

Programming Guide

FDMX-PT



Applicable for firmware version 1.xx

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1 Introduction

The FDMX-PT is a Frequency Demultiplexer used to separate different bands from a frequency division multiplex. The system offers output channels for the following broadcast signals:

- SAT (SDARS)
- GNSS (GPS, GLONASS, GALILEO)
- DAB (Band III +L)
- DVB-T
- AM/FM (incl. IBOC)

There are two separate channels available for AM/FM signals, summarized the device consists of six independent channels.

The FDMX-PT provides special functions for phantom voltage testing. An integrated DC voltmeter can be used to measure the phantom voltages of connected devices and it is possible to adjust the DC loads of the channels. Additionally, the device supports configuration of thresholds to indicate the existence of phantom voltages at the different channels. Load settings and signaling thresholds can be stored permanently to use the device without a PC.

The device can be controlled via an USB interface using simple ASCII commands, which are oriented towards SCPI99 (Standard Commands for Programmable Instruments).

The device firmware includes a build-in selftest function to detect error conditions.

2 Control via USB Interface

The USB remote interface allows transmitting ASCII commands to the device and receiving associated responses.

The device sends data only in conjunction with received commands.

All system outputs are terminated with the combination of the characters '#' (ASCII 0x23) and Carriage Return (ASCII 0x0D). Furthermore, the Carriage Return character is used for word wraps within a single output.

The decimal point is used for decimal separation.

2.1 Installation

To control the FDMX-PT via the USB interface, it has to be installed as a virtual COM port (VCP) on your PC. After connecting the device, the operating system tries to install the correct device driver automatically. If this does not work, please download the driver from <http://www.ftdichip.com/Drivers/VCP.htm> and install it manually. You will also find the driver on the included CD-ROM.

On windows operating systems the device appears as 'USB Serial Port (COMx)' in the device manager after a successful installation.

2.2 Establishing a Connection

After successful installation of the USB interface, it should be possible to start a connection via standard terminal software. The free terminal client 'PuTTY' is recommended.

Please use the following settings to start a connection:

- Connection Type: Serial
- Serial line / COM Port: COMx (the port number x is assigned from the operating system)
- Speed / Baud Rate: 9600 baud

After establishing the connection, the command 'idn?' can be used to test the communication. The system should reply with device information.

Note: If it is possible to start a connection but you cannot see the characters typed in, please make sure that a local echo is configured in your terminal software. If local echo is not supported, it is possible to enable an echo function in the device firmware.

2.3 Command Syntax

The ASCII commands are oriented towards SCPI99 (Standard Commands for Programmable Instruments).

An abbreviated and a complete form can be used for most of the commands. In the command descriptions, the abbreviated form is shown in capital letters.

The commands are organized in a tree structure with different command subsystems. When using a command, the subsystem names and the command have to be transferred, separated by colons. Like the commands, the subsystem names can be used in an abbreviated and a complete form.

Example for command 'CONFigure:LOAD:DEFault':

- Complete form: configure:load:default
- Abbreviated form: conf:load:def

A space character (ASCII 0x20) is used for separation of a command and its parameter list.

Parameters in the parameter list are separated with comma characters (ASCII 0x2C).

The decimal point (ASCII 0x2E) has to be used for decimal separation.

String parameters, excepted key words, have to be enclosed in double quotes (ASCII 0x22).

The interface is not case sensitive.

In the command descriptions, optional parts or optional parameters are shown in squared brackets.

2.4 Command Set

2.4.1 System Identification

Short Description:
Request device information
Full Description
Prints device information with software revision <SR>, hardware revision <HR>, serial <SN> and label <LABEL>.
Command:
*IDN?
Parameters:
-
Response:
IDN NA: FDMX-PT ID: 1310.6003.2 SR: <SR> HR: <HR> SN: <SN> LABEL: <LABEL> #
Additional Information:
- The asterisk (*) is optional.

2.4.2 Help Function

Short Description:
Get help output
Full Description
Prints a summary <SUMMARY> of the command set.
Command:
SYSTem:HELP? SYSTem:HEADers?
Parameters:
-
Response:
HELP <SUMMARY> #
Additional Information:

2.4.3 System Capability Information

Short Description:
Request the device capability
Full Description
Prints the device capability <CAPABILITY>.
Command:
SYSTem:CAPability?
Parameters:
-
Response:
CAPABILITY <CAPABILITY> #
Additional Information:
-

2.4.4 Self-Test Functionality

Short Description:
Request selftest result
Full Description
Prints the selftest result <RESULT>. The result '0' describes the regular state, '1' the error state.
Command:
*TST?
Parameters:
-
Response:
TST <RESULT> #
Additional Information:
- The asterisk (*) is optional.

2.4.5 Rebooting the Device

Short Description:
Perform a reboot
Full Description
Reboots the device after <SECONDS> seconds. If the optional parameter <SECONDS> is not used, the device reboots immediately.
Command:
SYSTem:REBoot <SECONDS>
Parameters:
<SECONDS> = 0 ... 20 (1)
Response:
When using without parameter <SECONDS>: BOOT #
When using with parameter <SECONDS>, e.g. 3: BOOT 3 BOOT 2 BOOT 1 BOOT #
Additional Information:
-

2.4.6 Factory Reset

Short Description:
Perform a factory reset
Full Description
Performs a factory reset and reboots the device.
Command:
*RST SYSTem:PREset
Parameters:
-
Response:
PRESET BOOT #
Additional Information:
-

2.4.7 System State

Short Description:
Request the device state
Full Description
Prints the device state <STATE>. It can be 'NORMAL' for the regular state, 'VOLT_EXCEEDANCE' for the voltage exceedance state, 'PWR_EXCEEDANCE' for the power exceedance state and 'TEMP_EXCEEDANCE' for the temperature exceedance state.
Command:
SYSTem:STATe?
Parameters:
-
Response:
STATE <STATE> #
Additional Information:
- The device state can be changed by the built-in selftest function.

Short Description:
Reset the device state
Full Description
Sets the device state to 'NORMAL'.
Command:
SYSTem:STATe:CLear
Parameters:
-
Response:
STATE NORMAL #
Additional Information:
- The device state can be changed by the built-in selftest function.

2.4.8 Load Configuration

Short Description:
Set the DC load for a single channel
Full Description
Sets a DC load of <LOAD> mA for the channel <CH>
Command:
CONFigure:LOAD <CH>, <LOAD>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2 <LOAD>: 0...300 mA
Response:
LOAD <CH> <LOAD>mA #
Additional Information:
-

Short Description:
Query the DC load for a single channel
Full Description
Query the DC load setting for the channel <CH>
Command:
CONFigure:LOAD? <CH>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2
Response:
LOAD <CH> <LOAD>mA #
Additional Information:
-

Short Description:
Query the DC load for a all channels
Full Description
Query the DC load setting for all channels with a single query
Command:
CONFigure:LOAD?
Parameters:
-
Response:
LOAD SAT <LOAD>mA GNSS <LOAD>mA DAB <LOAD>mA DVBT <LOAD>mA AFM1 <LOAD>mA AFM2 <LOAD>mA #
Additional Information:
-

Short Description:
Clear all load settings
Full Description
Sets all channel loads to 0mA
Command:
CONFigure:LOAD:CLEar
Parameters:
-
Response:
LOAD SAT 0mA GNSS 0mA DAB 0mA DVBT 0mA AFM1 0mA AFM2 0mA #
Additional Information:
-

Short Description:
Sets a single channel to its default load value
Full Description
Sets channel <CH> to the default value <DEFAULTLOAD> in mA
Command:
CONFigure:LOAD:RESet <CH>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2
Response:
LOAD <CH> <DEFAULTLOAD>mA #
Additional Information:
-

Short Description:
Sets a all channels to their default load values
Full Description
Sets all channels to the individual default value <DEFAULTLOAD> in mA
Command:
CONFigure:LOAD:RESet
Parameters:
-
Response:
LOAD SAT <DEFAULTLOAD>mA GNSS <DEFAULTLOAD>mA DAB <DEFAULTLOAD>mA DVBT <DEFAULTLOAD>mA AFM1 <DEFAULTLOAD>mA AFM2 <DEFAULTLOAD>mA #
Additional Information:
-

Short Description:
Sets a single channel's default load value and applies it
Full Description
Sets the default value of channel <CH> to <DEFAULTLOAD> mA and applies the setting
Command:
CONFigure:LOAD:DEFault <CH>,<LOAD>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2 <DEFAULTLOAD>: 0...300 mA
Response:
DEFAULTLOAD <CH> <DEFAULTLOAD>mA #
Additional Information:
-

Short Description:
Query a single channel's default load value
Full Description
Queries the default load <DEFAULTLOAD> for channel <CH>
Command:
CONFigure:LOAD:DEFault? <CH>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2
Response:
DEFAULTLOAD <CH> <DEFAULTLOAD>mA #
Additional Information:
-

Short Description:
Query the default load values for all channels
Full Description
Queries the default load <DEFAULTLOAD> for all channels
Command:
CONFigure:LOAD:DEFault?<
Parameters:
-
Response:
DEFAULTLOAD SAT <DEFAULTLOAD>mA GNSS <DEFAULTLOAD>mA DAB <DEFAULTLOAD>mA DVBT <DEFAULTLOAD>mA AFM1 <DEFAULTLOAD>mA AFM2 <DEFAULTLOAD>mA #
Additional Information:
-

2.4.9 Voltage Measurement

Short Description:
Measure the voltage for a single channel
Full Description
Measure the DC voltage of channel <CH> in mV.
Command:
MEASure:VOLTage? <CH>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2
Response:
VOLT <CH> <VOLT>mV #
Additional Information:
-

Short Description:
Measure the voltage for all channels
Full Description
Measure the DC voltage for all channels in mV.
Command:
MEASure:VOLTage?
Parameters:
Response:
VOLT SAT <VOLT>mV GNSS <VOLT>mV DAB <VOLT>mV DVBT <VOLT>mV AFM1 <VOLT>mV AFM2 <VOLT>mV #
Additional Information:
-

2.4.10 Power Measurement

Short Description:
Measure the power consumption / dissipation for a single channel
Full Description
Measure the power consumption / dissipation of channel <CH> in mW.
Command:
MEASure:POWer? <CH>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2
Response:
POWER <CH> <POWER>mW #
Additional Information:
-

Short Description:
Measure the power consumption / dissipation for all channels.
Full Description
Measure the power consumption / dissipation for all channels with a single query.
Command:
MEASure:POWer?
Parameters:
-
Response:
POWER SAT <POWER>mW GNSS <POWER>mW DAB <POWER>mW DVBT <POWER>mW AFM1 <POWER>mW AFM2 <POWER>mW #
Additional Information:
-

2.4.11 Temperature Measurement

Short Description:
Request operating temperature
Full Description
Prints the operating temperature <TEMP>.
Command:
MEASure:TEMPerature?
Parameters:
-
Response:
TEMP <TEMP> degC #
Additional Information:
-

2.4.12 Complete Measurement

Short Description:
Query the DC load, the DC voltage and the power for all channels
Full Description
Query the DC load <LOAD> in mA, the DC voltage <VOLT> in mV and the power <POWER> in mW. Additionally, the summarized power <POWER-SUM> for all channels and the temperature <TEMP> in °C will be returned.
Command:
MEASure:SUMMary?
Parameters:
-
Response:
SUMMARY SAT <LOAD>mA <VOLT>mV <POWER>mW GNSS <LOAD>mA <VOLT>mV <POWER>mW DAB <LOAD>mA <VOLT>mV <POWER>mW DVBT <LOAD>mA <VOLT>mV <POWER>mW AFM1 <LOAD>mA <VOLT>mV <POWER>mW AFM2 <LOAD>mA <VOLT>mV <POWER>mW POWER-SUM: <POWER-SUM>mW TEMP: <TEMP> degC #
Additional Information:
-

2.4.13 Optical Signalization

Short Description:
Configure optical signalization threshold for a single channel
Full Description
Configure optical signalization threshold <TRSH> for channel <CH> in mV
Command:
CONFigure:STHreshold <CH>,<TRSH>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2 <TRSH>: 1000...15000
Response:
STHRESHOLD <CH> <TRSH>mV #
Additional Information:
-

Short Description:
Query optical signalization threshold for a single channel.
Full Description
Query the optical signalization threshold value<TRSH> for channel <CH> in mV.
Command:
CONFigure:STHreshold? <CH>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2
Response:
STHRESHOLD <CH> <TRSH>mV #
Additional Information:
-

Short Description:
Query optical signalization threshold for all channels.
Full Description
Query the optical signalization threshold value<TRSH> for all channels in mV.
Command:
CONFigure:STHreshold?
Parameters:
-
Response:
STHRESHOLD SAT <TRSH>mV GNSS <TRSH>mV DAB <TRSH>mV DVBT <TRSH>mV AFM1 <TRSH>mV AFM2 <TRSH>mV #
Additional Information:
-

Short Description:
Reset the optical signalization threshold value for a single channel to the default value.
Full Description
Rest the optical signalization threshold value for channel <CH> to it's default value <DEFAULTTHRSH>.
Command:
CONFigure:STHreshold:RESet <CH>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2
Response:
STHRESHOLD <CH> <DEFAULTTHRSH>mV #
Additional Information:
-

Short Description:
Reset the optical signalization threshold value for all channels to their default values.
Full Description
Reset the optical signalization threshold value for all channels to their default values <DEFAULTTHRSH>.
Command:
CONFigure:STHreshold:RESet
Parameters:
-
Response:
STHRESHOLD SAT <DEFAULTTTRSH>mV GNSS <DEFAULTTTRSH>mV DAB <DEFAULTTTRSH>mV DVBT <DEFAULTTTRSH>mV AFM1 <DEFAULTTTRSH>mV AFM2 <DEFAULTTTRSH>mV #
Additional Information:
-

Short Description:
Configure the default value for the optical signalization threshold
Full Description
Set the optical signalization threshold default value for channel <CH> and apply it.
Command:
CONFigure:STHreshold:DEFault <CH>,<DEFAULTTTRSH>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2 <DEFAULTTTRSH>: 1000...15000
Response:
DEFAULTSTHRESHOLD <CH> <DEFAULTTTRSH>mV #
Additional Information:
-

Short Description:
Query the default value for the optical signalization threshold of a single channel
Full Description
Query the default value for the optical signalization threshold of a channel <CH>
Command:
CONFigure:STHreshold:DEFault? <CH>
Parameters:
<CH>: SAT, GNSS, DAB, DVBT, AFM1, AFM2
Response:
DEFAULTSTHRESHOLD <CH> <DEFAULTTTRSH>mV #
Additional Information:
-

Short Description:
Query the default value for the optical signalization threshold of all channels.
Full Description
Query the default value for the optical signalization threshold of all channels with a single query.
Command:
CONFigure:STHReshold:DEfault?
Parameters:
-
Response:
<pre> DEFAULTSTHRESHOLD SAT <DEFAULTTTRSH>mV GNSS <DEFAULTTTRSH>mV DAB <DEFAULTTTRSH>mV DVBT <DEFAULTTTRSH>mV AFM1 <DEFAULTTTRSH>mV AFM2 <DEFAULTTTRSH>mV # </pre>
Additional Information:
-

3 Contacts

3.1 Technical Support

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If you have any technical questions regarding this or other products of Becker Nachrichtentechnik, please contact us via phone, fax or email.

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