

## RF Electronics

# Compact EGC Outdoor Amplifier Model 93451

## Description

The Compact Electronic Gain Control (EGC) Outdoor Amplifier Model 93451 combines powerful performance with ease of use to meet the growing demands of operators. It provides advanced features and benefits to help operators reduce operating costs by streamlining amplifier deployment and configuration. This amplifier has been especially designed for outdoor use, and provides surge protection for all input and output ports. The amplifier housing is equipped with a double gasket to help ensure good RF shielding and protect against water and dust. It is well suited for network upgrades due to increased reverse gain.



The amplifier performs to 1 GHz in the forward path and can be configured electronically by using a handheld programmer terminal for rapid initial set-up or for adjustments that arise from network requirements shift. All settings are done without interrupting service, especially useful in networks which are delivering Voice over IP (VoIP) services. Settings of the amplifier can be established or modified by using a handheld programmer terminal, and can also be uploaded to the handheld programmer terminal for downloading to other amplifiers in order to streamline their configuration. Different forward gain settings can be obtained in the amplifier to enable support of several different applications within the network.

The number of plug-in accessories is reduced to help operators keep inventory and costs down. The full range electronic attenuators and equalizers offer improved versatility and make it possible to achieve the same adjustment range as with conventional plug-in or potentiometer solutions. Plug-in duplex filters are used to determine the forward or reverse band split.

To meet future demands for more bandwidth, the Compact EGC Outdoor Amplifier offers an electronic 862 MHz to 1 GHz field-programmable bandwidth extension, as well as a reverse path that can be upgraded to 200 MHz.

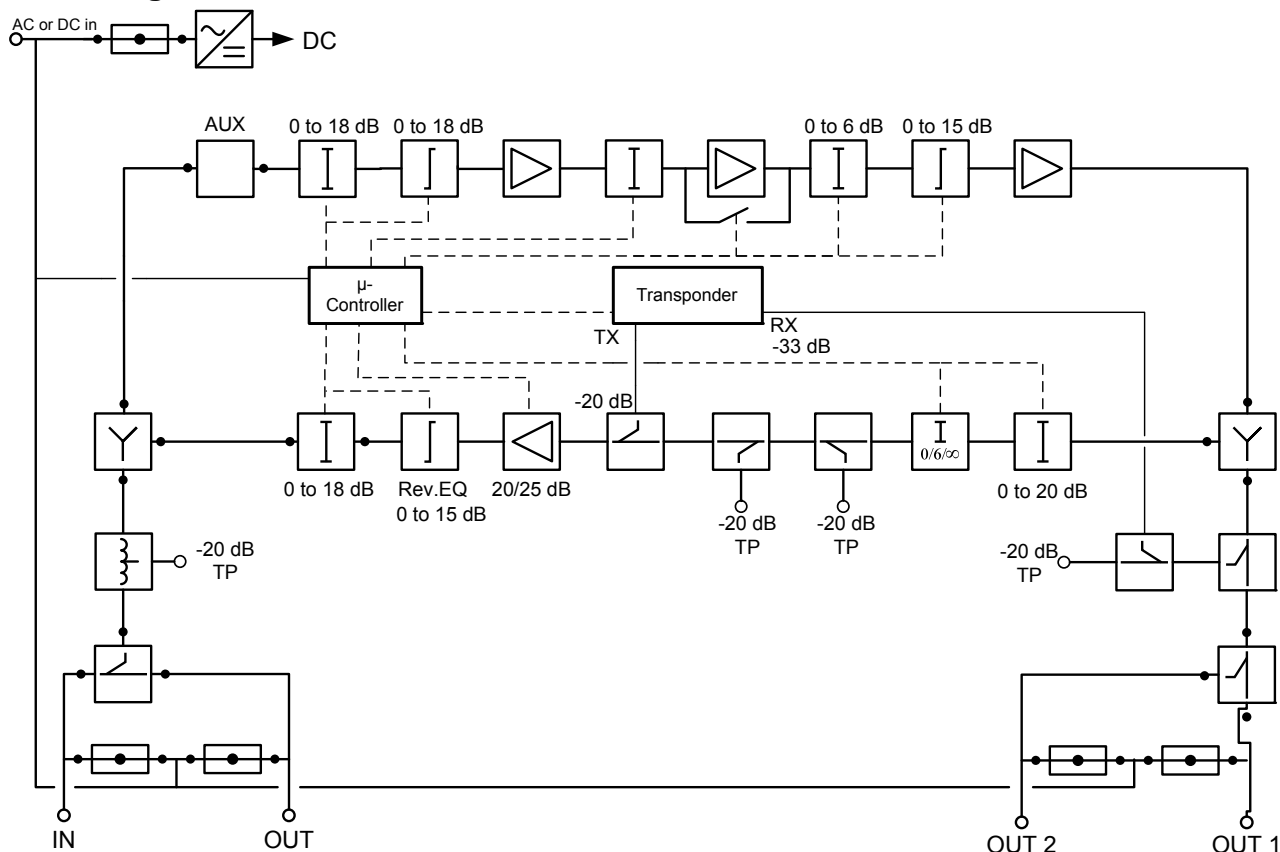
The Compact EGC Outdoor Amplifier 93451 can be configured with a Scientific Atlanta status monitoring transponder (SMC or HMS) to remotely monitor the critical parameters and control the built-in 3-state reverse switch. All settings are remotely addressable via the ROSA Element Management System to help reduce truck rolls and associated costs.

## Features

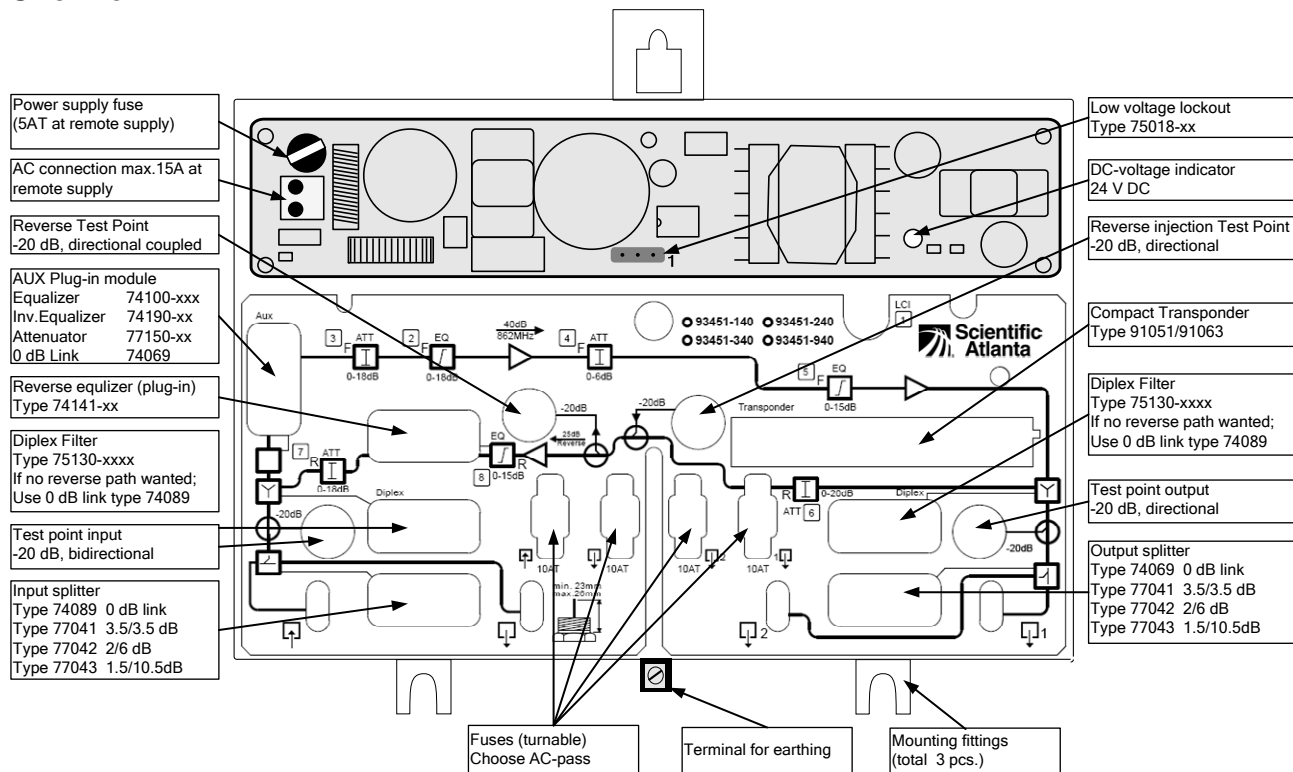
- Compact and rugged outdoor housing (IP68)
- 862 MHz or 1 GHz amplifier, frequency adjustable with handheld programmer terminal and ROSA
- GaAsFET gain block technology for improved distortion and noise performance
- Signal feed through at input with plug-in splitter
- Current feed through at all ports
- Directional output test point with adjustable frequency response through u-controller.
- All gain versions in one amplifier (28, 34 and 40 dB).
- Build in reverse amplifier with 200 MHz capability and selectable gain versions (20 and 25 dB).
- Plug-in, self-contained duplex filters for easy upgrade of reverse path bandwidth.
- Optional status monitoring and control
- Integrated 3-state reverse switch (on/-6 dB/off) allows the reverse input to be isolated for noise and ingress troubleshooting
- Both forward and reverse path are thermal compensated.
- Supports the Compact SMC and HMS transponders

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## Block Diagram



## Overview



## Specifications

General Performance	Units	Description	Notes
SMC/HMS Receive Level Attenuation	dB	-33 ± 0.75	
SMC/HMS Transmit Insertion Loss	dB	-20 ± 0.75	
Surge Protection	kV, $\mu$ s	6, 1.2/50	1
Enclosure Category	–	IP 68	
Emission, EN 50083-2	dBpW	< 20	
Screening	dB	> 85	
Connectors, Inputs and Outputs(reduction)	–	PG 11 (5/8")	
Test Point	–	F-connector, Female	
Electrical			
65 V COAX Line Powering (rms, sine)	V AC	24 to 65	
Power Consumption, network powered	W	25.5 with built-in reverse amp 27.5 with plug-in transponder	
Current Draw	A AC	See table	2
Max. Current, Inputs and Outputs	A AC	8	
Max. Current, Local Input	A AC	15	
Hum Modulation	dB	≤ -65	

Forward	Units	Description	Notes
Frequency Range	MHz	47 to 862      47 to 1000	3
Gain	dB	Selectable 28, 34, 40	
Flatness	dB	± 0.50      ± 0.75	4
Input Attenuator	dB	0 to 18 in 0.5 dB step	
Input Equalizer	dB	0 to 18 in 0.5 dB step	
Interstage Attenuator	dB	0 to 6 in 0.5 dB step	
Interstage Pre-equalizer	dB	0 to 15 in 0.5 dB step	
Input Test Point	dB	-20 ± 1.5	
Output Test Point	dB	-20 ± 0.50      -20 ± 0.75	
Number of Outputs	–	1 or 2	5
Return Loss	dB	> 18	4, 6
• Input, output port		> 20	
• Input, output test point			
Noise Figure	dB	7.0	5
Signal Feed Through Loss	dB	≤ 1.0	
Output Level @ 42 ch CENELEC	dB $\mu$ V	114	8, 9
• CTB ≥ 60 dB		114	
• CSO ≥ 60 dB			

Reverse	Units	Description	Notes
Frequency Range	MHz	5 to 65      5 to 200	3
Gain	dB	Selectable 20, 25	
Flatness	dB	± 0.5      ± 0.75	
Input Attenuators	dB	0 to 20 in 0.5 dB step	
Output Attenuators	dB	0 to 18 in 0.5 dB step	
Output Equalizer	dB	0 to 15 in 0.5 dB step	
Test Point	dB	-20 ± 0.5	
Signal Injection Point	dB	-20 ± 0.5	
Return Loss at Test Point	dB	> 20 @ 5 to 10 MHz > 23 @ 10 to 200 MHz	6
Return Loss at Input and Output	dB	> 18	6, 10
Output Level	dB $\mu$ V	117	111
• IMD3 ≥ 60 dB		112	
• IMD2 ≥ 60 dB			107
3-state Reverse Switch, EM controlled	–	On/-6 dB/Off	
Noise Figure	dB	≤ 7.5      ≤ 8.0	

Unless otherwise noted, all data given are for the amplifier with standard configuration for 1 output.

## Specifications, continued

Compliance/Safety		Description	
Electrical Safety	—	EN 50083-1 EN 60065 IEC 65	
EMC Emissions	—	EN 50083-2	
Environmental			
Operating Temperature Range	°C °F	-40 to +60 -40 to +140	
Mechanical			
Housing Dimensions (W x H x D)	mm in.	310 x 250 x 130 12.2 x 9.8 x 5.1	
Packaging Dimensions (W x H x D)	mm in.	293x139 x345 11.5x5.5 x13.6	
Weight	kg lbs	4.8 10.6	

### Notes:

1. According to IEC60 on input and output with diplex filters.
2. AC current draw is tested with 50 meters coaxial cable.
3. Frequency range depends on plug-in diplex filters and amplifier settings.
4. With diplex filters type A75130.106587
5. Two outputs that can be activated by using splitter or directional coupler.
6. At 40 MHz red. 1.5 dB/octave.
7. Maximum gain, no equalization.
8. With 6 dB interstage EQ
9. Change in CTB, CSO, and Noise Figure with different interstage attenuation, relative to 0 dB.

40 dB	CTB	CSO	Noise Figure
2 dB	1	2	0.1
4 dB	2	2	0.2
6 dB	2	2	0.3
34 dB	CTB	CSO	Noise Figure
2 dB	2	1	0.1
4 dB	3	1	0.2
6 dB	4	1	0.3
28 dB	CTB	CSO	Noise Figure
2 dB	1	1	0.2
4 dB	3	1	0.6
6 dB	4	1	1.0

10. Start from 7 MHz

AC Input Voltage (V)	24	30	35	40	45	50	55	60	65
AC Current Draw (A)									
Without transponder	1.24	1.00	0.87	0.78	0.71	0.65	0.60	0.57	0.54
With transponder	1.29	1.04	0.90	0.79	0.73	0.66	0.62	0.58	0.56

## Ordering Information

Un-configured Amplifier	Part Number
Compact EGC Outdoor Amplifier Model 93451, 862 MHz or 1 GHz, 28/34/40 dB, 65 V, Electronic adjustable Attenuator & Equalizer, PG11 at input/output, Plug-in Transponder	A93451.10340

Please note that some combinations are available on request only.

The following **Required Accessories** must be ordered separately.

Required Accessories	Part Number	Notes
Plug-in Diplex Filter –2 required, choose from below: • 30/47 MHz split • 42/54 MHz split • 65/87 MHz split	A75130.103047 A75130.104254 A75130.106587	
Plug-in Reverse Equalizer –1 required, choose from below: • 30 MHz reverse band • 42 MHz reverse band • 65 MHz reverse band	A74141.1030 A74141.1042 A74141.1065	
Plug-in at input – 1 required, choose from below: • 1 link 0 dB at input • 1 splitter 3.5/3.5 dB at input • 1 splitter 2/6 at input • 1 splitter 1/10.5 dB at input • 1 splitter 0.6/14 dB at input	A74089.10 A77041.10 A77042.10 A77043.10 A77044.10	
Plug-in at AUX – 1 required, choose from below: • 1 link 0 dB • 1 attenuator 2, 4, 6, 8, 10 or 12 dB (xx=02, 04, 06, 08, 10 or 12) • 1 equalizer 450/606/750/862/1000 MHz Tilt 3, 6, 9, 12, 15 dB • 1 inverse equalizer 862MHz -3, -6, -9 or -12 dB (xx=03, 06, 09 or 12)	A74069.10 A77150.100xx A74100.10xxx A74190.10xx	1
Plug-in at output – 1 required, choose from below: • 1 link 0 dB at output • 1 splitter 3.5/3.5 dB at output • 1 splitter 2/6 at output • 1 splitter 1/10.5 dB at output • 1 splitter 0.6/14 dB at output	A74069.10 A77041.10 A77042.10 A77043.10 A77044.10	
For more information on the above, see the “Compact Amplifier and Node Accessories” (P/N: A541441) data sheet.		

Please note that the required accessories are only relevant for un-configured amplifiers.

The following **Optional Accessories** may be ordered separately.

Optional Accessories	Part Number
Voltage Lock-Out Module, 24 or 35 V *	A75018.00xx
Plug-in Compact SMC Transponder	A91051.12
Plug-in Compact HMS Transponder	A91063.10
For additional information on the status monitoring transponders, see the “Compact Transponder” (P/N: 7006287) data sheet.	
*The 35 V Lock-Out Module is standard with all 90 V Power Supplies.	

### Notes:

- Plug-in Equalizer at AUX. ordering matrix.

Frequency A74100.10xxx Tilt (dB)	Frequency (MHz)			
	450	606	750	862
3	N/A	A74100.10603	N/A	A74100.10803
6	A74100.10406	A74100.10606	A74100.10706	A74100.10806
9	A74100.10409	A74100.10609	A74100.10709	A74100.10809
12	A74100.10412	A74100.10612	A74100.10712	A74100.10812
15	N/A	A74100.10615	N/A	N/A





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