



## SMART UNDERGROUND COMMUNICATIONS



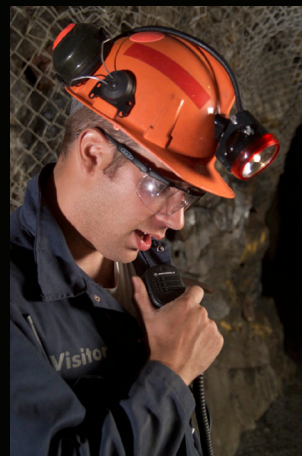
## VHF LEAKY FEEDER SYSTEM

- Widest Bandwidth Amplifier Available
- Common Amplifier Platform
- Highest RF Gain Amplifier Available
- Automatic Gain and Manual Gain Modes
- Supply Voltage Range, 5Vdc to 36Vdc
- 2 Year Component & Workmanship Warranty

## VHF LEAKY FEEDER OVERVIEW

All mines recognise the need for a reliable, robust and low maintenance communication system to enhance safety and production. The Becker Varis VHF leaky feeder system (smartcom®) is world renowned for its reliability, robust performance and maintainability.

Becker Varis recognises that one size doesn't fit all and that customers needs vary with the size of their mines and budgets. Leveraging off the successful and original smartcom® RNG-AMP we now offer an option for all mines to access the world's premium VHF Leaky Feeder system that also provides an upgrade path should you wish to enhance the system at a later stage.



### VOICE AND DATA

Smartcom® provides multiple simultaneous noise-free\* voice and data radio channels. The robust and low maintenance VHF communication platform ensures the lowest cost of ownership on the market. Narrowband radio modems can also be used to provide a 9600 bps fixed/mobile data connection over the entire coverage area of the Leaky Feeder network.

### 30MHZ BANDWIDTH

The industry leading 30MHz bandwidth allows multiple voice and data channels that operate simultaneously with super-low intermodulation noise levels.

### RF GAIN

The industry's highest RF Gain pilotless (in manual mode) amplifier with automatic and manual gain modes allows amplifiers to be installed at greater distances along the network, reducing required components. Automatic Gain mode allows the amplifiers to intelligently alter gain levels independently as the system grows and changes. This mode reduces system maintenance considerably reducing your maintenance costs.

## COMMUNICATION DETECTION SAFETY

smartcom®



### LOCAL DIAGNOSTICS

Local diagnostics are standard on all Becker Varis Amplifiers, this facilitates fault-finding and system troubleshooting by quickly being able to identify the component saving time and money.

- Local Diagnostics via 3 on board LED indicators
- Power On, RF Level OK Green LED
- Power On, RF Level Low Red LED
- Power On, RF Level High Yellow LED

### SMARTCOM® 150, BSC-AMP (NEW)

The Premium VHF Leaky Feeder at the right price for underground mines.

The smartcom® BSC-AMP provides customers a high value, robust and low maintenance VHF communication platform to operate your mine effectively without the added expense of costly data radios for onboard telemetry functions. All this while maintaining the Ethernet and remote diagnostics functions which many customers have come to depend on.

### BSC-AMP UPGRADE PATH

The new line amplifier has been designed so if customers' needs change the unit can be upgraded to include onboard analogue and digital telemetry or built in tag readers which is achieved by purchasing and installing an upgrade kit. The installation can be completed on site and does not require the unit to be returned.

The upgrade kit allows for continued fast and reliable system expansion when the need arises.

The data is represented on the Remote Diagnostics Server User Interface installed on the surface or thru Becker Varis' custom SCADA package.



## VHF LEAKY FEEDER OVERVIEW

### smartcom® 150, RNG-AMP (ORIGINAL)

The smartcom® RNG-AMP provides the same robust and low maintenance VHF communication platform with remote diagnostics and is Ethernet capable standard.

The high speed TCP/IP data transfer through the Leaky Feeder enables wired and wireless Ethernet applications such as control of fixed plant, where high speed data is required; promptly install the smartcom® Cable Modem and 802.11b/g Access Point to create a small hotspot.

The 30MHz bandwidth provides a 54 Mbps downstream, 40.96 Mbps upstream Ethernet connection. Standard Ethernet equipment can be easily connected cost effectively and is simple to install and maintain.

### POWER SUPPLIES

Becker Varis will cater to your needs for all your power supply needs with robust industry power supplies specifically built for the harsh conditions of underground mines; we have these units available in stock to support our customers. Power supplies can be spaced up to 8000 meters apart.



### NO RETURN PILOT

Smartcom® does not require a return pilot signal to operate which is a valuable advantage for its users. In automatic mode the amplifier makes use of a forward pilot system that is superior to systems that utilize return pilot.

In Automatic mode the product monitors the RF strength of the forward pilot from the base station at each amplifier and adjusts automatically to ensure the communications network is running at its optimum even as the system is reconfigured.

Return pilots are the weakest link in any leaky feeder system as they are installed to control the gain of all amplifiers in the network if a pilot fails or cable is damaged. System components will adjust to maximum gain and create significant system noise making voice communication difficult and frustrating.

Generally, return pilot systems require dedicated communication technicians or maintenance contracts with the OEMs to regularly maintain and monitor the communications system costing mines thousands of dollars in maintenance and reduces the overall safety and production benefits of the communication system.

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### AUTOMATION

The smartcom® product supports telemetry and can be effectively used for controlling underground equipment such as ventilation fans, pumps, stench gas firers and can provide desired information back to mine control systems effectively.

### DIGITAL OR ANALOGUE RADIO SYSTEM

The smartcom® products supports both analogue and digital radio repeaters so customers have a choice of radio infrastructure they wish to install; again providing the customer flexibility and choice.

### CUSTOMER SATISFACTION

The smartcom® product operates in hundreds of mines around the globe and customer satisfaction is unparalleled. Customer satisfaction is attributed to the ease of installation and maintenance and low operating cost which are key objectives when designing our products.

### PRODUCT DESIGN

Mines are inherently remote to major cities and towns making access to communication specialists and services difficult and costly for mining customers if systems are unreliable or require continuous maintenance. Reliable, Robust and Low Maintenance has been achieved with smartcom®.

### SYSTEM COMPATIBILITY

The smartcom® amplifiers are compatible with other leaky feeder systems and can be easily installed in existing networks, when doing this the choice would be the new RNG-AMP units as Ethernet and Remote Diagnostics are only achieved when a complete network of Becker amplifiers are utilized.



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VARIS SMART UNDERGROUND COMMUNICATIONS

General	RNG-AMP	BSC-AMP	RIS-AMP
Intrinsic Safety Approvals	n/a	n/a	MSHA / ATEX
System Impedance (ohms)	75 Ω		
Radiating Cable	RNG-500		
Amplifier Spacing	500m, 1650'		
Gain Control	Manual Gain Control (MGC), Automatic Gain Control (AGC)		
MGA & AGC Adjustment	15 dB Adjustment, 1 dB steps		
Upstream Voice Frequency Range	170 -174 MHz		
Downstream Voice Frequency Range	145 - 160 MHz		
Upstream Ethernet Frequency Range	175.8 - 182.2 MHz		
Downstream Ethernet Frequency Range	150 - 156 MHz		
Maximum Downstream Ethernet Data Rate	54 Mbps (DOCSIS 2.0 256 QAM)		
Maximum Upstream Ethernet Data Rate	31 Mbps (DOCSIS 2.0 64 QAM)		
Guaranteed TOI Noise Free Voice Channels	16		
Diagnostics	Local and Remote	Local	Local and Remote
Local Diagnostics	DC Voltage, Downstream Voice Level		
Maximum Amplifier Gain Downstream	25 dB		
Maximum Amplifier Gain Upstream	28 dB		

Electrical Specifications			
Supply Voltage	5.5 - 36 Vdc	7.0 - 36 Vdc	5.5 - 12.5 Vdc
Current Consumption	128mA @ 12 Vdc 73mA @ 36 Vdc	300mA @ 7 Vdc 89mA @ 36 Vdc	128mA @ 12 Vdc
Power Supply Spacing	Max 8000 metres	Max 8000 metres	Max 4000 Metres
Temperature Range	-20 to +60 °C (-4 to +140 °F)		
IP Rating	IP66		
Dimensions (L x H x W)	323 x 90 x 180mm (12.7 x 3.5 x 7.1 in)	290 x 91 x 120mm (11.42 x 3.6 x 4.7 in)	323 x 121 x 250mm (12.7 x 4.8 x 9.8 in)
Weight	1.00 Kg (2.20 lbs)	1.36 Kg (3.00 lbs)	3.2 Kg (7.05 lbs)
Connectors	Two 3 Terminal Lug Connectors, Two test BNC Jack ports	Two 3 Terminal Lug Connectors, Brass Block Foot Print	Two 3 Terminal Lug Connectors, Two test BNC Jack ports
Warranty (Component & workmanship)	24 month	24 month	24 month

\*System Installation Dependent

Technical data are limit values.

If the product is integrated into systems or operated in combination with other devices, its permissible operating values can deviate from these limit values. Subject to technical modifications without prior notice.

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