

## Air Interface Adapter AIAD-4/2-DLU4/1

MTS-No.: 60.90.0440

### Application

With the MTS AIAD-4/2-DLU4/1 you can emulate the air interface of smart antennas. To avoid the influence from the live net, the signals are connected with cables directly from the different signal sources, as for example WiMAX base stations or signal generators etc. over the MTS AIAD-4/2-DLU4/1 to the mobile devices.

### Description

The AIAD-4/2-DLU4/1 consists of two parts:

1.) 2x DLU4/1-part:

This part can emulate two 4-section-smart-antennas with adjustable receiving directions by programmable delay lines.

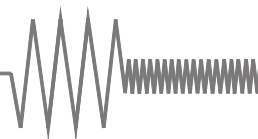
2.) AIAD-4/2-part:

To emulate the attenuation in different scenarios, one attenuation network with 4 inputs and 2 outputs is included. It allows program controlled attenuation of each input signal to each output signal at the same time. As a specific feature one 2-to-1-combiner of the network can be accessed external by connectors on the front panel.



### Characteristics

- ▶ 2x4 signals can be delayed separately. The delay times can be adjusted from 0 to 1200 ps directly with 5 ps step size. Each 4 delayed signals are combined to one output.
- ▶ The receiving angles can be moved to emulate mobile devices at different places by appropriate adjustment of the delay times.
- ▶ Alternatively other smart antenna configurations can be emulated by combining both 4-to-1 delay line units to one 8-to-1 delay line unit by external patch cables (available on request).
- ▶ A windows control software is available on request. It allows the direct adjustment of the emulated receiving angles of the smart antenna. The calculation of the delay times assumes 4-section antenna line arrays with  $\lambda/2$  distance of the partial antennas, depending on the adjusted frequency and within the max. delay time.
- ▶ Frequency range from 500 MHz to 5800 MHz
- ▶ Adjustable attenuation from 0 to 93 dB with 1 dB steps
- ▶ Control by LAN-interface
- ▶ Input power up to 24 dBm (CW) at 25° C
- ▶ High switching reliability
- ▶ High quality materials and components for extended durability
- ▶ Smart Antenna Emulators can be designed according to customers individual requirements



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### Configuration:

4 inputs coupled to 2 outputs through 93 dB attenuators and 2x 4/1 delay lines

### Technical data:

#### 1 RF-specifications: AIAD-4/2-part

1.1	Frequency range	500 MHz – 5800 MHz
1.2	Insertion loss	24 dB max. from MSx to BTSx (at 0 dB attenuation)
1.3	VSWR In (MS)	2,0 : 1 max.
1.4	VSWR Out (BTS)	2,5 : 1 max.
1.5	RF-connections	N-female
1.6	Switching time	50 µs max.
1.7	Impedance	50 Ω
1.8	Input power	+24 dBm max.
1.9	Attenuation	0 dB – 93 dB in 1 dB step
1.10	Gradation	1 dB / 2 dB / 4 dB / 8 dB / 16 dB / 30 dB / 32 dB
1.11	Setting accuracy	1 dB                    ±0,4 dB 2 dB                    ±0,8 dB 3 dB - 9 dB          ±1,0 dB 10 dB - 29 dB       ±1,5 dB 30 dB - 69 dB       ±3,0 dB 70 dB - 79 dB       ±3,0 dB 80 dB - 89 dB       -3,0 dB / +6,0 dB 90 dB - 93 dB       ±6,0 dB
1.12	Linearity	± 3,8 dB

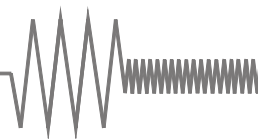
#### Splitter / Combiner

ΣAnt. El. x to Σ x

1.13	Insertion loss	5 dB max. from ΣAnt. El. x to Σ x (at 0 dB attenuation)
1.14	VSWR In (ΣAnt. El x)	1,7 : 1 max.
1.15	VSWR Out (Σ x)	1,7 : 1 max.
1.16	Isolation IN/IN	17 dB min.
1.17	RF-connections	N-female
1.18	Impedance	50 Ω
1.19	Input power	+33 dBm max.

#### 2 RF-specifications: DLU4/1-part

2.1	Frequency range	1800 MHz – 5800 MHz
2.2	Insertion loss	30 dB typ., 42 dB max. from ΣAnt. El x to Ant. El. x
2.3	VSWR In	2,7 : 1 max.
2.4	VSWR Out	2,7 : 1 max.
2.5	Isolation IN/IN	45 dB min.
2.6	RF-connections	N-female
2.7	Impedance	50 Ω
2.8	Input power	+26 dBm max.
2.9	Adjustable delay time	1200 ps (240 steps)
2.10	Delay time step size	5 ps
2.11	Delay time accuracy	±10 ps approx.
2.12	Dispersion (1-4 GHz)	-0,0007 x (total delay)
2.13	Linearity	±0,8 dB max. (1,8 to 3 GHz) ±0,9 dB max. (3 to 5 GHz) ±1,0 dB max. (5 to 5,8 GHz)
2.14	Differential loss between arbitrary delay state	±0,3 dB max. (1,8 to 3 GHz) ±0,5 dB max. (3 to 5 GHz)



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### Technical data

#### 3 Connections:

- |     |            |  |
|-----|------------|--|
| 3.1 | Front side | Power supply switch with integrated control lamp<br>RF-connections   |
| 3.2 | Rear side  | Power supply<br>Control card<br>Appliance plug with the integrated fuses F1 and F2<br>Ground connector<br>Control interfaces |

#### 4 General specifications:

- |      |  |   |
|------|--|---|
| 4.1  | Power supply                             | 100 V – 240 V<br>50 Hz / 60 Hz  |
| 4.2  | Internal voltage                         | +5 V DC   |
| 4.3  | Control displays                         | Control lamp in power switch<br>Control-LED for 5 V DC at the power supply unit |
| 4.4  | Control interfaces                       | LAN<br>RS-232 (only for configuration of the LAN interface)                     |
| 4.5  | Power consumption primarily              | 50 mA @ 230 V   |
| 4.6  | Voltage supply                           | Power plug (IEC 320)  |
| 4.7  | Operating temperature                    | 0 °C – +50 °C   |
| 4.8  | Reference temperature for specifications | +25 °C  |
| 4.9  | Dimensions                               | 19"-unit x 6 HU x 370 mm<br>(dimensions without handles and connections)        |
| 4.10 | Colour                                   | Front side: colourless anodized<br>Rear side: colourless anodized               |
| 4.11 | Weight                                   | 14 kg   |

#### 5 Delivered parts:

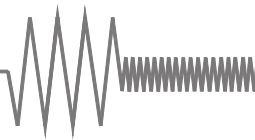
- AIAD-4/2-DLU4/1
- Power cable
- Operating manual (on CD)

#### 6 Comments:

- |                |           |
|----------------|-----------|
| Warranty       | 12 months |
| RoHS-compliant | No        |

#### 7 Recommended accessories:

- |        |  |
|--------|--|
| DLU4/1 | Optional extension, 2x 4 delay lines, controller card from unit is prepared for a second DLU4/1 unit |
|        | Shielding box of the series MSB-02xx   |
|        | RF-cables  |



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## Views:

