

# Transponder for GainMaker® Amplifiers

## Description

This full frequency agile transponder is designed to interface with Scientific-Atlanta's GainMaker® System Amplifier and Line Extenders. It is controlled by Scientific-Atlanta's ROSA™ Element Manager (EM) and Transmission Network Control System (TNCS) element management systems.

The transponder monitors the operational parameters of the amplifier station and allows remote control of certain amplifier functions. Communications to and from the transponder are accomplished via the built in forward RF data carrier receiver and reverse RF data carrier transmitter.

The transponder communicates with the ROSA EM and TNCS element management systems via the Phoenix™ RF Modem. The cutting-edge RF technology used in the Phoenix modem allows operation in networks that suffer from a high level of ingress noise in the return path.

The transponder monitors a wide range of operational parameters, including:

- Station temperature
- Station operational mode (AGC or Thermal)
- Amplifier type
- AC and DC power supply voltages

If the status of any monitored parameter is outside of established thresholds an alarm can be activated by the centrally located element management console. All alarm thresholds are remotely adjustable from the console. The transponder also enables remote control of the reverse "On/-6 dB/Off" RF switches (for remote isolation of ingress) and of the power supply.

The GainMaker transponder is packaged in an aluminum housing that mounts in the lid of the amplifier. The input, output, and power cables that interface between the transponder and amplifier are easily routed and plugged into quick connect sockets. A flat-blade screwdriver is the only tool required to mount the transponder. Once installed, LEDs on the transponder indicate; "Power On", "Receiving Data", and / or "Error" condition.

This transponder is easily configured for operation with the use of a Handheld Programmer Terminal. Configuration can be performed either on the bench or in the field, prior to installation.

## Features

- "Plug-in" compatibility with the GainMaker amplifiers
- Frequency agile 5 to 65 MHz for reverse path
- Frequency agile 45 to 174 MHz for forward path
- Monitors all critical internal station parameters
- Controls all switches within the node
- Simple and efficient installation
- Wide operating temperature range



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## Specifications

### Agile Transmitter

| Parameter                           | Specification | Units | Notes                                     |
|-------------------------------------|---------------|-------|-------------------------------------------|
| Carrier frequency                   | 5 - 65        | MHz   | Remotely adjustable                       |
| Frequency step size                 | 50            | kHz   |                                           |
| Modulation type                     | FSK           | -     |                                           |
| Deviation                           | ± 67          | kHz   |                                           |
| Occupied bandwidth                  | 400           | kHz   |                                           |
| RF output level                     | 24 to 50      | dBmV  | Remotely adjustable                       |
| Output level step size              | 2.0           | dB    |                                           |
| Level stability                     | < ±2.0        | dB    | Over full temperature and frequency range |
| Frequency stability                 | ± 7.5         | kHz   | Over full temperature and frequency range |
| Spurious and harmonics (5-2000 MHz) | > 55          | dBc   |                                           |
| Extinction ratio                    | > 60          | dBc   | From operational output level             |

### Agile Receiver

| Parameter                           | Specification | Units | Notes                                                                                                                                                      |
|-------------------------------------|---------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Receive carrier frequency           | 45-174        | MHz   | Remotely adjustable                                                                                                                                        |
| Frequency step size                 | 50            | kHz   |                                                                                                                                                            |
| RF input level range                | -25 to 20     | dBmV  |                                                                                                                                                            |
| Selectivity at frequency offset of: |               |       | Specifies the amount an adjacent carrier's level can exceed the transponder receive carrier's level at the transponder input, without causing interference |
| 200 kHz                             | +30           | dBc   |                                                                                                                                                            |
| 400 kHz                             | +40           | dBc   |                                                                                                                                                            |
| 800 kHz                             | +50           | dBc   |                                                                                                                                                            |

### Environmental Specifications

| Parameter             | Specification | Units | Notes          |
|-----------------------|---------------|-------|----------------|
| Operating Temperature | -40 to +85    | °C    |                |
| Humidity              | 0 to 90       | %     | Non Condensing |

### Monitored Parameters

| Device                    | Units   | Parameter                                                                                     |
|---------------------------|---------|-----------------------------------------------------------------------------------------------|
| Amplifier Temperature     | °C / °F | Internal Temperature                                                                          |
| Transponder Data Carrier  | dBmV    | RF Input Level                                                                                |
| Station AGC Mode          | -       | Operational Mode (Auto or Thermal)                                                            |
| Power Supply              | V AC    | AC Input Voltage                                                                              |
| Power Supply              | V DC    | DC Output Voltage                                                                             |
| Tamper Switch             | -       | Housing Open or Closed                                                                        |
| Amplifier Model Indicator | -       | High Gain Dual, Low Gain Dual, High Gain Balanced Triple, Unbalanced Triple, or Line Extender |

### Controllable Parameters

| Device               | Control Variables |
|----------------------|-------------------|
| Main Reverse Switch  | Normal/-6 dB/Off  |
| Aux 1 Reverse Switch | Normal/-6 dB/Off  |
| Aux 2 Reverse Switch | Normal/-6 dB/Off  |

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## Ordering Information

| Description                                                          | Part Number |
|----------------------------------------------------------------------|-------------|
| GainMaker Transponder - one required per node                        | 715980      |
| Handheld Programmer Terminal – required to configure the transponder | A91200.10   |
| Programmer Software Download Kit                                     | A91210.10   |

| Phoenix RF Modem                                 | Part Number        |
|--------------------------------------------------|--------------------|
| <b>Tx (1), Rx (1)</b>                            |                    |
| Phoenix 110/220 V AC EU, Tx (1) and Rx (1)       | V9528341           |
| Phoenix 110/220 V AC UK, Tx (1) and Rx (1)       | V9528342           |
| Phoenix 110/220 V AC AUS, Tx (1) and Rx (1)      | V9528343           |
| Phoenix 110/220 V AC US, Tx (1) and Rx (1)       | V9528082           |
| <b>Tx (1), Rx (2)</b>                            |                    |
| Phoenix 110/220 V AC EU, Tx (1) and Rx (2)       | V9528344           |
| Phoenix 110/220 V AC UK, Tx (1) and Rx (2)       | V9528345           |
| Phoenix 110/220 V AC AUS, Tx (1) and Rx (2)      | V9528347           |
| Phoenix 110/220 V AC US, Tx (1) and Rx (2)       | V9528346           |
| <b>Tx (1), Rx (4)</b>                            |                    |
| Phoenix 110/220 V AC EU, Tx (1) and Rx (4)       | V9528348           |
| Phoenix 110/220 V AC UK, Tx (1) and Rx (4)       | V9528349           |
| Phoenix 110/220 V AC AUS, Tx (1) and Rx (4)      | V9528351           |
| Phoenix 110/220 V AC US, Tx (1) and Rx (4)       | V9528350           |
| <b>Tx (1), Rx (8)</b>                            |                    |
| Phoenix -48 V DC, Combicon, Tx (1) and Rx (8)    | V9523551           |
| Phoenix -48 V DC, Mate-N-Lock, Tx (1) and Rx (8) | 4002043            |
| Phoenix 110/220 V AC EU, Tx (1) and Rx (8)       | V9523552           |
| Phoenix 110/220 V AC UK, Tx (1) and Rx (8)       | V9528338           |
| Phoenix 110/220 V AC AUS, Tx (1) and Rx (8)      | V9528340           |
| Phoenix 110/220 V AC US, Tx (1) and Rx (8)       | V9528339           |
| <b>Phoenix Options</b>                           | <b>Part Number</b> |
| Phoenix Receiver Kit (one receiver)              | 4002230            |

## Ordering Information, continued

| <b>ROSA EM – North and Latin America</b>                 | <b>Part Number</b> |
|----------------------------------------------------------|--------------------|
| <b>ROSA EM – AC Version</b>                              |                    |
| ROSA EM, 100 - 240 V AC US, DCL Class 1 (0-10 devices)   | 4005326            |
| ROSA EM, 100 - 240 V AC US, DCL Class 2 (0-25 devices)   | 4005370            |
| ROSA EM, 100 - 240 V AC US, DCL Class 3 (0-50 devices)   | 4005371            |
| ROSA EM, 100 - 240 V AC US, DCL Class 4 (0-100 devices)  | 4005372            |
| ROSA EM, 100 - 240 V AC US, DCL Class 5 (0-250 devices)  | 4005373            |
| ROSA EM, 100 - 240 V AC US, DCL Class 6 (0-500 devices)  | 4005374            |
| ROSA EM, 100 - 240 V AC US, DCL Class 7 (0-750 devices)  | 4005375            |
| ROSA EM, 100 - 240 V AC US, DCL Class 8 (0-1000 devices) | 4005376            |
| <b>ROSA EM – DC Version</b>                              |                    |
| ROSA EM, -48 V DC US, DCL Class 1 (0-10 devices)         | 4006322            |
| ROSA EM, -48 V DC US, DCL Class 2 (0-25 devices)         | 4007210            |
| ROSA EM, -48 V DC US, DCL Class 3 (0-50 devices)         | 4007211            |
| ROSA EM, -48 V DC US, DCL Class 4 (0-100 devices)        | 4007212            |
| ROSA EM, -48 V DC US, DCL Class 5 (0-250 devices)        | 4007213            |
| ROSA EM, -48 V DC US, DCL Class 6 (0-500 devices)        | 4007214            |
| ROSA EM, -48 V DC US, DCL Class 7 (0-750 devices)        | 4007215            |
| ROSA EM, -48 V DC US, DCL Class 8 (0-1000 devices)       | 4007216            |

| <b>ROSA EM – EMEA (Europe, Middle-East, Asia)</b>                                   | <b>Part Number</b> |
|-------------------------------------------------------------------------------------|--------------------|
| <b>ROSA EM Headend</b>                                                              |                    |
| ROSA EM Headend, 100 – 240 V AC EU DCL Class 5 (0-250 headend devices)              | 4005317            |
| ROSA EM Headend, 100 – 240 V AC UK DCL Class 5 (0-250 headend devices)              | 4005320            |
| ROSA EM Headend, 100 – 240 V AC AUS DCL Class 5 (0-250 headend devices)             | 4005323            |
| ROSA EM Headend, -48 V DC DCL Class 5 (0-250 headend devices)                       | 4007217            |
| <b>ROSA EM Hub &amp; HFC</b>                                                        |                    |
| ROSA EM Hub & HFC, 100 – 240 V AC EU DCL Class 6 (0-500 Hub & HFC network devices)  | 4005318            |
| ROSA EM Hub & HFC, 100 – 240 V AC UK DCL Class 6 (0-500 Hub & HFC network devices)  | 4005321            |
| ROSA EM Hub & HFC, 100 – 240 V AC AUS DCL Class 6 (0-500 Hub & HFC network devices) | 4005324            |
| ROSA EM Hub & HFC, -48 V DC DCL Class 6 (0-500 hub & HFC network devices)           | 4007218            |
| <b>ROSA EM Transmitter sites</b>                                                    |                    |
| ROSA EM Tx Site, 100 – 240 V AC EU DCL Class 1 (0-10 devices in transmitter sites)  | 4005319            |
| ROSA EM Tx Site, 100 – 240 V AC UK DCL Class 1 (0-10 devices in transmitter sites)  | 4005322            |
| ROSA EM Tx Site, 100 – 240 V AC AUS DCL Class 1 (0-10 devices in transmitter sites) | 4005325            |
| ROSA EM Tx Site, -48 V DC DCL Class 1 (0-10 devices in transmitter sites)           | 4007219            |

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## Ordering Information, continued

| ROSA EM Upgrades                                                                                                                                                                                                                                                 | Part Number |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| ROSA EM Device Count License (DCL) Upgrade                                                                                                                                                                                                                       | 4005377     |
| Class Info<br>DCL Class 1 : 0-10 devices<br>DCL Class 2 : 0-25 devices<br>DCL Class 3 : 0-50 devices<br>DCL Class 4 : 0-100 devices<br>DCL Class 5 : 0-250 devices<br>DCL Class 6 : 0-500 devices<br>DCL Class 7 : 0-750 devices<br>DCL Class 8 : 0-1000 devices |             |

| ROSA EM Options                                                                        | Part Number |
|----------------------------------------------------------------------------------------|-------------|
| ROSA EM external temperature sensor, maximum 2 per ROSA EM (cable length 15 m / 50 ft) | 4005382     |



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Europe & Asia  
+32 56 445 000 or +49-6173-928-0  
[www.saeurope.com](http://www.saeurope.com)  
Americas  
1-800-722-2009 or 770-236-6900  
[www.scientificatlanta.com](http://www.scientificatlanta.com)

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