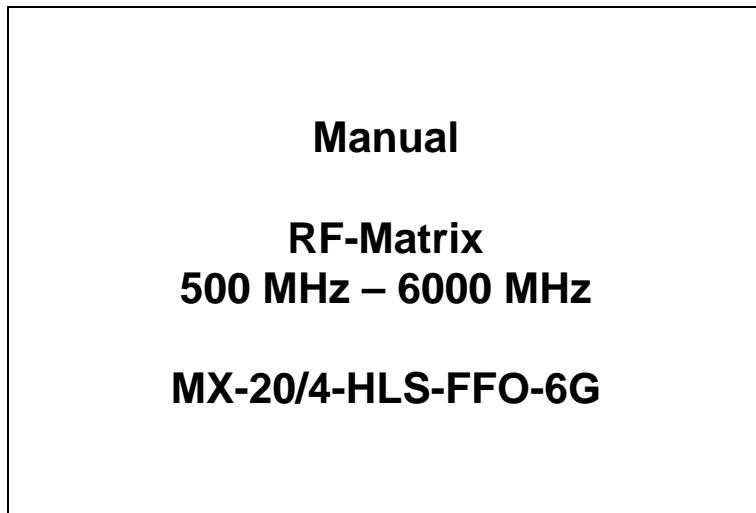
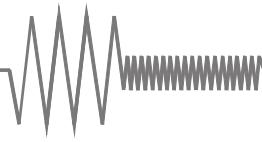


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Manual

RF-Matrix MX-20/4-HLS-FFO-6G 500 MHz – 6000 MHz

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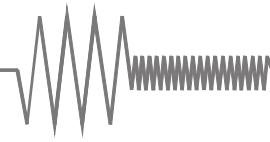
Checked: G. Jaumann

G. Jaumann

Released: M. Demharter

M. Demharter

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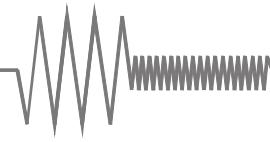


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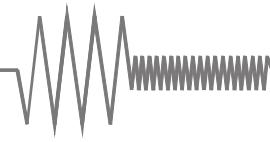
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Alteration Chart

Release no.	Version	Unit state	Description of changes	Date	Editor
1	1.0	00	first edition	10 December 2018	M. Demharter
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					



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1 GENERAL

1.1 General description

This manual describes the RF-Matrix named "MX-20/4-HLS-FFO-6G" unit state 00 and higher.

The RF-Matrix consists of dividers at the inputs and semiconductor switches at the outputs, a power supply and a control card.

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

1.2 Delivered parts

- RF-Matrix
- Power cable
- Operating manual on CD

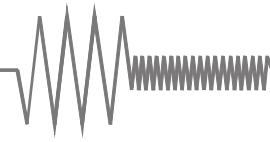
1.3 Safety precautions

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 personal 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 inputs
- 2 Power switch S1 for 230V AC-supply with integrated control lamp

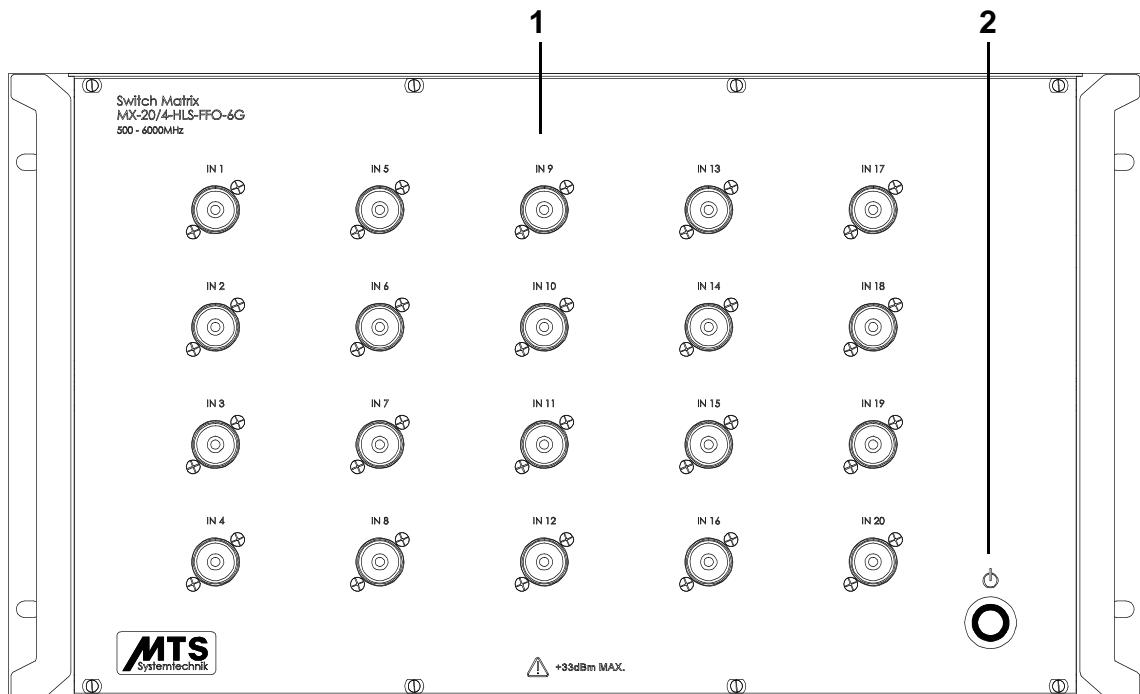
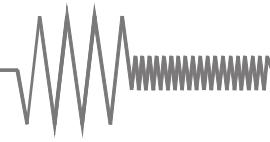


Illustration 1: Front view MX-20/4-HLS-FFO-6G



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1.5 Components of the rear panel

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

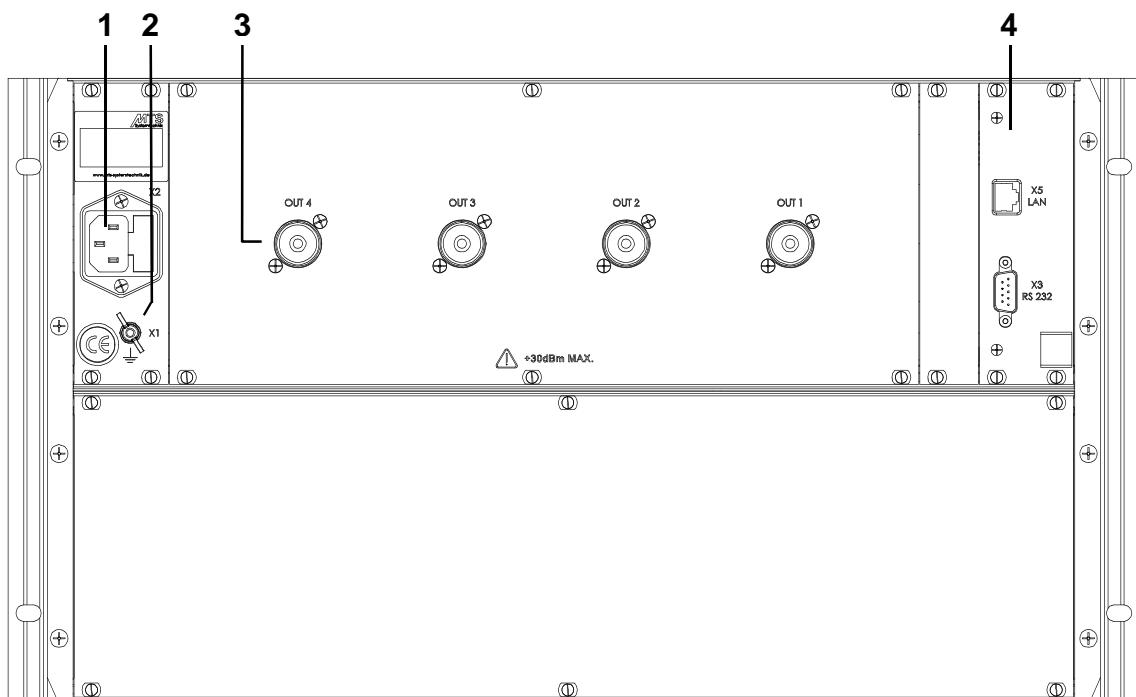
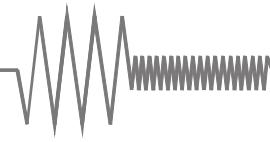


Illustration 2: Rear view MX-20/4-HLS-FFO-6G



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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

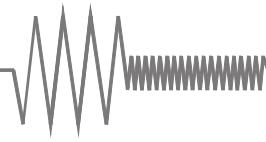
Cables and RF-connectors 4.3-10 male with an impedance of 50 Ω are required. Cables can be connected without RF-power during the operation.

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

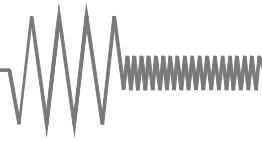
You can do a reset of the unit by switching off the power switch S1 at the front panel. After waiting at least 30 seconds and turning on the unit it will boot again and then it will work normally.

The control card detects voltage errors of the power supplies. At detection of a voltage error or loss of power (e. g. switching off) the unit saves the adjusted values (e. g. positions of components). 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 present at shutdown.

On starting the unit or returning of power (if the power switch is on) all semiconductor switches will switch to its base position (no path connected).

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.



2 CONTROLLING OF THE UNIT

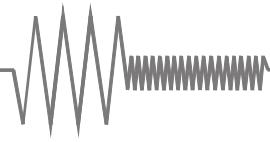
After switching power on, the device automatically starts the operating mode. Now it is possible to control the unit by the RS-232-interface or the Ethernet-interface.

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.



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2.3 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..

2.4 Interface protocol RS-232

The transmission of data is carried out in ASCII format.

Start command: STX = 0x02H

End command: ETX = 0x03H

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

8 Databits

1 Startbit

1 Stopbit

No parity

No handshake

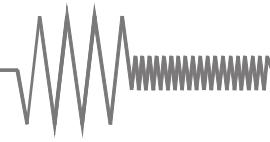
2.5 Configuration of the RS-232-interface

The user can select between three baud rates. Basic setting is 115200 baud.

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

Receive string: "ST-BAy"

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



2.6 The Ethernet-interface

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

2.7 Interface protocol Ethernet

The transmission of data is carried out in ASCII format.

Start command: STX = 0x02H

End command: ETX = 0x03H

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

2.8 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.

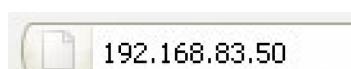


Illustration 3: Insertion of IP-address at browser-window

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).

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 4: 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.

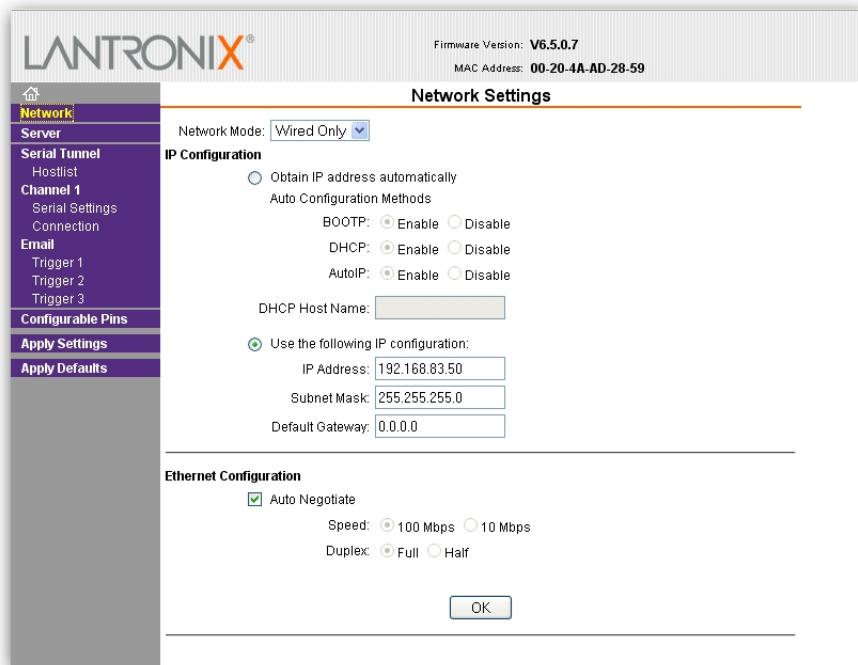
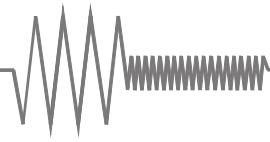


Illustration 5: Adjustment of IP-address of the LAN-module

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.



2.9 Control commands of the unit

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

2.9.1 Set command

Receive string: "RxPy"

e. g. receive string: "R1P1R2P1"

"RxPy": **x** is the number of the output
(1 – 4 in ASCII format).
y is the number of the input
(0 – 20 in ASCII format).

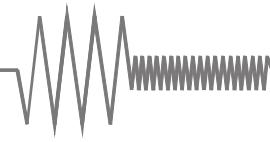
It is possible to control several outputs with one receive string.

It is possible to use one input for more than one output (worst case for all outputs).

2.9.2 Clear command

Receive string: "C"

With the clear command all outputs are switched to position 0 (off).



2.9.3 Status check

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

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

Send string: "R1Py₁R2Py₂ ... R4Py₄ERRvMOD" (ERRv only at "ST1" or "ST2")

y is the switched input of the RF-Matrix
(0 – 20 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, 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.

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-BAy"

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

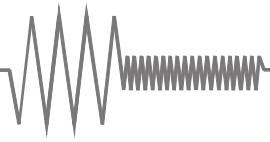
This string begins with the start command and ends with the end command.

Receive string: "ST-IP"

Send string: "ST-IPy"

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.



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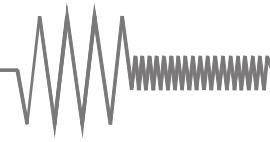
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2.9.4 Ident command

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.



2.10 Characteristics of the remote controlling at occurring errors of commands

Attention: It is absolutely recommended to send not more than eight Receive Strings 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. Are components to be set, which do not exist, the unit breaks the command and starts the analysis again at a detected start command. Are not existing positions of the selected component to be set, the unit breaks the command and starts the analysis again at a detected start command.

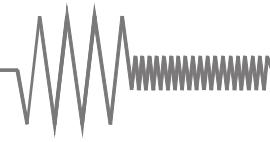
Following examples are valid for all kinds of components.
STX and ETX are shown in following cases, too:

Correct string: "[02H]R1P2R2P1R3P0[03H]"
Reaction: Three paths are set.

Incorrect string: "[02H]R1P2R2P30R3P0[03H]" "[02H]R4P1[03H]"
Reaction: Output 1 is set, output 2 and 3 are not set because input 30 does not exist. Output 4 is set, because a new command has been started.

Incorrect string: "[02H]R1P2R30P1R3P0[03H]" "[02H]R4P1[03H]"
Reaction: Output 1 is set, output 30 and 3 are not set because output 30 does not exist. Output 4 is set, because a new command has been started.

Incorrect string: "[02H]R1P2Z2P1R3P0[03H]" "[02H]R4P1[03H]"
Reaction: Output 1 is not set, because an unknown identifier is detected before the command is finished by ETX or the start of the next command. Z2P1 is an unknown component and output 3 is not set. Output 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.

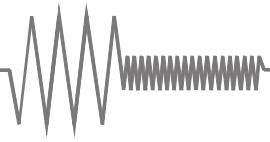
Attention: To clean the unit, first switch off power at power switch S1 **a n d** remove the power cable!

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.

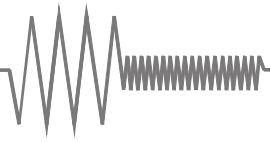


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4 TECHNICAL DATA

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



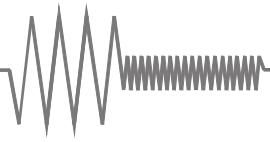
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5 WARRANTY

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

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

Annex 1 Specification for the RF-Matrix MX-20/4-HLS-FFO-6G

Annex 2 EC-Declaration of conformity for the RF-Matrix MX-20/4-HLS-FFO-6G

Annex 3 Block diagram for the RF-Matrix MX-20/4-HLS-FFO-6G

Annex 4 Extended_Configuration_XPORT_Modul