methods to reliably detect any type of arc, even ones that won't cause VSWR degradation. It also informs you where the problem is so it can be quickly repaired, thus saving you both time and money.

If a fault is detected, you are informed not only locally by LED lamps, but also remotely via SNMP and a user-friendly web interface. Optionally, you can also connect the AMS to the interlock loop of your transmitter, switching it off in the event of an alarm to protect the infrastructure.

Optionally, a power monitoring add-on is also available. It monitors the power level and return losses on up to four RF channels (eight RF probes). Different thresholds for warnings and alarms can be individually set. All of the information is displayed on the web interface and also sent via SNMP. An interlock interface is also available.

It has an ingeniously simple design, with easy and fast installation. All the components are housed indoors. There are no invasive changes to the system and no signals are injected into your antenna.



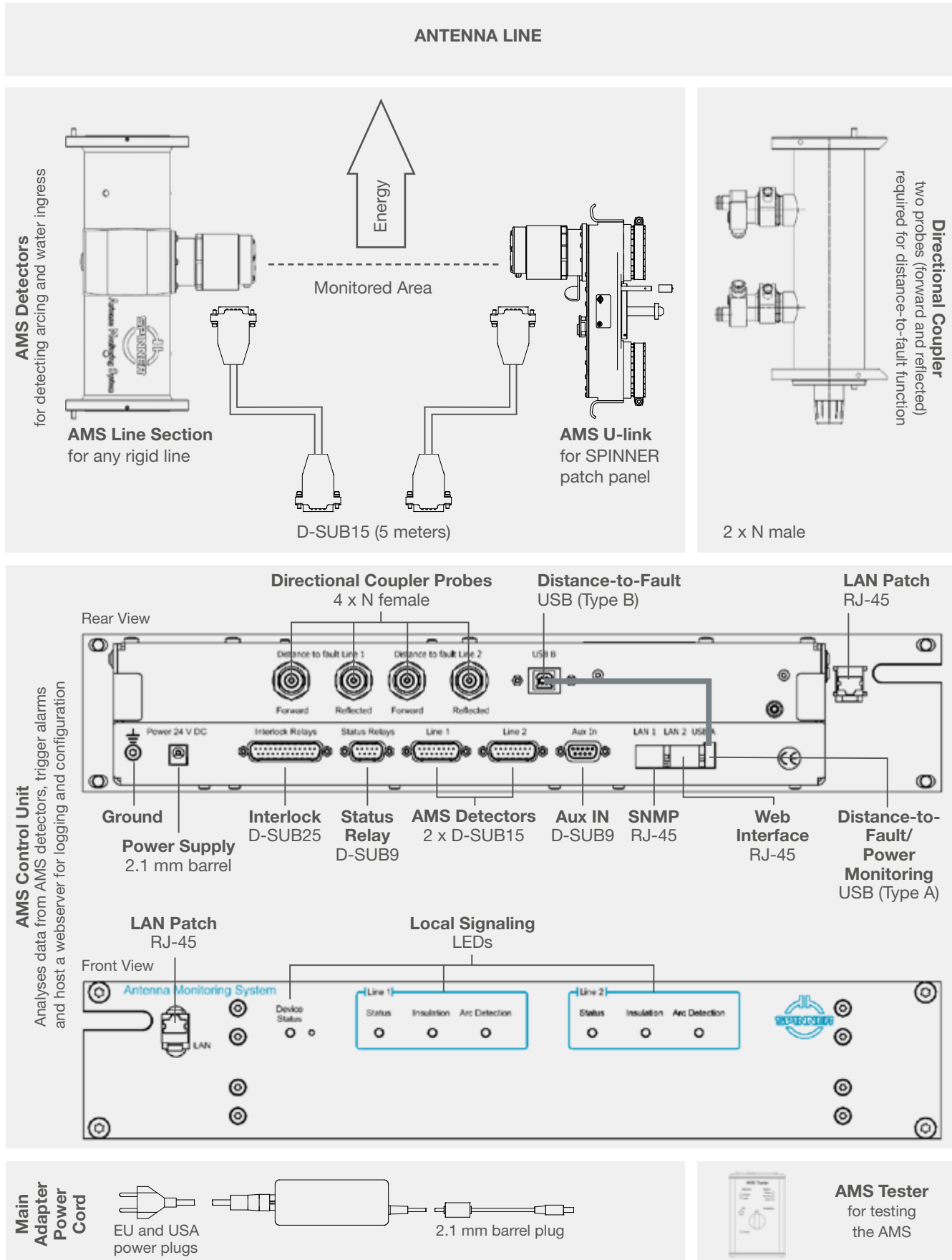
Off-air time isn't just a technical issue. The financial cost of repairs and claims brought by content providers can also be huge. By helping you avoid these pitfalls, the AMS gives you enormous value for money.

Features:

- Arcing detection
- Water ingress detection
- Detection regardless antenna height
- Distance-to-fault information
- Remote monitoring via SNMP and web interface
- Local signalization via LEDs and status relays
- Protection by integration in interlock loop
- Optional power monitoring add-on
- Compact design
- Fast and easy installation
- All components indoors
- No invasive changes to the system
- No signal injected into antenna line
- Suitable for pressurized lines
- 4 digital inputs for any use, e.g. pressure sensors

SPINNER Antenna Monitoring System

Schematic



SPINNER Antenna Monitoring System

AMS Control Unit

Collects and analyzes data from AMS detectors and directional couplers. When thresholds are exceeded, it triggers warnings and alarms via relay contacts and SNMP. It also hosts a web server for convenient configuration of the AMS system.



General Data

Broadcast standards	FM, DAB, ATSC 1.0, ATSC 3.0, DVB-T/T2, ISDB-Tb
Arc detection, min.	100 μ s
Distance-to-fault accuracy	\pm 2 meters
Emission	No signal injected into antenna line
Size of non-volatile memory, min.	250,000 entries for resistance values, warnings, alarms (10 years of logging with one record per hour)

Mechanical Data

Material and surface	Aluminum alloy
Dimensions (L x W x H) mm	158 x 483 x 88 mm (19", 2RU)
Weight	2.5 kg
IP protection level	IP40 per EN 60529
MTBF	220,000 h (40 °C ambient temperature)

Electrical Data

Main adapter interface	Power cords for USA, EU and UK (available on request)
Main adapter voltage	80 VAC to 264 VAC, 47 to 63 Hz, 113 VDC to 370 VDC
Power consumption, max	40 W

Interfaces

AMS detectors	2 x D-SUB 15
Interlock	D-SUB 25 plug 10 potential-free relay contacts, open active, max. 42.4 V ACpk / 60 V DC, 0.5 A, SELV
Relay status	D-SUB 9 plug 3 potential-free relay contacts, open active, max. 42.4 V ACpk / 60 V DC, 0.5 A, SELV
Auxiliary inputs	D-SUB 9 socket 4 digital inputs, electrically isolated, potential-free 8 V DC to 28 V DC, any polarity, high active
SNMP (LAN1)	RJ-45 (LAN1 or LAN2 can be patched to front panel) SNMPv2c, based on IRT recommendations
Web interface (LAN2)	RJ-45 (LAN1 or LAN2 can be patched to front panel) IE 9 or higher, Firefox
Local signalization	LEDs on front panel and AMS detectors
Directional coupler probes for distance-to-fault function	4 x N female (50 Ohms)
Power monitoring add-on	USB (type A)

AMS Antenna Monitoring System

AMS Line Section

AMS detector for mounting in any rigid line run



General Information

Material and surface	Aluminum alloy, painted
IP protection level	IP 50 per EN 60529
Interface	D-SUB 15 socket

Band II

Size	1 5/8" EIA	3 1/8" EIA	4 1/2" EIA	6 1/8" EIA	7 3/16" ¹	8 3/16" ¹	9 3/16" ¹
Impedance	50 Ω	50 Ω	50 Ω	50 Ω	75 Ω	75 Ω	50 Ω
Proof voltage	7 kV	16 kV	18 kV	22 kV	22 kV	24 kV	24 kV
Avg. power (at 108 MHz)	20 kW	67 kW	127 kW	140 kW	202 kW	256 kW	360 kW
VSWR	1.06						
Dimension (L x W x H) mm	310x120x300	355x130x215	360x160x260	480x210x305	515x245x415	544x280x435	535x310x390
Weight	7.5 kg	4.5 kg	6.5 kg	12 kg	18 kg	22 kg	27 kg

Band III

Size		3 1/8" EIA	4 1/2" EIA	6 1/8" EIA	7 3/16" ¹	8 3/16" ¹	
Impedance		50 Ω	50 Ω	50 Ω	75 Ω	75 Ω	
Proof voltage		14 kV	18 kV	22 kV	34 kV	38 kV	
Avg. power (at 254 MHz)		44 kW	64 kW	100 kW	132 kW	167 kW	
VSWR		1.06					
Dimension (L x W x H) mm		335x130x236	360x160x235	460x210x270	515x245x325	565x280x345	
Weight		5 kg	6.5 kg	12 kg	18 kg	22 kg	

Band IV / V

Size	1 5/8" EIA	3 1/8" EIA	4 1/2" EIA	6 1/8" EIA	7 3/16" ¹	8 3/16" ¹	
Impedance	50 Ω	50 Ω	50 Ω	50 Ω	75 Ω	75 Ω	
Proof voltage	7 kV	16 kV	22 kV	22 kV	30 kV	34 kV	
Avg. power (at 800 MHz)	7 kW	20 kW	40 kW	65 kW	77 kW ²	101 kW ³	
VSWR	1.06						
Dimension (L x W x H) mm	310x120x300	335x195x200	360x160x250	460x210x290	515x245x355	545x280x375	
Weight	7.5 kg	6 kg	9 kg	12 kg	19 kg	20 kg	

¹ Can be pressurized up to 0.35 bar (5 psig)

² Avg. power at 746 MHz

³ Avg. power at 698 MHz

AMS Antenna Monitoring System

AMS U-link

AMS detector for mounting on SPINNER patch panels



General Information

Interlock types	Interlock 1, interlock 2
Versions	USL-D, USL
Material and surface	Aluminum alloy
IP protection level	IP 50 per EN 60529
Interface	D-SUB 15 socket

Band II

Size	1 5/8"	29.5 - 68	43 - 98	
Impedance		50 Ω		
Proof voltage	7 kV	13.5 kV	8 kV	
Avg. power (at 108 MHz)	20 kW	51 kW	98 kW	
VSWR		1.06		
Dimension (L x W x H) mm	295 x 105 x 205	295 x 105 x 205	395 x 140 x 270	
Weight	2.5 kg	2.6 kg	7 kg	

Band III

Size	1 5/8"	29.5 - 68		
Impedance		50 Ω		
Proof voltage		5.5 kV		
Avg. power (at 254 MHz)	13 kW	33 kW		
VSWR		1.06 ¹		
Dimension (L x W x H) mm	295x 105 x 205	295 x 105 x 205		
Weight	2.5 kg	2.6 kg		

Band IV/V

Size	1 5/8"	29.5 - 68	43 - 98	52 - 120
Impedance			50 Ω	
Proof voltage	7 kV	13 kV	19 kV	25 kV
Avg. power (at 800 MHz)	7 kW	17.5 kW	35 kW	60 kW
VSWR			1.06	
Dimension (L x W x H) mm	295 x 105 x 205	295 x 105x 205	395 x 140 x 258	570 x 180 x 310
Weight	2.5 kg	2.6 kg	7 kg	11.5 kg

¹ 1.09 from 240 MHz to 254 MHz

AMS Antenna Monitoring System

Part Numbers

The AMS can be only ordered as a kit, consisting of control unit and one or two AMS detectors.
For spare parts or accessories, please see page 14.

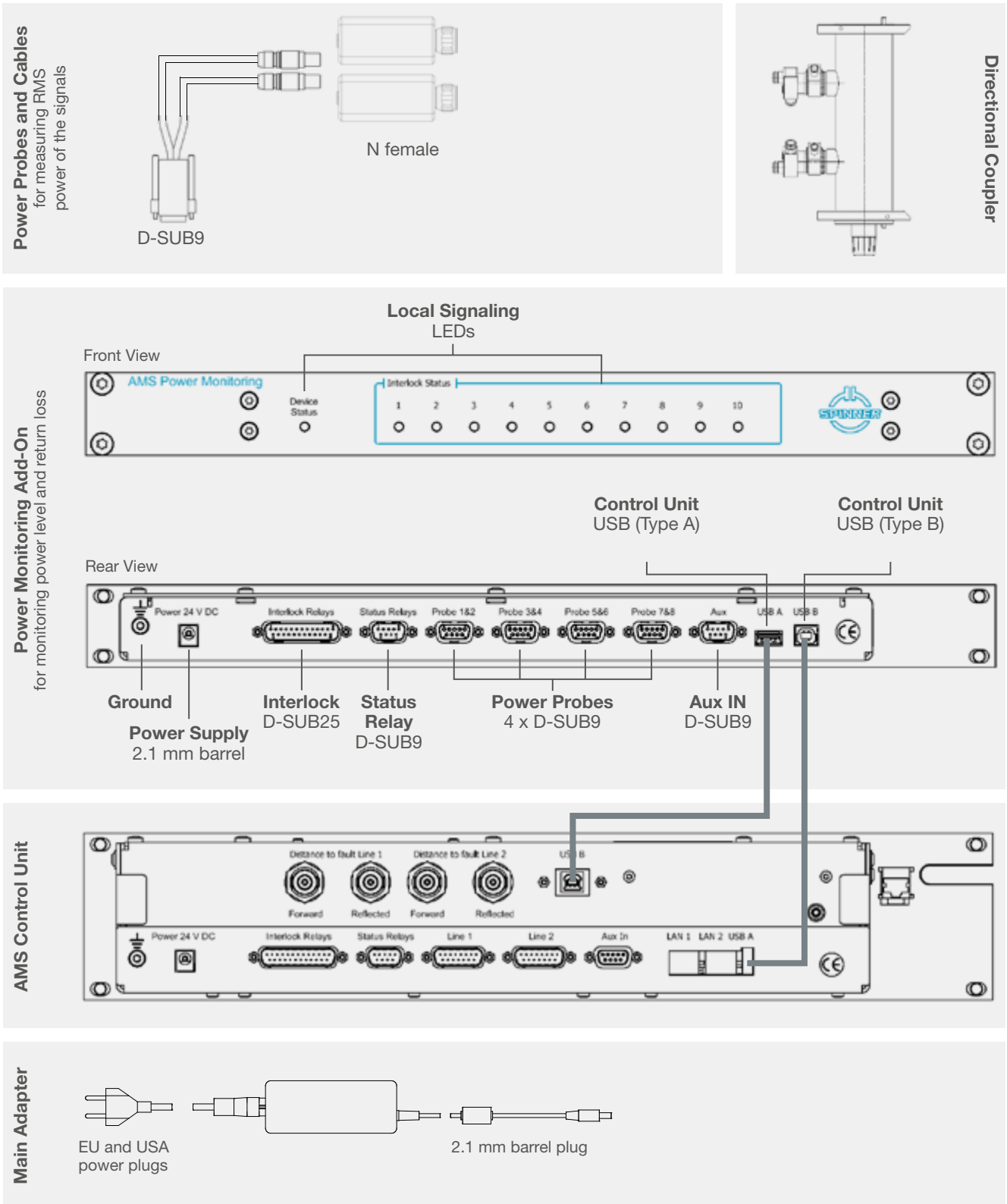
Basic Number							AMS Detector (AMS Line Section or AMS U-Link)				
							Size	Type	Quantity	Version	
5	5	5	X	X	X	C	X	X	X	X	
AMS kit for band II			0	2	2						
AMS kit for band III			0	3	2						
AMS kit for band IV/V			0	4	2						
AMS line section		AMS U-link									
1 5/8" EIA		1 5/8"						1			
3 1/8" EIA		29.5-68						3			
4 1/2" EIA		43-98						4			
6 1/8" EIA		52-120						5			
(reserved for internal use)								6			
7 3/16"								7			
8 3/16"								8			
9 3/16"								9			
AMS U-link - interlock 1									1		
AMS U-link - interlock 2									2		
AMS line section - 50 Ohm									3		
AMS line section - 75 Ohm									4		
No. of AMS detectors (control unit can connect up to 2 AMS detectors)											
To be completed by SPINNER											

Scope of Delivery

Control unit, main adapter, power cord (EU and USA), AMS detector(s), D-SUB 15 connection cable(s) - 5 m

AMS Power Monitoring Add-On

Schematic



Antenna Monitoring System

SPINNER Antenna Monitoring System

AMS Power Monitoring Add-On

Monitors power level and return losses up to four RF channels (eight RF probes). It triggers user-definable warnings and alarms.



General Data

Part number	BN 555050C0000
Frequency range	50 MHz - 860 MHz
RF channels	Up to 4 channels (8 power probes)
Absolute power measurement accuracy	± 2.0 dB
Relative power measurement accuracy	± 0.5 dB
Power correction (over frequency)	-6 dB / octave
Polling rate via SNMP	6 s

Mechanical Data

Dimensions (L x W x H) mm	158 x 483 x 44 mm (19", 1RU)
Weight	1.6 kg
IP protection level	IP 40 per EN 60529

Electrical Data

Main adapter voltage	80 V AC to 264 V AC, 47 to 63 Hz, 113 V DC to 370 V DC
Main adapter interface	Power cords for USA, EU and UK (on request)
Power consumption, max.	10 W

Interfaces

Interlock	D-SUB 25 plug 10 potential-free relay contacts, open active, max. 42.4 V ACpk / 60 V DC, 0.5 A, SELV
Relay status	D-SUB 9 plug 3 potential-free relay contacts, open active, max. 42.4 V ACpk / 60 V DC, 0.5 A, SELV
Power probes	8 x N female (50 Ohm)
Data interface to AMS control unit	USB type A, USB type B

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AMS Power Probes & Cables

For measuring RMS signal power



FM and VHF Probes

Part number	BN 155891
Frequency range	50 MHz - 250 MHz
Power measurement range	-29 dBm to +15 dBm
Coaxial interface connector	1 x N female (50 Ω)
Dimensions (L x W x H) mm	90 x 35.5 x 26
Weight	155 g

UHF Probes

Part number	BN 155892
Frequency range	470 MHz - 860 MHz
Power measurement range	-34 dBm to +10 dBm
Coaxial interface connector	1 x N female (50 Ω)
Dimensions (L x W x H) mm	90 x 35.5 x 26
Weight	155 g

Connecting Cable

Part number	BN A75049	BN A75069	BN A76392
Type	Single cable 1 x Lemo FGG to D-SUB 9 2 metres	Y-cable 2 x Lemo FGG to D-SUB 9 2 metres	Y-cable 2 x Lemo FGG to D-SUB 9 5 metres

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Spare Parts and Accessories

AMS tester for testing the AMS functionality	BN 555010
Cable from control unit to AMS detector (length: 5 meters)	BN A75695
Cable from control unit to AMS detector (length: 30 meters)	BN A75696
Mains adapter	BN A76170
Power cord Europe	BN A76167
Power cord UK	BN A76168
Power cord North America	BN A76169
Directional couplers	See directional couplers at broadcast catalogue



AMS tester

Environmental Conditions

Operational conditions	ETSI EN 300 019-4-3 V2.3.2 (2009-1) class 3.1 N
Ambient temperature range	-10 °C to +45 °C
Relative humidity, max.	95 % (non-condensing)
De-rating of RF power and voltage with increasing altitude	See "Environmental Conditions for Broadcast Products" TD-00060.
Transport conditions	ETSI EN 300 019-1-2 V2.1.4 (2009-1) class 2.2
Ambient temperature range	-25 °C to +70 °C
Rain, condensation, icing	Not allowed
Storage conditions	ETSI EN 300 019-1-1 V2.1.4 (2009-1) class 1.2
Ambient temperature range	-10 °C to +45 °C
Rain, condensation, icing	Not allowed
Safety	EN 60125 (1994) / IEC 215 (1993)

Applicable Documents

Product manual AMS incl. AMS power monitoring	M36557
Product manual AMS tester	M36274