Manual

Air Interface Adapter
500 MHz - 6000 MHz

AIAD-8x2/1-6G

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DIN EN ISO 9001:2015 – certified

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Air Interface Adapter 500 MHz - 6000 MHz AIAD-8x2/1-6G

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Checked: M. Osenberg ..... *M. Osenberg*

Released: M. Demharter ..... *M. Demharter*

Alteration Chart

Release no.	Version	Unit state	Description of changes	Date	Editor
1	1.0	00	First edition	04 May 2020	M. Demharter
2	2.0	00	Add Group+Block function	26 November 2020	M. Demharter
3	2.1	00	Additional descritpion at “Overv” – just attenuators	02 December 2020	M. Osenberg
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1 GENERAL

1.1 General description

This manual describes the Air Interface Adapter named "AIAD-8x2/1-6G" unit state 00 and higher.

The Air Interface Adapter consists of a colour display with touchpanel, variable attenuators, combiners, a power supply and a control card.

The control card BK-AVR2560 interprets the commands from the manual control, the RS-232-interface and the LAN-interface and controls the attenuators.

1.2 Delivered parts

- Air Interface Adapter
- Power cable
- Operating manual on CD

1.3 Safety precautions

During operation of the unit the general safety precautions according to VDE 0100, VDE 0800 and VDE 0805 are to be obeyed.

Attention: In order to avoid touching the voltage loaded parts,
d o n o t o p e n the unit!

Repairs of the device are permitted to authorized personnel only.
It is absolutely forbidden to use defective units!

The device must be grounded at all times!

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1.4 Components of the front panel

1 RF-connections of the outputs
2 Colour display with touchpanel
3 Power switch S1 for 230V AC-supply with integrated control lamp

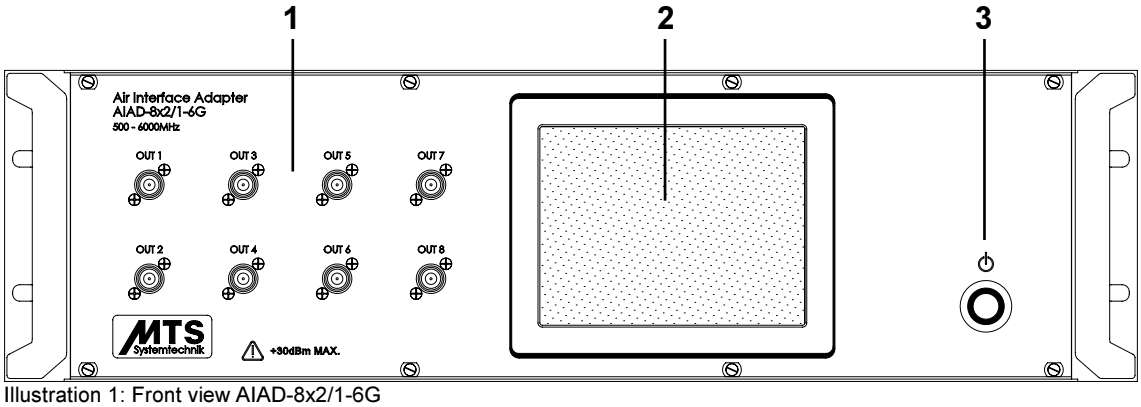

Illustration 1: Front view AIAD-8x2/1-6G

1.5 Components of the rear panel

1 Appliance plug with integrated fuses F1 and F2
2 Ground connector
3 RF-connections of the inputs
4 Control card BK-AVR2560 with RS-232-interface and LAN-interface

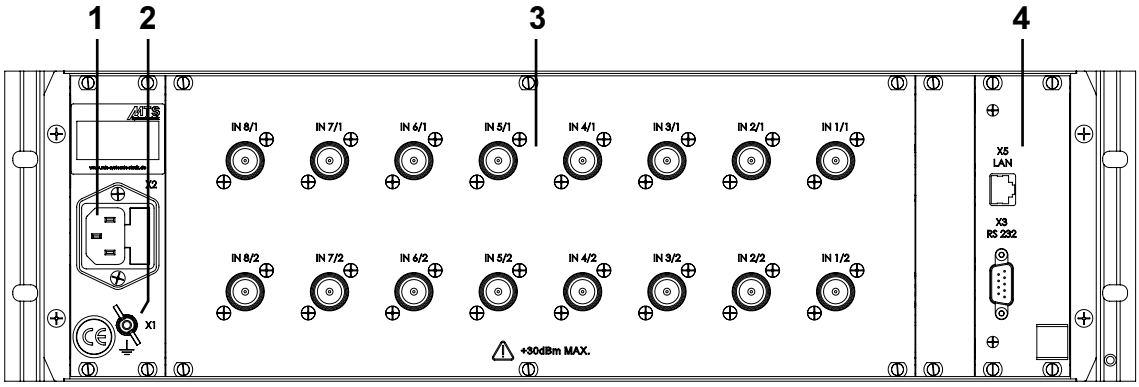

Illustration 2: Rear view AIAD-8x2/1-6G

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1.6 Starting up and operating / connections

Before using the unit following connections have to be done:

Ground-connection

The unit has to be grounded expertly at the ground connector (look at illustration 2, position 2). A cable with a conductor cross-section of minimum 1.5 mm² has to be used.

Power supply

The power supply voltage range of the unit is 100 V - 240 V at 50 Hz / 60 Hz at connector X2 (look at illustration 2, position 1).

RF-connections

Cables and RF-connectors N female at the inputs and TNC female at the outputs with an impedance of 50 Ω are required.
Cables can be connected without RF-power during the operation.

Interface connection

In order to operate the device by remote control, a data cable has to be connected.

Attention: Before connecting the data cable, the device has to be shut off at power switch S1.

Check all connections for correct hook up,
before turning the power on.

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1.7 Starting up and operating / turning off and turning on

You can do a reset of the unit by switching off the power switch S1 at the front panel. After waiting at least 30 seconds and turning on the unit it will boot again and then it will work normally.

The control card detects voltage errors of the power supplies. While the error is present it is not possible to save any adjustment. At disappearing of a voltage error, the error message changes into a voltage warning. Saving of adjustments is now enabled again. Dependent on the power consumption of the components possibly a voltage error is shown at shutdown.

On starting the unit or returning of power (if the power switch is on) all variable attenuators will switch to 95 dB.

No blocking or group functions are activated after starting the unit.

Attention: Before starting make sure the unit is standing safely or is build-in safely.

The operating temperature of the unit has to be between 0 °C and +50 °C.

Attention: By ignoring the rules of handling the Group+Block function of MTS devices there is no guarantee of correct work.

For further information about Group+Block refer to MTS manual 26401.

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2 CONTROLLING OF THE UNIT

After switching power on the display shows the address of the manufacturer for a short time. Then the device automatically starts the operating mode. Now it is possible to control the unit by the touchpanel, the RS-232-interface or the Ethernet-interface.

2.1 Updating the unit

The unit consists of a module for updating the firmware. Updating the firmware is exclusively allowed under guidance of MTS Systemtechnik GmbH.

2.2 Changing LOCAL to REMOTE

The unit starts at LOCAL mode. It changes into REMOTE mode automatically when receiving the first REMOTE set command. All REMOTE-interfaces have equal rights. Its commands are executed in the same order as received.

During the REMOTE mode the overview page is shown on the display and it is updated continuously and it is not possible to control the unit manually.

The change from REMOTE to LOCAL has to be confirmed at the unit. Only after this confirmation (press "Go to local") the unit can be operated manually again.

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2.3 Blocking of components for one user

This unit is enable for the option "Group+Block". This option is designed for reserving and using selected components for individual users.

Attention: By ignoring the rules of handling the Group+Block function of MTS devices there is no guarantee of correct work.

For further information about Group+Block refer to MTS manual 26401.

2.4 Changing to Fastmode

The unit has implemented a special Fastmode. Remote commands will be processed faster at this mode.

By sending the Fastmode command (look at chapter 2.12.6) this mode can be activated or deactivated. At starting the unit, Fastmode is deactivated at any case.

The display will not be actualized and the remote interfaces will be deactivated with exception of the RS-232-interface connected to X3 and the sending interface.

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2.5 Manual operation

The manual operation is realized by a touchpanel.
The following screens can be selected and controlled by the touchpanel:

At the bottom of the display the following error message is shown, if one of the internal voltages is not detected correctly (dependent on power consumption of the components possibly this message is shown at shutdown).

Illustration 3: Display view AIAD-8x2/1-6G, “Error message“

At the bottom of the display the following warning is shown, if a voltage error has occurred at the past and now all voltages are detected correctly.

Illustration 4: Display view AIAD-8x2/1-6G, “Warning“

A warning (not an error) can be reset by remote control or at the tab-button "Setup" by pressing "Re Warn" (just visible at displayed warning).

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Tab-button "Atten": Screen for setting of variable attenuators

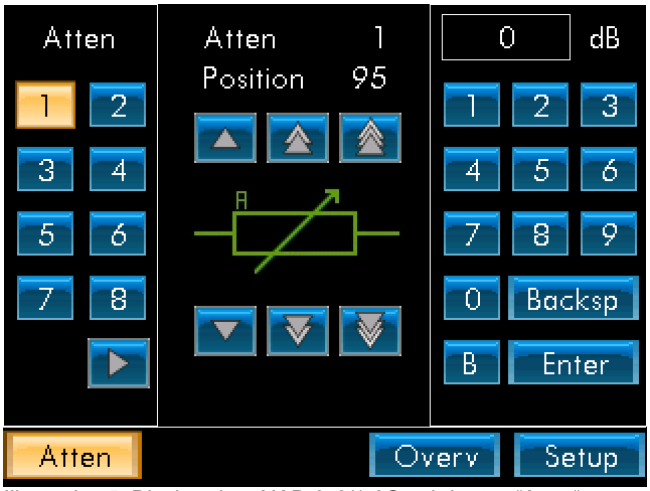

Illustration 5: Display view AIAD-8x2/1-6G, tab-button “Atten“

On the left the attenuator is selected. The active attenuator is shown by a button highlighted in yellow.

The position of the selected attenuator is shown in the middle area (Atten = selected attenuator, Position = attenuation in dB).

The attenuation can be set by UP/DOWN-keys (middle field) or by a keypad field (right hand side). By the keypad field on the right side of the display the dB-values of the attenuators can be typed in directly and are confirmed by pressing "Enter". The typed letters are shown above the keypad field. Wrong letters can be erased by pressing "Backsp".

The value of the selected attenuator can be influenced at three different stepwidths by UP/DOWN-keys as follows:

+1 dB -1 dB +5 dB -5 dB +10 dB -10 dB

Attention: These buttons just work like described when no components are blocked by other users!

By ignoring the rules of handling the Group+Block function of MTS devices there is no guarantee of correct work.
For further information about the left column and Group+Block refer to MTS manual 26401.

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Tab-button "Overv" – just attenuators: Screen with overview of selected attenuators

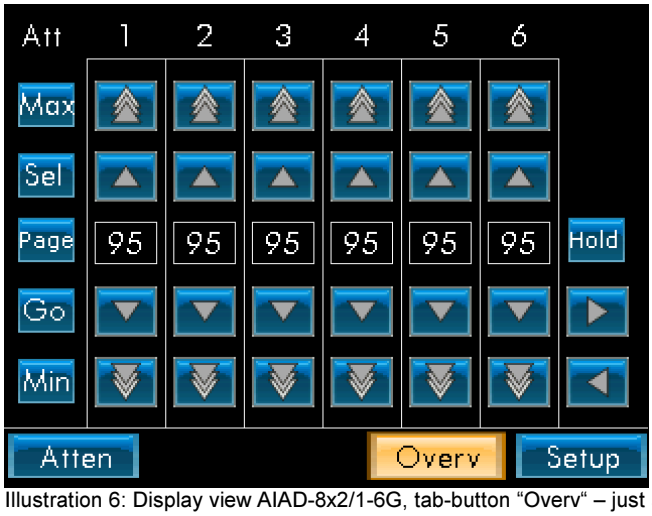

Illustration 6: Display view AIAD-8x2/1-6G, tab-button "Overv" – just attenuators

The value of the attenuators can also be influenced at these tab-button with two different stepwidths by UP/DOWN-keys as follows:

+1 dB -1 dB +10 dB -10 dB

By pressing "Overv" you can access the tab-button "Overv" – all components.
By pressing "Att" at the tab-button "Overv" – all components you can access the tab-button "Overv" – just attenuators.

Attention: These buttons just work like described when no buttons are selected at the left column!
These buttons just work like described when no components are blocked by other users!

By ignoring the rules of handling the Group+Block function of MTS devices there is no guarantee of correct work.
For further information about the left column and Group+Block refer to MTS manual 26401.

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Tab-button "Overv" – all components: Screen with overview of all existing components

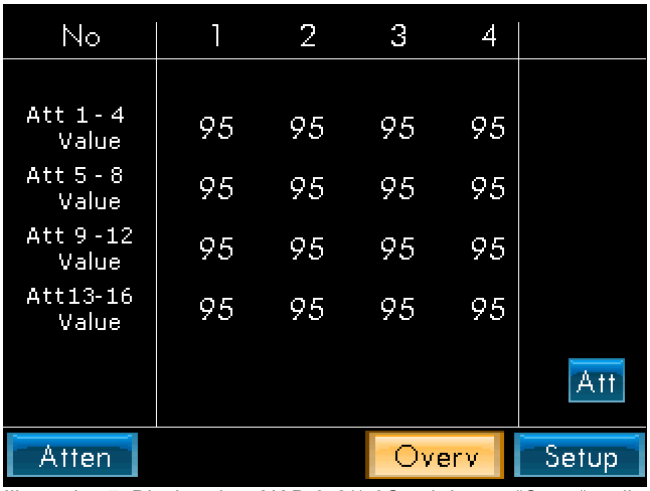

Illustration 7: Display view AIAD-8x2/1-6G, tab-button “Overv“ – all components

The tab-button "Overv" – all components shows an overview of all existing components. This tab-button is shown and updated automatically in the REMOTE mode.

By pressing "Att" you can access the tab-button "Overv" – just attenuators. At "Overv" – just attenuators you can access the tab-button "Overv" – all components by pressing "Overv".

Tab-button "Setup": Screen to execute primary adjustments

In the tab-button "Setup" information about the unit can be requested by the button "Show". Further it is possible to adjust the baud rate (look at chapter 2.8). A warning (not an error) can be reset by remote control or at the tab-button "Setup" by pressing "Re Warn" (just visible at displayed warning).

The IP-address which has been adjusted at booting the unit is shown at this case, too (if it was not read correctly from the LAN module an error message is shown).

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2.6 The RS-232-interface

The integrated RS-232-interface is laid out as a 9-pole SUB-D plug. The pins are connected according to RS-232-standard.

A zero modem cable (RX/TX crossed) is required for the connection. The recommended length of the interface cable is 15 m max..

2.7 Interface protocol RS-232

The transmission of data is carried out in ASCII format.
Start command and end command are hex signs.

Start command: STX = 0x02H (written as \02 or [0x02] usually)
End command: ETX = 0x03H (written as \03 or [0x03] usually)

Following parameters of the RS-232-interface are fix and can not be changed:

8 Databits
1 Startbit
1 Stopbit
No parity
No handshake

2.8 Configuration of the RS-232-interface

The adjustment of the baud rate for the RS-232-interface is done by the touchpanel in the tab-button "Setup". Changes are effected immediately by touching the corresponding button without an additional affirmation. The selected baud rate is yellow. The user can select between the following three baud rates.

Basic setting is 115200 baud.

Illustration 8: Setting of baud rate

Additionally the baud rate can be set by remote control. At this case the display changes into remote mode.

Receive string: "ST-BA***y***"

y is the switched baud rate (9600, 57600 or 115200 in ASCII format).

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2.9 The Ethernet-interface

The LAN-interface is laid out as an 8-pole RJ45-female-plug.

2.10 Interface protocol Ethernet

The transmission of data is carried out in ASCII format.
Start command and end command are hex signs.

Start command: STX = 0x02H (written as \02 or [0x02] usually)
End command: ETX = 0x03H (written as \03 or [0x03] usually)

The Ethernet-interface is internally connected by RS-232. Following internal parameters are fix and can not be changed:

115200 Baud
8 Databits
1 Startbit
1 Stopbit
No parity
No handshake

2.11 Configuration of the Ethernet-interface

Interface set-up (IP-address, port) can be done by using a webbrowser (e. g. internet explorer) via putting in the IP-address.

Basic setting is TCP-protocol, IP-address "192.168.83.50" and port 4001.

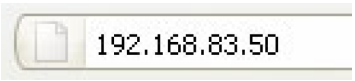

Illustration 9: Insertion of IP-address at browser-window

Attention: The areas of the IP-address must not begin with leading zeros (wrong: 192.168.083.050, right: 192.168.83.50)!

If you can not find your IP-address anymore, look at the tab-button "Setup" or use the DeviceInstaller from Lantronix and search it (search button). By opening the folders the current IP-address will be shown (self-explanatory).

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Calling the IP-address through a browser:

After calling the IP-address you can acknowledge the keyword-window without any entries (OK). The configuration window opens automatically as follows.

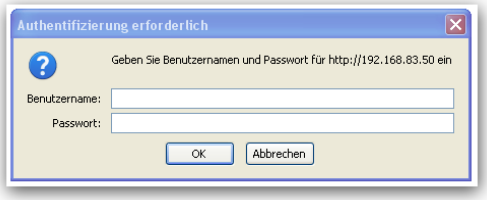

Illustration 10: Keyword-window of the LAN-module

Adjusting the IP-address through a browser:

You can adjust the IP-address in the following window. Alternatively, you can select "Obtain IP address automatically" to work with DHCP-mode.

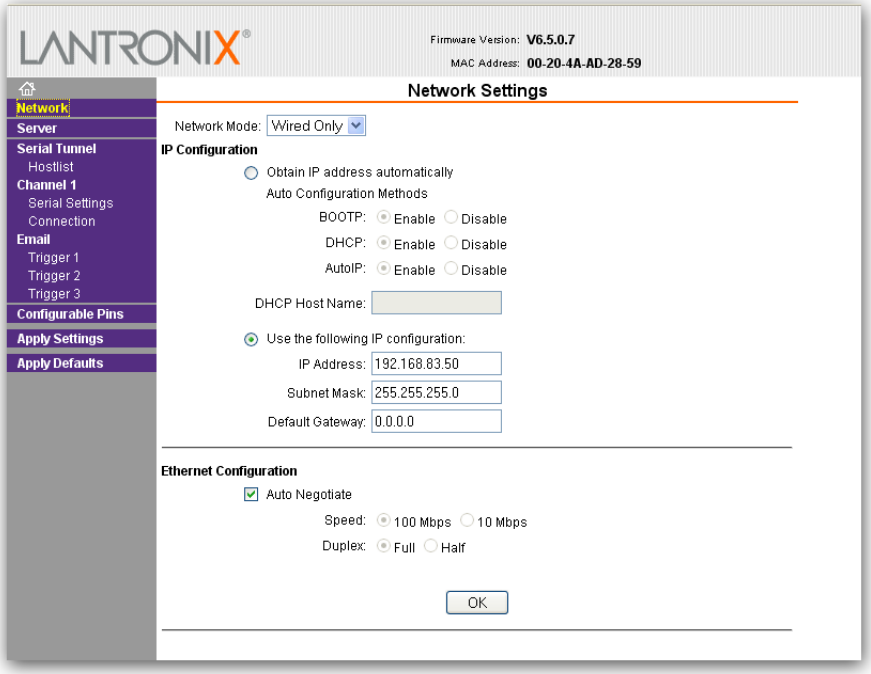

Illustration 11: Adjustment of IP-address of the LAN-module

Attention: After changes you have to press OK
and then you have to execute Apply Settings!

Executing further operations:

To do extended operations use the document Extended_Configuration_XPORT_Module on the CD of the unit.

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2.12 Control commands of the unit

All REMOTE-interfaces have equal rights. Its commands are executed in the same order as received.

2.12.1 Set command

Receive string: "A***x***P***y***"

e. g. receive string: "A1P1A2P1"

"A***x***P***y***": ***x*** is the number of the variable attenuator
(1 – 16 in ASCII format).
y is the switched position of the variable attenuator
(0 – 95 in ASCII format).

It is possible to control several attenuators with one receive string.

Attention: Components blocked by other users are not set by this command.

For further information about Group+Block refer to MTS manual 26401.

2.12.2 Increment and decrement command

Receive string: "A***x***+", "A***x***-", "A***x***+***y***" or "A***x***-***y***"

e. g. receive string: "A1+10A2-15"

"A***x***+(***y***)": ***x*** is the number of the variable attenuator
(1 – 16 in ASCII format).
y is the value to be add to the position of the variable attenuator,
nothing for ***y*** means the minimum value (>0) will be add
(1 – 95 in ASCII format, resulting values >95 are set to 95, no break).
"A***x***-(***y***)": ***x*** is the number of the variable attenuator
(1 – 16 in ASCII format).
y is the value to be subtract from the position of the variable attenuator,
nothing for ***y*** means the minimum value (>0) will be subtracted
(1 – 95 in ASCII format, resulting values <0 are set to 0, no break).

It is possible to control several attenuators with one receive string.

Attention: Components blocked by other users are not set by this commands.

For further information about Group+Block refer to MTS manual 26401.

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2.12.3 Clear command

Receive string: "C"

With the clear command all variable attenuators are set to 95 dB.

Attention: Components blocked by other users are not cleared by this command.

For further information about Group+Block refer to MTS manual 26401.

2.12.4 Status check

After one of the following commands was received, the unit sends a strings with the state of its components.

Receive string: "ST", "ST1" or "ST2"

Send string: "A1Py_1A2Py_2 … A16Py_{16}ERR***v*MOD**" (ERR***v*** only at "ST1" or "ST2")

y is the switched position of the variable attenuator (0 – 95 in ASCII format).

v is the error state of the unit, which is just displayed at receive string "ST1" or "ST2" (value is 0 – 2 in ASCII format, 0 means no error has occurred, 1 means voltage error is active (1 possibly occurs at shutdown of the unit but not assured), 2 means voltage warning after voltage error has disappeared, 2 can not be displayed at "ST2" because it is reset by "ST2" before answering, resetting 2 by "ST2" sets the unit to remote mode, 2 is reset by resetting the unit and can be reset by manual control, too).

MOD is the working mode of the unit (LOC means LOCAL, REM means REMOTE).

This string begins with the start command and ends with the end command.

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After one of the following commands was received, the unit sends the corresponding string with the state of the according interface.

Receive string: "ST-BA"

Send string: "ST-BA***y***"

y is the baud rate in ASCII format (9600, 57600, 115200).

This string begins with the start command and ends with the end command.

Receive string: "ST-IP"

Send string: "ST-IP***y***"

y is the IP-address in ASCII format (e. g. 192.168.83.50), which was read at the last booting of the unit. If the LAN-module has not offered the address the unit answers "ST-IP Reading Error" at this request.

This string begins with the start command and ends with the end command.

2.12.5 Ident command

Receive string: "*IDN?"

After sending the ident command the device answers with the device-identifier.

The device-identifier begins with the start command and ends with the end command.

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2.12.6 Fastmode command

Receive string: "MTS-FM***x***"

x is the state of the fastmode
(values 0 – 1 in ASCII format,
0 means deactivation of fastmode operation and
1 means activation of fastmode operation).

By sending the fastmode command this mode can be activated or deactivated.
At starting the unit fastmode is deactivated at any case.

The display will not be actualized and the remote interfaces will be deactivated with exception of the RS-232-interface connected to X3 and the sending interface.

Remote commands will be processed faster at this mode.

The display shows the active interface, which caused fastmode operation.

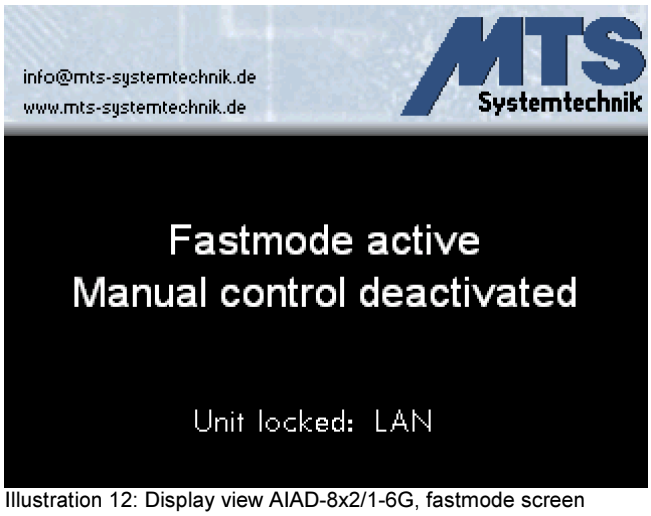

Illustration 12: Display view AIAD-8x2/1-6G, fastmode screen

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2.13 Characteristics of the remote controlling at occurring errors of commands

Attention: It is absolutely recommended to set not more than eight components by one command (without STX and ETX between the Strings). The whole string has to be defined by STX at the start and ETX at the end.

One command is executed when the first sign of the next component or the end command is received correctly.

Once the unit detects a wrong syntax of a command, it breaks interpreting commands and starts again at the next detected start command.

At set commands beside the syntax, the numbering is checked, too. If components are set, which do not exist, the unit breaks the command and starts the analysis again at a detected start command. If not existing positions of the selected component are set, the unit breaks the command and starts the analysis again at a detected start command.

Attention: For increment and decrement commands respective the position only the sent value is checked, but not the result of the calculation. Allowed values to be sent are 1 to 95 or no sign at any case. Results are internally limited from 0 up to 95 without causing a break.

STX and ETX are shown in following cases, too:

STX is written as \02 or [0x02] usually,
ETX is written as \03 or [0x03] usually.

Correct string: "[0x02]A1P2A2P1A3+A4-10A5P0[0x03]"
Reaction: Five attenuators are set.

Incorrect string: "[0x02]A1P2A2P***100***A3P0[0x03]" "[0x02]A4P1[0x03]"
Reaction: Attenuator 1 is set, attenuator 2 and 3 are not set, because position 100 does not exist.
Attenuator 4 is set, because a new command has been started.

Incorrect string: "[0x02]A1P2A***40***P1A3P0[0x03]" "[0x02]A4P1[0x03]"
Reaction: Attenuator 1 is set, attenuator 40 and 3 are not set, because attenuator 40 does not exist.
Attenuator 4 is set, because a new command has been started.

Incorrect string: "[0x02]A1P2***Z***1P1A3P0[0x03]" "[0x02]A4P1[0x03]"
Reaction: Attenuator 1 is not set, because Z1P1 is an unknown component.
Attenuator 3 is not set, because command was broken before.
Attenuator 4 is set, because a new command has been started.

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3 SERVICE

3.1 Changing fuse of 230 V AC supply

Inside of the appliance plug there are the fuses F1 and F2. Defective fuses have to be changed by fuses of the same type. Pull out the fuse holder at zero-current-unit (power cable removed) to get access to the fuses.

Attention: To change fuses, first switch off power at power switch S1 **a n d** remove the power cable!

Defective fuses have to be replaced by new fuses of the following type!
F1, F2 = T3.15/250 (3.15 A, 250 V AC, slow blow)

3.2 Cleaning

Maintenance work essentially only includes the cleaning of the unit.
Inform competent authorized personnel if damages are determined.

Attention: To clean the unit, first switch off power at power switch S1
a n d remove the power cable!
Depending on the degree of contamination, the unit has to be cleaned with a lint-free, soft and dry cloth or brush. Do not use cleaning liquids except for mild detergents (moisten cloth) for cleaning!

3.3 Maintenance and repair

No regular maintenance check for the unit is required.
Checking the unit is done by calibration.

During the warranty period only the manufacturer is authorized to repair the unit.

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4 TECHNICAL DATA

Technical data are shown on the specification sheet in the appendix.

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5 WARRANTY

The "General Terms and Conditions for Delivery and Payment of MTS Systemtechnik GmbH" or agreed warranty terms are applicable.

There will be no warranty for damages caused by improper handling, improper operation, technical changes, maintenance or physical damages, if these damages were not caused by MTS Systemtechnik GmbH.

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6 APPENDIX

Is the manual delivered as CD, you can find the separate files of appendix as pdf on the CD.

Annex 1 Specification for the Air Interface Adapter AIAD-8x2/1-6G

Annex 2 Block diagram for the Air Interface Adapter AIAD-8x2/1-6G

Annex 3 EC-Declaration of conformity for the Air Interface Adapter AIAD-8x2/1-6G

Annex 4 Extended_Configuration_XPORT_Module

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