

DATA SHEET

MFE X (Code 6481)
 Digital Front End for
 DECT/NG-DECT/CAT-iq™



Front view MFE X

DESCRIPTION

MFE X serves as “Reference Portable Part” (RefPP) and as “Reference Fixed Part” (RefFP) for acoustic measurements of cordless terminals (DECT/NG-DECT/CAT-iq™). As required by the CAT-iq™ standard specified by the DECT Forum, it supports modern wideband and IP connections as well as the classic DECT telephony.

MFE X is used in conjunction with the following system components:

- HMS II.3 (artificial head measurement system) with HHP III (handset positioning mechanism),
- MFE VI.1 (analog measurement front end with integrated mouth amplifier),
- MFE VIII.1 (IP reference gateway)
- MFE IX (IP network impairment simulator with WLAN/WiFi access point).

Connected via USB (Plug & Play) with a PC or notebook, MFE X is configured and controlled by ACQUA*.

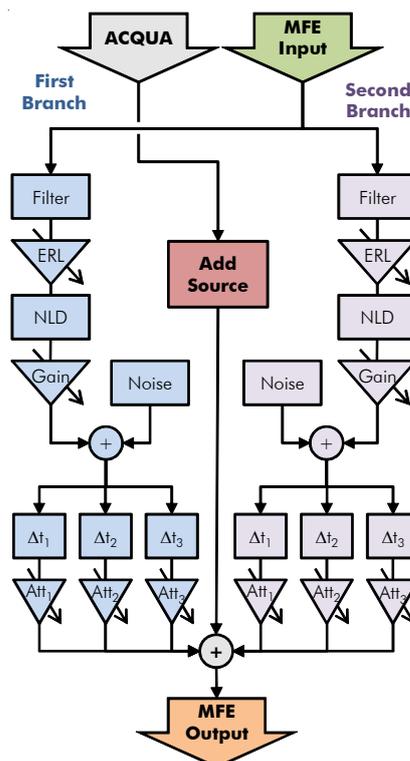
By means of MFE X and the other components mentioned above, ACQUA conducts automated measurements according to international, HEAD acoustics or user-defined standards. MFE X thus serves for development and optimization as well as quality control and benchmark testing in all areas where excellent voice quality of cordless telephony devices plays a decisive role.

DIGITAL ECHO PATH

Due to the integrated digital echo path the frontend MFE VI.1 is particularly suited for real-time measurement of echo cancellers.

The block diagram shows the function of the digital echo path which may consist of up to two branches:

- In addition to the assignment of the in- and output of the echo path, a source signal can be added.
- Eight different filters according to ITU-T Recommendation G.168 can be selected, each with two amplitude factors, i.e. 16 filters in total. An Echo Return Loss (ERL) value is automatically assigned to each filter which can be modified by the user. The default ERL values are also derived from ITU-T G.168. Moreover, a user-defined filter can be used (for sampling rates of 8, 16, 48 kHz).



Echo path block diagram

OVERVIEW

MFE X is a light-weight and compact front end for acoustic measurements of DECT/NG-DECT/CAT-iq™ terminals, e.g. according to the current release of the European standard ETSI TBR 10 or the CAT-iq™ audio test specification of the DECT Forum. It is equipped with two antennas (RefPP and RefFP), two AES/EBU, four USB and one Pulse interface.

In conjunction with the communication quality analysis system ACQUA* and other HEAD acoustics front ends, MFE X can be used for automated measurements according to international, user-defined or HEAD acoustics standards.

(* requires ACQUA 2.5.100 or later)

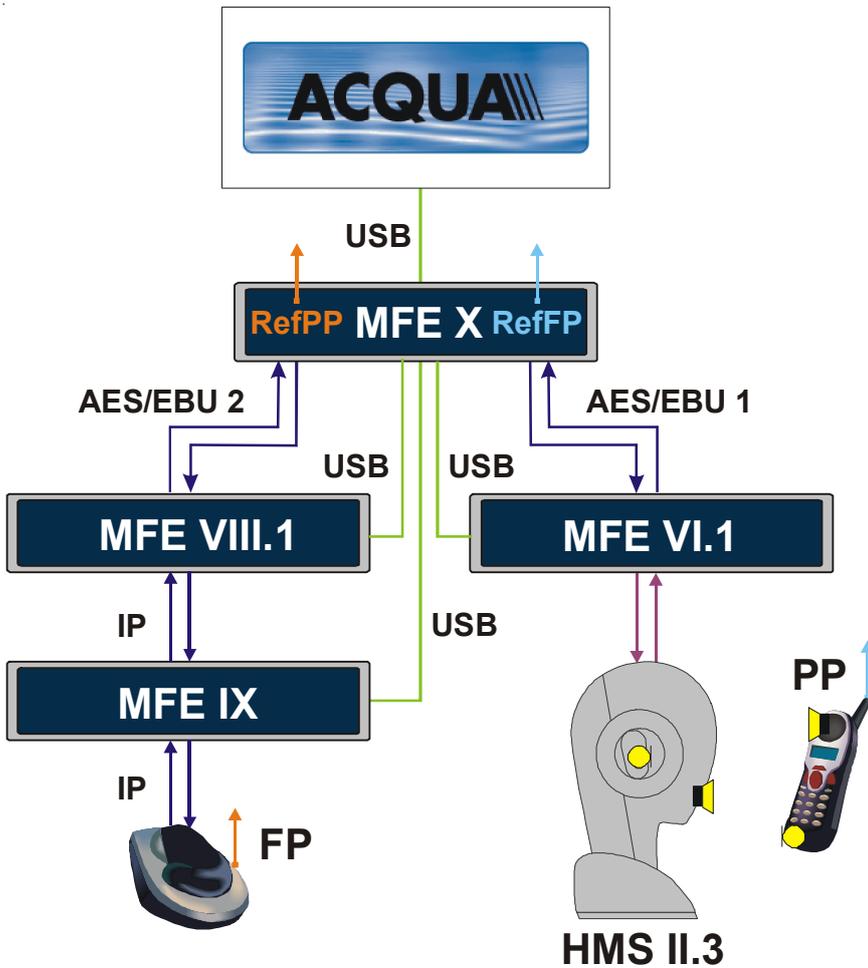
- Non-linear distortions (NLD) can be used in the echo path, e.g. for simulation of loudspeaker distortions or housing vibrations.
- Gain and noise level can be set.
- Up to three parallel delay lines with a maximum delay of 900 ms can be defined. For each delay line an attenuation value can be determined.

KEY FEATURES

- Wideband and IP capable
- Combines classic DECT with latest CAT-iq™ technology
- Complete control and automation via ACQUA

APPLICATIONS

- Acoustic measurements for CAT-iq™ certification according to CAT-iq™ audio test specification (in the currently valid release)
- DECT measurements, e.g. according to ETSI TBR 10 (current release)
- Objective, reproducible measurements of digital communication terminals and transmission systems
- Use of non-linear echo paths, e.g. for simulation of loudspeaker distortions or housing vibrations



Example configuration: CAT-iq™ acoustic measurements with analysis system ACQUA, artificial head HMS II.3, front ends MFE VI.1, MFE VIII.1, MFE IX and MFE X.

SYSTEM REQUIREMENTS

- **ACQUA (Code 6810 etc.):**
Advanced Communication Quality Analysis
Note: Valid SMA (software maintenance agreement) required!
- **PC** as specified by ACQUA datasheet
Depending on the measurement tasks, some or all of the following additional components may be required:
 - **HMS II.3** (artificial head measurement system) with HHP III (handset positioning mechanism),
 - **MFE VI.1** (analog measurement front end with integrated mouth amplifier),
 - **MFE VIII.1** (IP reference gateway)
 - **MFE IX** (IP network impairment simulator with WLAN/WiFi access point).

DELIVERY ITEMS

- **MFE X (Code 6481):**
NG-DECT/CAT-iq™ front end
- **PSH I.1 (Code 1364):**
External power supply, 110-250 V AC -> 15 V DC
- **PCC I.9x (Code 997x):**
Mains cable, country-specific
- **1x CUSB II.15 (Code 5478-15):**
Cable USB 2.0, with ferrite, 1.5 m
- **3x USB Cables**, short (ca. 0.5 m)
- **1x Pulse Breakout Cable**
- **2x CXX II.03:** AES/EBU cable, short
- **2x CXX III.03:** DC power supply cable (for MFE VIII & MFE IX)
- **2x Antennas** (RefPP & RefFP)
- **Carrying Case**
- **Manual**

Technical data – MFE X	
Measurement Unit	
Operation:	Control via ACQUA software (version 2.5.100 or later)
Power supply:	External power supply PSH I.1, 110-250 V AC -> 15 V DC, 8 W max.
Frequency bands:	1880-1900 MHz (Europe, some countries in Asia) and 1920-1930 MHz (DECT6.0/UPCS, North America)
Interfaces & Connectors	
Antenna DECT PP	1x at front, incl. screw-on turnable antenna (IEEE 802.11b/g)
Antenna DECT FP	1x at front, incl. screw-on turnable antenna (IEEE 802.11b/g)
AES EBU 1 In/Out	1x at rear, XLR, digital audio input/output, 48 kHz sampling rate, IEC II-subcode adjustable; 24 bit or 16 bit format selectable
AES EBU 2 In/Out	1x at rear, XLR, digital audio input/output, 48 kHz sampling rate, IEC II-subcode adjustable; 24 bit or 16 bit format selectable
Pulse In/Out	1x at rear, RS232, TTL level (absolute maximum ratings: min: -0.5V, max 5.5V), pulse inputs/outputs not galvanically separated
USB In	1x at rear, USB 2.0, control and data exchange with ACQUA
USB Out	3x at rear, USB 2.0, for control and data exchange with MFE VI.1, VIII.1, IX
DC In/Out	1x at rear, XLR 4 pin, DC-In looped through to DC-Out
Environmental Conditions	
Operating temperature range:	0°C - 50°C, 32°F - 122°F
Storage temperature range:	-20°C - 70°C, -4°F - 158°F
Air Humidity:	0 – 90 % rel. hum., non-condensing
Housing	
Overall dimensions (WxHxD):	327 mm x 44 mm x 230 mm
Weight:	ca. 2 kg

