

# ClearGain® Dual Inline TMAs

Europe, Middle East, Africa



As mobile usage continues to increase, service providers are faced with the challenge of optimizing and expanding their wireless networks to provide new and existing services. ADC's ClearGain® Tower-Mounted Amplifiers (TMAs) minimize the cost of network expansion and improve the quality of service, allowing carriers to increase profitability from new and existing services.

ClearGain TMAs improve signal quality by boosting the uplink (RX) signal of a mobile system immediately after the antenna. This compensates for the loss in signal strength that occurs when the signal is passed through the coaxial feeder cable to the base transceiver station (BTS) at the base of the tower. These TMAs perform this amplification with the lowest possible noise contribution, resulting in a substantial increase in receiver performance and an improvement in overall coverage. These improvements in quality of service allow mobile subscribers to place more calls, make longer calls, and successfully complete calls in an expanded geographic area, resulting in increased revenue.

## Benefits

- Small size and low weight. Allows for easy installation with minimal visual impact and in weight-restricted implementations.
- Improved uplink coverage. TMAs enable base stations to receive mobile signals more clearly in a wider coverage area than could otherwise be achieved.
- Increased RF performance. By improving signal quality and/or reducing mobile phone power transmission, TMAs provide more successful call attempts, a reduction in dropped calls, maximized data rate, improved call quality and the extension of handset battery life.

SPEC SHEET



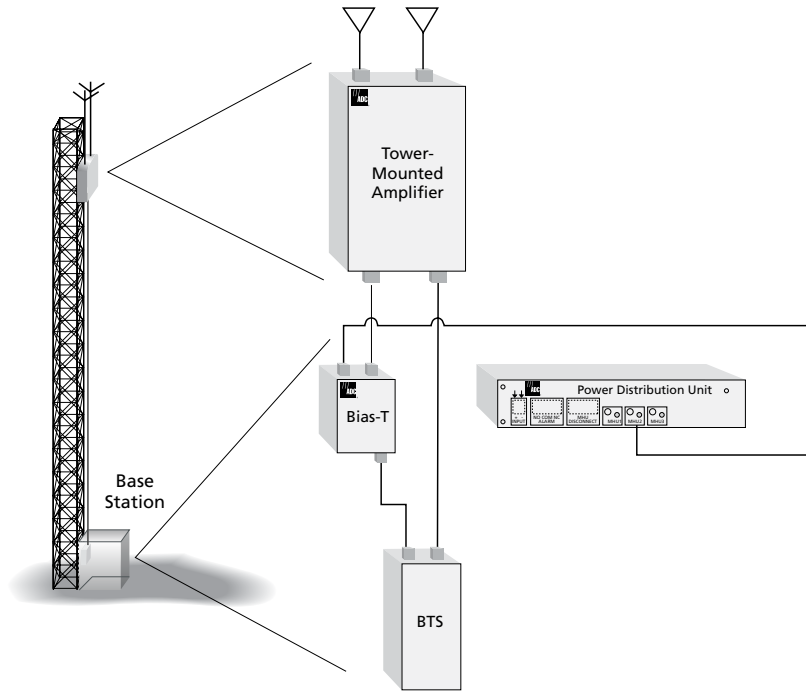
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# ClearGain® Dual Inline TMAs

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The ClearGain Dual Inline Masthead Units (MHU) allows for mounting of the equipment to serve two RX paths in one location on the tower, reducing time and expense in mounting the TMA. The inline feature also allows for easier connection of the jumper cables to the antenna. A ClearGain TMA system is modular, consisting of both a MHU and a power distribution unit (PDU), providing full compatibility with all base stations. Due to its exposed installation, the TMA is designed to withstand demanding weather conditions and features lightning protection, fault monitoring, and a fail-safe bypass circuitry system.



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## DD1800 Dual Inline Masthead Unit Typical Specifications

### ELECTRICAL

Nominal Impedance of RF Inputs and Outputs:	50 Ohm
Frequency Range	
TX:	1805 – 1880MHz
RX:	1710 – 1785MHz
Passband (RX)	
Gain:	12db
Noise Figure:	≤1.6dB
Dynamic Range:	
Input at 1 DB Gain Compression:	+13dBm
Output IP3:	+25dBm
Bypass Insertion Loss:	≤2.0dB
Isolation in TX Path:	>40dB
Insertion Loss of TX Path (TX to ANT):	0.7dB
Passband Return Loss	
TX Band:	18dB
RX Band:	18dB
RX Rejection in TX Band:	>80dB @ ANT, >70dB @ BTS
Intermodulation:	-115 dBm

### PHYSICAL

Dimensions (HxWxD):	336 mm x 191 mm x 95 mm
Weight:	6.90kg
Housing:	Aluminum

### CONNECTORS

Antenna Connector:	7/16 DIN Female
BTS Connector:	7/16 DIN Female

### ENVIRONMENTAL

Operating Temperature:	-40°C to +60°C
Lightning Protection:	BTS Port 10kA 8/20us
ANT Port 10kA 8/20us	

### VIBRATION

Storage:	ETS3019-1-1
Transport:	ETS3019-1-2
Operation:	ETS3019-1-4 Class 4.1E

### REGULATORY

EMC:	ETS 300 342-3
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### APPROVALS

AISG:	AISG 1.1
CE:	Per IEC 61000 and IEC 60950

### QUALITY

MTBF:	500,000 hours
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# ClearGain® Dual Inline TMAs

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## DD2100 Dual Inline Masthead Unit Typical Specifications

### ELECTRICAL

Nominal Impedance of RF Inputs and Outputs:	50 Ohm
Frequency Range	
TX:	2110 – 2170MHz
RX:	1920 – 1980MHz
Passband (RX)	
Gain:	12db
Noise Figure:	≤1.4dB
Dynamic Range:	
Input at 1 DB Gain Compression:	+13dBm
Output IP3:	+25dBm
Bypass Insertion Loss:	≤2.0dB
Isolation in Tx Path:	>80dB
Insertion Loss of TX Path (TX to ANT):	0.5dB
Passband Return Loss	
Tx Band:	18dB
Rx Band:	18dB
Rx Rejection in Tx Band:	>50dB

### PHYSICAL

Dimensions (HxWxD):	210mm x 166mm x 81 mm
Weight:	4.5kg
Housing:	Aluminium

### CONNECTORS

Antenna Connector:	7/16 DIN Female
BTS Connector:	7/16 DIN Female

### ENVIRONMENTAL

Operating Temperature:	-40°C to +60°C
Lightning Protection:	BTS Port 10kA 8/20us ANT Port 10kA 8/20us

### VIBRATION

Storage:	ETS3019-1-1
Transport:	ETS3019-1-2
Operation:	ETS3019-1-4 Class 4.1E

### REGULATORY

EMC:	ETS 300 342-3
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### APPROVALS

AISG:	AISG 1.1
CE:	Per IEC 61000 and IEC 60950

### QUALITY

MTBF:	500,000 hours
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CG000000DMDF00



CG000000DFDM00



CG000000NMNF00



CG000000NFM00

## Bias-T Units

As part of ADC's modular ClearGain Tower-Mounted Amplifier (TMA) system, the ClearGain Bias-T Unit can be used indoors and outdoors in conjunction with the ClearGain Power Distribution Unit (PDU) to extend DC power, alarm and monitoring information between the PDU and the TMA. The Bias-T Unit, also known as the DC current injector, inserts DC power into the coaxial cable and extracts signals from the alarm and monitor circuits. ADC's Bias-T Unit is configured as a kit that includes the Bias-T Unit with standard international connectors, 3 meters of DC cable, and 1.5 meters of Grounding cable.

## Typical Specifications

### PRODUCT CONFIGURATION

**Main path connectors:**

**DC injection/Sample port connector:**

**Mounting and grounding:**

7/16 DIN or N-Connectors

TNC jack (female)

/M8/brk (MH - bulkhead mounting/

M - screw/brk - bracket)

### TECHNICAL DATA

**Impedance:**

**Frequency range:**

**Return loss:**

**Insertion loss:**

**RF CW power:**

**PIM 3rd order:**

**Surge current handling capability:**

**Operating temperature:**

**Waterproof degree:**

**DC injection / DC bypass current:**

**DC supply / DC bypass voltage:**

**MTBF:**

**Size:**

**Weight:**

50 ohms

800 to 2200 MHz

> 19 dB

< 0.2 dB

500 W

< -108 dBm

3 kA single

-40°C to + 65°C (-40°F to 149°F)

IP 65

< 2 A

< 48 V

600,000 hours

55 mm x 95 mm x 40 mm (2.17" x 3.74" x 1.57")

0.3 kg (.66 lb)



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## Dual Inline Power Distribution Unit

Time and space are important considerations when selecting and installing wireless components at base transceiver station sites. The simple, compact design of ADC's ClearGain Power Distribution Unit (PDU) is intended to help service providers save both. From a compact unit that is easily mounted on a wall or in a rack, the ClearGain PDU provides power and alarming for up to three ClearGain Tower-Mounted Amplifiers.

### Features:

- Provides power and alarm functions for on-site monitoring of up to three dual-inline masthead units (MHUs)
- Monitors condition of feeder cable
- Wall or rack-mountable to fit available space
- LED indicators for alarm functions
- Simple, compact design allows for easy installation and connections
- AISG compliant

The ClearGain Dual Inline PDU is an integrated unit that provides power and alarm functions for the ClearGain TMA system. The PDU monitors the current of the MHU. If an MHU fails, the ClearGain Dual Inline PDU gives an alarm indication. The ClearGain Dual Inline PDU also monitors the condition of the feeder cable. Alarm indicators identify failure in the feeder cable or MHUs and in which MHU the failure occurred, providing fast and easy on-site diagnostics. The flexible design of the ClearGain Dual Inline PDU allows it to be rack-mounted or mounted indoors on the wall or on the side of a BTS cabinet.



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## Dual Inline Power Distribution Unit Typical Specifications

### ELECTRICAL

**Input Voltage:** 20-56 Vdc positive/negative ground  
**Output Voltage:** 3x16 Vdc each  
**Maximum Current Draw:** 3A

### PHYSICAL

**Dimensions (HxWxD):** 43 x 196 x 103 mm  
**Weight:** 1 kg  
**Color:** Silver

### CONNECTORS

**Output for MHUs:** SMB, male (qty 3)  
**Power Connector:** 4-pin male  
**General Alarm Connector:** 3-pin male  
**General Communications Connector:** 3-pin male

Indicators Green OK/NOK LEDs  
 Red General Alarm LED

### ALARM OUTPUT

Alarm output is isolated 3-pin relay connection. Normally open and normally closed connection available.

### ENVIRONMENT

**Storage:** ETS3019-1-1  
**Transportation:** ETS3019-1-2  
**Operation:** ETS3019-1-3  
**Housing:** IP40  
**Temperature Range (Indoor Use):** -20°C to +65°C  
**Lightning Protection:** IEC 1000-4-5 EMC

### APPROVALS:

CE

### QUALITY

**MTBF:** 250,000  
 Manufactured under ISO 9001 quality system

### ACCESSORIES

**Basic Accessories:** Power supply cable (10 m), alarm cable (10 m), communications cable (10 m), grounding cable (2 m) and wall mounting screws

### Optional Accessories:

Mounting hardware for 19" rack mount

## Ordering Information

Description	Catalog Number
<b>ClearGain Dual Inline TMAs</b>	
1800 MHz	CG1800DDI75DT00
2100 MHz	CG2100DDI60DDFM
<b>ClearGain Single PDU Kit</b> – Includes power cable and grounding cable	CG000000000PFM
<b>Bias-T Kits*</b>	
7/16 DIN male to BTS, 7/16 DIN female to ANT	CG0000000DFDM00
7/16 DIN female to BTS, 7/16 DIN male to ANT	CG0000000DMDF00
N male to BTS, N female to ANT	CG0000000NFM00
N female to BTS, N male to ANT	CG0000000NMNF00

\*Bias-T, DC Cable 3 meters (SMB to TNC), Grounding Cable 1.5 meters (one end terminated)

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## Creating a Bill of Materials

A typical site includes three components in various quantities.

### You have two TMA options:

- |                    |                        |
|--------------------|------------------------|
| 1. CG1800DDI75DT00 | 1800DD Dual Inline TMA |
| 2. CG2100DDI60DDFM | 2100DD Dual Inline TMA |

The TMAs include:

- Mounting hardware
- Grounding lug

Ordering information: Order one per sector

### You have four Bias-T options (based on connector type and orientation):

- |                    |  |
|--------------------|--|
| 1. CG0000000DFDM00 | DIN Male to BTS Port, DIN Female to ANT Port |
| 2. CG0000000DMDF00 | DIN Female to BTS Port, DIN Male to ANT Port |
| 3. CG0000000NFM00  | N Male to BTS Port, N Female to ANT Port     |
| 4. CG0000000NMNF00 | N Female to BTS Port, N Male to ANT Port     |

The Bias-Ts include:

- Grounding cable/strap (length 1.5 meters)
- Bias-T cable; go from Bias-T to the PDU (length 14 feet)

Ordering information: Order one per sector

### You have one PDU option:

- |                   |                 |
|-------------------|-----------------|
| 1. CG000000000PFM | Dual Inline PDU |
|-------------------|-----------------|

The PDU includes:

- Mounting Hardware
- Power Cable (length 10 meters)
- Alarm Cable (length 10 meters)
- Grounding Cable/strap (length 1.5 meters)

Ordering information: Order one per site

### Optional Accessories:

Longer Bias-T Cable CG-PDU-30CABLE (30 foot Bias-T cable)  
PDU Rack Mounting Brackets AUX-000076 (19" rack mounting bracket)  
AUX-000076 and EB-17P (23" mounting bracket)  
AUX-000084 (Siemens cabinet mounting bracket)

SPEC SHEET



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