KINTRONIC LABS

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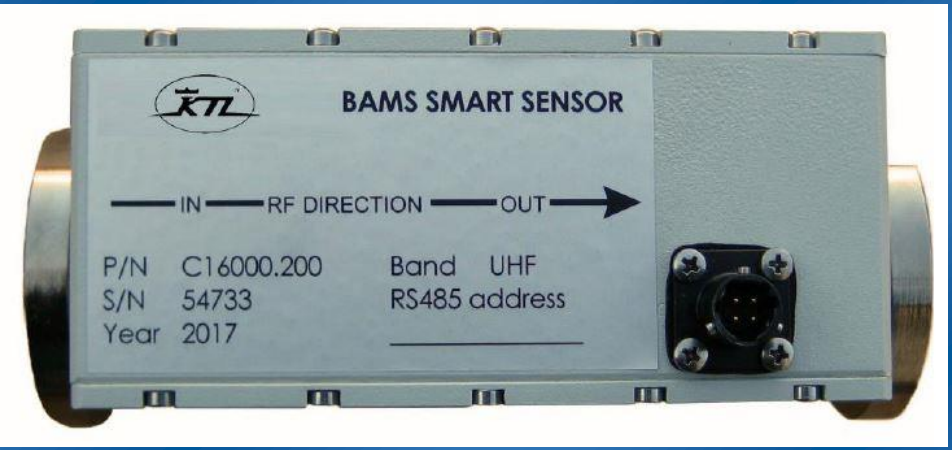
BAMS – The Antennas' Doctor



Broadcasting Antenna Monitoring System – BAMS

BE AWARE OF YOUR ANTENNA'S HEALTH AND PERFORMANCE **WHEREVER YOU ARE** THROUGH A SYSTEM **EMBEDDED** IN THE ANTENNA

- Broadcasting Antenna Systems detection and localization of transient and permanent faults or performance deviations
- real time measurement of the direct and reflected power of each single panel antenna via directional coupler equipped with apposite sensing
- frequency and channel selective power meter measurements
- measurement of environmental parameters (temperature, relative humidity, wind speed) for the analysis of performance deviation due to the environment
- water infiltration detection
- air quality check (pressure and dew point) for each panel in pressurized antennas
- IP65 directional coupler with built-in RF/AMBIENT/pneumatic sensing and RS485 serial interface
- Single line to connect up to 127 couplers up to 1500 meters
- Data acquisition software with performance logging and relevant statistical analysis
- Full remote control via internet, LAN, modem, etc.

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PHONE: +1 423 878-3141 **e-mail:** KTL@kintronic.com **website:** www.kintronic.com

UNEXPECTED BLACK-OUT: WHAT DO YOU PREFER?

Image	•*A CALL FROM THE CUSTOMER **AFTER** THE BLACKOUT?* •... OR A CALL FROM BAMS **BEFORE** THE BLACKOUT?
Strategy	•***RUN-TO-FAILURE** STRATEGY (reactive maintenance)* •*... OR **MONITOR-AND-CORRECT** STRATEGY (proactive maintenance)?*
Cost-1	•***URGENT & UNEXPECTED** SERVICE (expensive)* •*...OR **PLANNED & SCHEDULED** SERVICE (cheaper)?*
Cost-2	•*TO **REPLACE** DAMAGED COMPONENTS (no insight, no prevention)* •*... OR TO **INCREASE LIFETIME** OF EXISTING COMPONENTS? (with insight, you can prevent damage)?*
Time	•*TO **SEARCH FOR** WHAT/WHERE IS THE FAILURE* •*... OR **TO KNOW** WHAT/WHERE IS THE FAILURE?*
Awareness	•***BEFORE:** SEE THE EFFECTS --> **AFTER:** IMAGINE AND SEARCH FOR CAUSES* •*...OR **BEFORE:** SEE THE **CAUSES** --> **THEN:** IMAGINE & PREVENT THE EFFECTS?*
Efficiency	•***PERFORM ONE SERVICE** OPERATION PER MISSION* •*...OR **GROUP MORE SERVICE** OPERATIONS IN A SINGLE MISSION? (foresight and knowledge = ability to plan)*
MTTR	•***HIGH** MTTR (mean time to repair)* •*...OR **LOW** MTTR?*
Knowledge	•*KNOW **ONLY THE OVERALL EMITTED POWER*** •*...OR KNOW **WHAT'S HAPPENING ON EACH INDIVIDUAL CHANNEL?***

IF YOU SELECTED THE SECOND OPTION AT LEAST ONCE → **THEN YOU NEED BAMS!**

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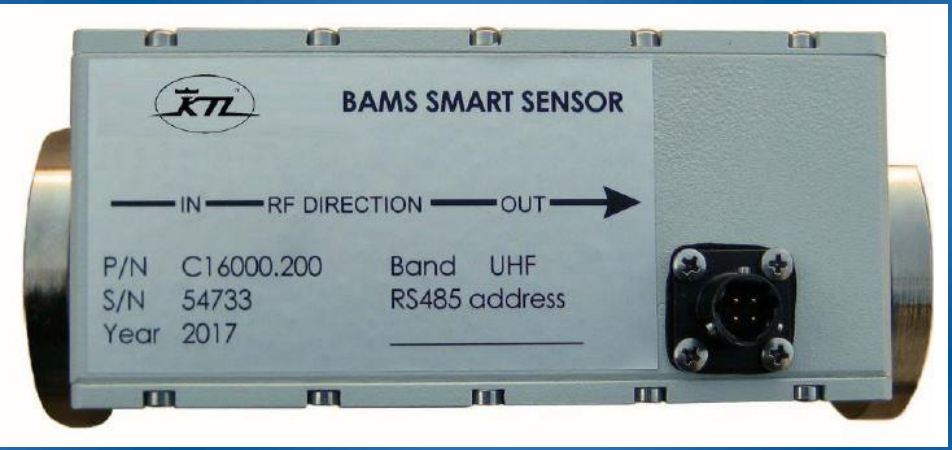
BAMS Components – 1. Smart Sensors (one per flange)



Four Models	:	UHF, VHF, DAB, FM
Insertion loss	:	< 0.05 dB
SWR	:	< 1.05 UHF model < 1.03 the other models
Impedance	:	50 Ω
Directivity	:	> 30 dB
Max working power	:	Depending on RF IN/OUT connectors
RF IN/OUT connectors	:	DIN 7/16” (male-male or female-female or mix), EIA 7/8”, 1-5/8” or EIA 3-1/8”
Power measurements	:	Forward and Reflected Power (RMS), channel selective for UHF and VHF versions
Power measurement accuracy	:	± 0.5 dB
Power measurement dynamic range	:	30 dB
RF line pneumatic measures	:	Temperature, pressure, relative humidity, dew point
Communication standard	:	Serial RS485 half-duplex
Power supply and serial connector	:	Two identical IP67 connectors for easy paralleling
Operating temperature	:	-67 to + 158 °F (-40 to + 70 °C)
Dimensions and weight	:	Depending on RF IN/OUT connectors
Mounting	:	Self-supported

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BAMS Components – 2. Data Manager (one per station)

Max No of directional coupler simultaneously controlled	:	Up to 127
Max distance from coupler to data logger	:	Up to 4920 ft (1500 m)
Main software features	:	- real time antenna system monitoring - problems and failures localization - assessment of site faults prior to dispatching personnel to site - programmable alarms and thresholds - data storage and long-term performance analysis - fast transient registration - analysis of failures or performance deviations caused by atmospheric phenomena - dew point and pressure monitor in pressurized antennas - moisture/water detection
Remote control	:	Ethernet port with the following protocols HTTP, TCP/IP, SNMP, TFTP, FTP, Telnet, DHCP others on request
Power supply	:	110-240 VAC 50/60 Hz (UPS embedded)
Power consumption	:	< 60 VA
Operating temperature	:	+14 to + 122 °F (-10 to + 50 °C)
Mounting	:	Wall, floor, 19” and ETSI N3 racks
Dimensions for 19” rack version	:	19” (482 mm) W, 1-3/4”H (44 mm) (1 U), 9-7/8” (250 mm) D
Weight	:	About 6.6 lbs (3 kg)

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Directional Coupler Performance

Frequency range	:	UHF, 470 – 870 MHz
Insertion loss	:	< 0,05dB
SWR	:	< 1,04
directivity	:	> 30 dB
Impedance	:	50 Ω
Max working power	:	2000 W rms
Measures	:	channel selective forward and reflected power (rms)
Power measures accuracy	:	± 0,5 dB
Minimum forward power measurable	:	2 W
Power measure dynamic range	:	30 dB
RF line internal ambient measures	:	temperature, pressure, relative humidity, dew point
RF IN/OUT connectors	:	flange EIA 7/8”
Power supply	:	12 Vdc
Communication standard	:	serial RS485 half-duplex
Power supply and serial connector	:	No 2 identical IP67 connectors for easy directional coupler paralleling
Operating temperature	:	-40 to + 70 °C (-67 to + 158 °F)
Weight	:	about 0,6 kg (1.3 lb)
Dimensions	:	70 x 96 x 162 mm (2.7 x 3.8 x 6.4 in)
Mounting	.:	self-sustaining by RF connector

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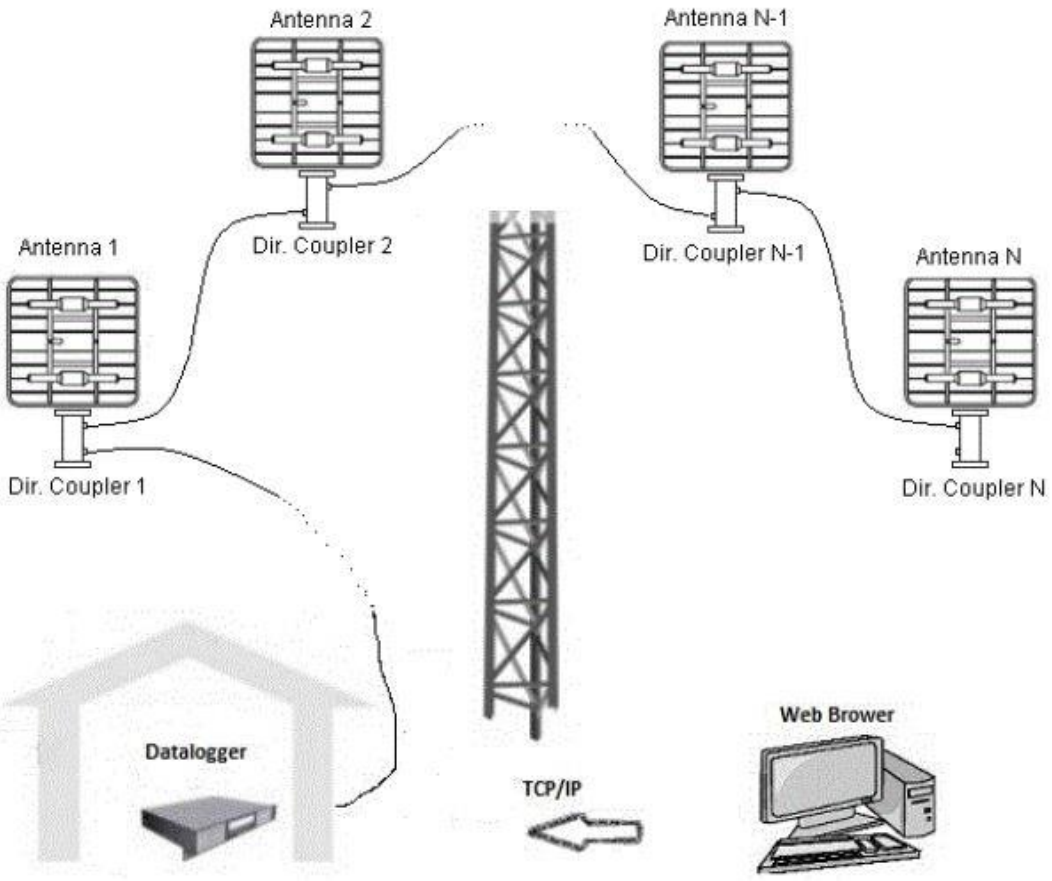
connection scheme



BAMS allows detection and localization of transient or permanent faults and performance deviation of antenna systems by directional couplers equipped with a wide range of sensors (RF, ambient and pneumatic), communication port (RS485), internal firmware, allowing operations such as autocalibration, equalization, and A/D conversion.

Two connectors allow the Couplers to be chain connected each other. Each connector is used for both power (12V) and signals (one balanced half-duplex RS485).The first coupler is connected to the data manager, while the last has only one connector engaged. Up to 127 couplers can be connected in parallel at a distance from the PC up to 1500 meters.

The management software, a web application, is designed for use in public (Internet) or private LAN and for the management of a modem or any other device used for "remote access".
As example of this software possibilities:
• real time monitoring of the antenna operations
• faults detection and localization
• analysis of "coincidences": ambient/environmental cause generating each fault and/or performance deviations
• storing and management database of historical events and data allowing the analysis of the most significant long-term deviation of performance for "aging" of the antenna components.

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BAMS – Additional Features

SELECTIVE MONITORING of Each **INDIVIDUAL CHANNEL**

EASY INSTALLATION by **FEW & SHORT CABLES** (Single cable for signal and power connection)

SINGLE SENSOR covering **30 dB POWER RANGE** (i.e. EIA 7/8 version covers 2 W - 2 kW)

CORRELATION between **ENVIRONMENTAL** conditions and antenna **PERFORMANCE**

NO JUNCTION BOX required

SLA (SERVICE LEVEL AGREEMENT) - measure and show your customer you really fulfilled it *for each channel*

PRESSURE MAP inside antenna allows one to **EASILY LOCALIZE AIR LEAKAGES** (pressure monitoring embedded in SMART sensors)

HARDENIZED by **DIGITAL** connection

WEATHER & PERFORMANCE DEVIATION - link antenna status to environmental conditions (temperature, relative humidity and wind)

TRANSIENT & PERMANENT Monitoring

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