

MUSICAL FIDELITY

192kHz UPSAMPLING  
32 BIT DAC

**M3x DAC**



## Instruction Manual

Manual in different languages available from [www.musicalfidelity.com](http://www.musicalfidelity.com)

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\*Manuals in other languages can be found on the Musical Fidelity website. Please navigate to the Downloads section of the M3x DAC product page to access them

## Safety Information

This unit is supplied with a mains lead fitted with a moulded 13-amp plug. If, for any reason, it is necessary to remove the plug, please remove the fuse holder and dispose of the plug safely, out of reach of children. It must not be plugged into a mains outlet.

The wires in the mains lead supplied with this appliance are coloured in accordance with the following code

Green and yellow .....	Earth
Blue .....	Neutral
Brown.....	Live

WARNING - This appliance MUST be earthed.

The colours of the wires of the mains lead of this appliance, may not correspond with the coloured markings identifying the terminals in the plug, proceed as follows:

- The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter E or coloured green or green-and-yellow, or by the earth symbol: 
- The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.
- The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
- If connecting to a BS1363 plug, a 13-amp fuse must be used.

## Precautions & User Information

**WARNING:** Any modifications to this product, not expressly approved by Musical Fidelity, who is the party responsible for standards compliance could void the user's authority to operate this equipment.

This new M3x DAC is designed and built to provide trouble-free performance. As with all electronic devices it is necessary to observe a few precautions:

- Heed all warnings shown on the back of the product.
- Only connect the M3x DAC to a mains outlet having the same voltage as marked at the back of the unit.
- Always ensure that when disconnecting and reconnecting your audio equipment the mains supply is switched off.
- Position the mains lead and signal interconnects where they are not likely to be walked on or trapped by items placed on them.
- Do not use near water, or place water-filled containers on the M3x DAC, for example, a flower vase or potted plants. If water does spill inside, immediately pull out the mains plug from the wall socket and inform the dealer, who should then check the unit before further use. Entry of liquid into the M3x DAC is dangerous and may cause electric shock or fire hazard.
- Do not place the unit near direct heat sources such as radiators, direct sunlight or other equipment.
- Do not remove any covers or try to gain access to the inside. There are no user adjustments or fuses to change without qualification. Refer all service work to an authorized Musical Fidelity agent.

Note: Unauthorized opening of the equipment will invalidate any warranty claim.

The electronics in modern hi-fi equipment are complex and may, therefore, be adversely affected or damaged by lightning. For protection of the audio system during electrical storms, remove the mains plugs. If after-sales service is required, to help the dealer identify the M3x DAC please quote the serial number located on the rear panel of the unit.

## **Installation**

### **Introduction**

This unit will deliver the ultimate performance possible from any digital source. It is designed to upgrade CD players, TVs, set-top-boxes, DAB tuners, USB Streamers and PCs and Laptops and any other source providing a variety of digital outputs.

Note: In normal operation, the unit dissipates a small quantity of power at all times, and it is important that it is adequately ventilated. The M3x DAC must be protected from humidity – if the unit is moved from a cold place to a warm room, leave the unit for an hour or so to allow sufficient time for the moisture to evaporate.

### **Cleaning**

Before cleaning the unit, switch off power at the mains switch and remove the mains plug from the wall socket. Clean the cabinet and remote-control unit using a moist cloth. Using solvents, white spirit or thinners is not advised, as they could damage the surface finish.

### **Installation**

Position the M3x DAC on a stable, horizontal surface where there is no risk of it being knocked or subjected to vibration such as from loudspeakers.

### **Power Connections**

The M3x DAC is supplied with a standard IEC mains cable which plugs into the IEC socket at the back of the unit.

### **Audio Output Connections**

**RCA audio outputs:** Use good quality RCA phono audio cables (fully connected signal and ground), for optimum signal transfer.

**XLR audio outputs:** Use good quality XLR audio cables (fully connected hot and cold signals and ground), for absolute optimum signal transfer.

### **Digital Input connections**

**COAXIAL inputs:** Connect RCA digital source to digital input RCA sockets. Use a good quality fully connected (signal and ground) coaxial digital cable, for optimum signal transfer.

**OPTICAL inputs:** Connect optical digital source to optical input socket. Use a good quality “Toslink” cable, for optimum signal transfer.

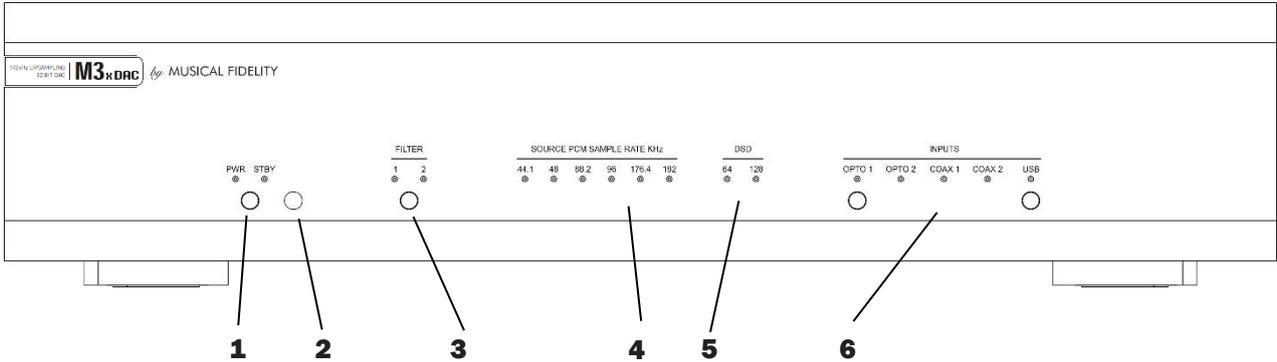
**USB input:** Connect computer or similar USB “host” source to USB input socket. Use a good quality USB 2.0 type cable (not supplied), for optimum signal transfer. Try to keep USB cable length to a minimum for best reliability. The USB standard maximum for a single cable is 5M, after which repeaters (normally mains-powered USB hubs) are required. We do however; recommend avoiding such a setup if at all possible.

### **Interconnects**

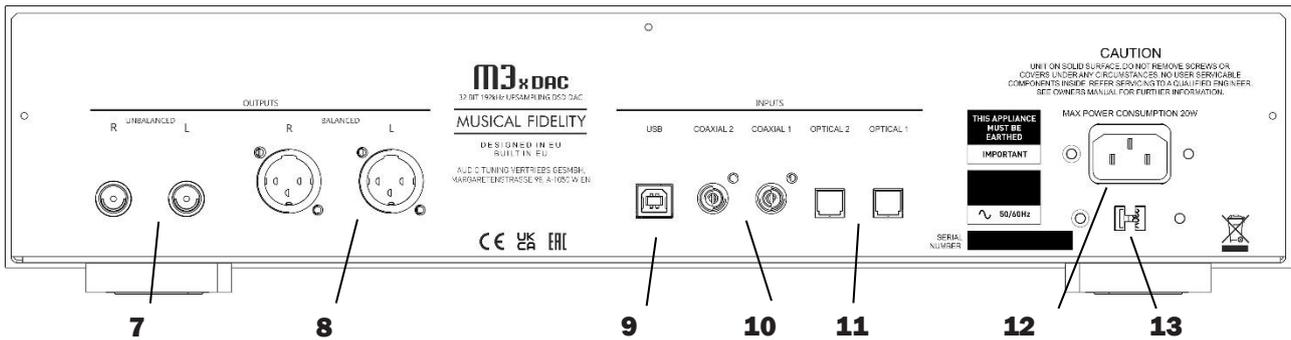
Note: Musical Fidelity currently do not make any interconnecting cables other than those supplied with the unit. Musical Fidelity does not endorse any other manufacturer’s cables.

If necessary, please refer to the dealer who can advise on quality cables for any particular setup.

## Facilities & Connections

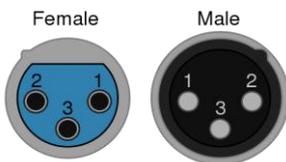


- |  |   |
|--|---|
| <p><b>1</b> Power/Standby/Mute button and LED's</p> <p><b>2</b> IR Receiver</p> <p><b>3</b> Filter selection</p> | <p><b>4</b> PCM Sample rate LED's</p> <p><b>5</b> DSD Sample rate LED's</p> <p><b>6</b> Input selection</p> |
|--|---|



- |   |   |
|---|---|
| <p><b>7</b> RCA Analogue output L/R</p> <p><b>8</b> XLR Balanced output L/R</p> <p><b>9</b> USB digital input</p> | <p><b>10</b> COAXIAL digital inputs 1,2</p> <p><b>11</b> OPTICAL digital inputs 1,2</p> <p><b>12</b> 230/110 V switch</p> <p><b>13</b> Mains IEC socket</p> |
|---|---|

### Standard XLR Balanced input/output lead connections:



### Pin functions:

- 1** Ground, 0V
- 2** Normal polarity ("hot" or "+")
- 3** Inverted polarity ("cold" or "-")

(for reference only, no XLR signal leads supplied)

## Operation

Once the M3x DAC unit is correctly wired up, and plugged into mains, the orange STBY led should be lit.

In this mode the M3x DAC is consuming a minimal amount of power.

To switch the unit on, press the Power button (1) on the front of the unit. The blue PWR indicator will light up.

## Input selection

The M3x DAC has a total of five inputs available. These are Optical 1 and 2, Coaxial 1 and 2 and also USB.

When the power cable is inserted into the Mains IEC socket **12** the Optical 1 input is selected by default.

When the M3x DAC is taken out of sleep mode, it will default to the last input selected.

From the front panel you can cycle through the inputs by using the ◀ and ▶ buttons (6). Pressing ▶ while on the USB input will cycle back to Optical 1. Whilst on Optical 1 the ◀ button will take you to the USB input again.

The remote control has direct access buttons for each input. Simply press the appropriate button to move directly to that input.

When a valid signal is received on the selected input, an indicator in either group **4** or **5** will light to show you the incoming sample rate.

## Optical and coaxial inputs

All optical and coaxial inputs are capable of accepting up to 24 bit 192 kHz PCM stereo data streams. The incoming data sample rate is displayed on the front panel LED's for reference.

Note: The indicators **4** and **5** show the actual sample rate of the digital data received by the M3x DAC. Some playback software may have altered this compared to the original file.

## USB Input

The USB input is capable of accepting up to 32 bit 192 kHz PCM and DSD 256 (DoP and native) data streams.

## Computer settings for USB

A good quality USB 2.0 cable is required to connect the unit to the computer. Normal USB standards stipulate that this should be 5M or less; and we recommend keeping it as short as possible.

**WARNING:** Older USB cables are often heavy and bulky and must be supported to avoid damage to the USB socket. Any physical damage caused to this socket will not be covered by warranty.

The computer should now detect the M3x DAC. A driver installation is only required on Windows.

- Linux kernel 2.6.33 or later (no driver required)
- Apple OS X® 10.6.4 or later (no driver required)
- Windows 10 Creators Edition or later (driver found on included CD or on Musical Fidelity website)

For playing native DSD on Windows a driver installation is required.

Any device that is compliant to the USB Audio Class 2.0 standard should also operate with the M3x DAC. However Musical Fidelity are unable to provide support for operation with anything other than the system listed above.

CD, MP3, WAV, AAC/+, OGG, FLAC, and any other audio file types played on suitable playback software will now play through the unit.

Note: This USB input has a high-speed serial data processor, and by its nature, requires a very high volume of USB bandwidth. It will benefit greatly from being the only device connected on its USB 'bus'. Sharing the same bus with other devices could cause unwanted artifacts such as dropouts or temporary loss of signal. This especially includes the use of the unit on a USB hub/splitter whether alongside other USB components or not. A direct connection to the host computer by shortest USB 2.0 lead possible is very much recommended.

## Digital Filters

The filters can be set with the buttons **3** on the front panel. For a detailed description of each filter see page 10.

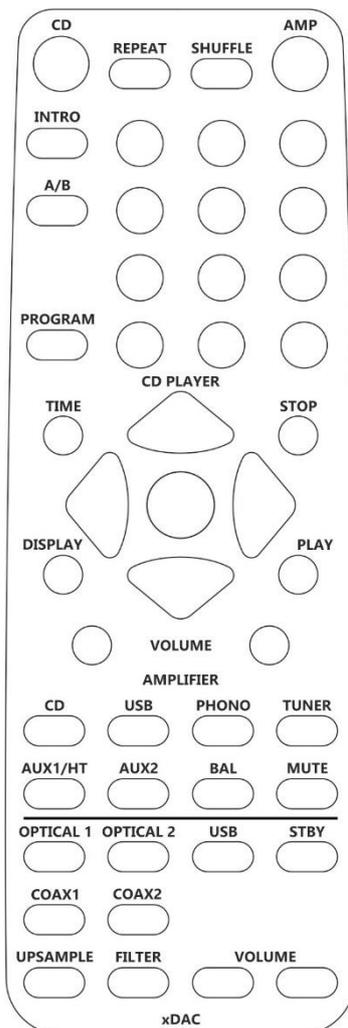
During DSD playback, the the DAC's internal DSD filters are turned on and you can choose between 2 different DSD filters.

## Upsampling

Upsampling is always on for PCM data up to 192kHz on any input. Incoming sample rates up to 192kHz are resampled to 192kHz.

## Outputs

On the rear of the unit are 2 sets of outputs. RCA (single ended) and XLR (balanced). You can connect the M3x DAC to your amplifier using whichever is more convenient.



## Remote Control Handset

The remote control shown below enables functions from this and other units from the M3, M5 and M6 ranges to be operated from a convenient distance.

The remote control buttons are split into 3 distinct areas.

The three rows of grey buttons at the bottom are used to control the M3xDAC and M6xDAC (and previous version of M6 DACs) and are detailed below.

The blue buttons control an amplifier such as the M6si. Consult the amplifier manual for more information.

The remaining grey buttons located in the upper section control a CD player such as M6scd. Consult the CD player manual for more information.

As the handset uses an invisible infra-red light beam, the front edge must be pointed directly towards the receiver window at the front of the player, without visual obstruction between them. If the range of the remote control greatly decreases, replace the batteries with new ones. Do not mix old and new batteries – two are required, size AAA, LR03 or SUM-4.

Please dispose of used batteries in accordance to local battery disposal regulations.

**OPTICAL 1** selects OPTICAL input 1

**OPTICAL 2** selects OPTICAL input 2

**COAX 1** selects COAXIAL input 1

**COAX 2** selects COAXIAL input 2

**USB** selects USB input

**STBY** switch the M3xDAC between standby and operating mode

**FILTER** selects digital filter

### Only for M6x DAC:

**UPSAMPLE** enables or disables upsampling

**VOLUME ▼ ▲** controls main output of M6xDAC in variable mode or headphone level (if headphones are connected)

## Digital Filters

### PCM filters

1. **Digital sharp roll-off filter** – Cutoff starting at roughly  $0.45 \times f_s$  (meaning 0.45 times the sample rate) and stopband at  $0.54 \times f_s$  at -98dB (meaning at half the sample rate this filter is reducing the signal by 96dB). Most complete frequency response, avoids aliasing, provides crisp clean highs.
2. **Digital slow roll-off filter** – Cutoff starting at roughly  $0.21 \times f_s$  and stopband at  $0.73 \times f_s$  at -80dB (meaning at roughly 75% of the sample rate this filter is reducing the signal by 80dB). Less pre and post ringing than the sharp roll-off filter resulting in tighter, more accurate reproduction of transient detail at the cost of decreased frequency response and increased aliasing.

### DSD filters

1. **Analogue FIR-3 filter** – Cutoff frequency at 85kHz.
2. **Analogue FIR-1 filter** – Cutoff frequency at 185kHz.

## Troubleshooting

<b>Problem</b>	<b>Probable Cause</b>	<b>Remedy</b>
No power.	Power plug is not inserted into socket correctly.	Plug in securely into unit's IEC socket.
Excessive hum from system speakers.	Audio connector plug not fully pushed in. Cable Fault. Unsuitable Cable (e.g. cable grounds not connected).	Insert plug securely. Check cable is connected at both ends. Some "esoteric" cables have internal wiring intentionally disconnected/modified. For best results on all inputs, please use good quality screened coax; signal and screen directly connected both ends.
Digital input not working.	No connection to that input. Incorrect input selected. Wrong data type sent to DAC.	Check connection and cable. Select correct input. Check source digital output is set for "16 bit stereo PCM" or similar. This particularly applies to some TVs, most DVD players, and other home theatre type devices that may give a multichannel digital output. Refer to the source's manual for further information.
No audio output, or too low level output.	Incorrect or missing connections. USB Driver not selected.	Check connections and make sure they are secure. See the Musical Fidelity website for relevant OS setup information.
Dropouts in sound.	Digital input lead not properly connected. Faulty digital input lead. Faulty optical lead.	Check input lead is fully secured. Change lead. Please use a good quality straight-through signal-and-ground phono to phono lead. Optical lead breakage. This can occur if the optical lead is bent into a radius too small. Avoid tight corners in routing optical leads.
No audio output from USB input.	USB Cable not connected. M6 USB Driver not selected.	Check connections and make sure they are secure. See software section for relevant OS setup information. Please check device is listed in device manager (Windows®) or in Sound, audio devices for MAC OS X. Make sure the Musical Fidelity USB audio device is selected as the default OUTPUT device. Check USB port functions with another device.
Not detected when connected to USB.	USB Cable faulty. USB not working/ enabled on computer. Correct USB drivers not installed.	Check and replace cable. Check USB port functions with another device. Download and install the device driver from the software downloads section on the Musical Fidelity website.
Dropouts in sound (USB input).	Shared USB port with another device. Computer busy with another application. Computer low on resources.	Avoid sharing the USB port with other devices, if possible. At times an application (program) may intervene, sometimes invisibly e.g. a virus scanner. When this happens, computer resources are temporarily used up, and playback may suffer. This is not a fault. Try running fewer applications if possible.

## Technical Specifications

<b>Output (RCA/XLR)</b> Output impedance Output, digital OdB level	< 50 ohms RCA 2V RMS, XLR 4V RMS
<b>DAC</b> SRC converter Total correlated jitter Linearity Frequency response Channel separation Signal to noise Total harmonic distortion Total harmonic distortion + noise	PCM1795 with 2 digital filters (2 for PCM and 2 for DSD). SRC4392 <48 picoseconds peak to peak <0.2dB down to -100dB -0,2dB at 20Hz, 0,1dB at 20kHz, 1,5dB at 70kHz < -115dB at 10kHz @ 0dBFS > 107dB „A“-wt. at 1kHz @ 0dBFS < 0,004% at 1kHz @ 0dBFS < 0,005% at 1kHz @ 0dBFS
<b>Connections</b> Line level outputs  Digital inputs	1 pair line level RCA (phono), left and right 1 pair line level XLR (balanced), left and right  2 RCA coaxial SPDIF in (up to 24bit/192kHz stereo PCM) 2 TOSLINK optical in (up to 24bit/192kHz stereo PCM) 1 USB 2.0 in for computer/PDA/other "host" (up to 32bit/192kHz stereo PCM, DSD256 DoP/native), fully asynchronous (Actual data determined by source file/computer software settings)
<b>Power requirement</b> Mains voltages Consumption	110 – 230 V max. 15W, <0,5W in standby
<b>Weight</b> Unit only, unboxed In shipping carton & inc. accessories	6,8 kg ca. 10,8 kg
<b>Unit dimensions</b> Wide High, including feet Deep (front to back) including terminals	440 mm 100 mm 378 mm

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## Item Disposal Information for Europe



### DISPOSAL

The crossed out wheeled bin label that appears on the back panel of the product indicates that the product must not be disposed of as normal household waste. To prevent possible harm to the environment please separate the product from other waste to ensure that it can be recycled in an environmentally safe manner. Please contact your local government office or your retailer for available collection facilities.



### DISPOSITION

La poubelle sur roulettes barrées X, qui apparaît en logo sur le panneau arrière du produit, indique que celui-ci ne doit pas être traité comme un déchet domestique commun. Afin de protéger l'environnement, ce produit électronique devra être géré séparément et donc recyclé selon les nouvelles normes Européennes Rohs concernant les déchets d'appareils électroniques. Prière de contacter les services concernés gouvernementaux ou votre point de vente pour l'élimination et l'enlèvement de déchets électroniques équipés de composants électroniques.



### DISPOSAL

La etiqueta cruzada hacia fuera del compartimiento que aparece en el panel trasero del producto indica que el producto no se debe reciclar como basura normal de la casa. Para prevenir daños posible al ambiente separe por favor el producto de otras basura para asegurarse de que puede ser reciclada de una manera ambientalmente segura. Entre en contacto por favor a su oficina gubernamental local o a su minorista para las instalaciones disponibles de la colección.



### RIFIUTI

L'etichetta del cassonetto barrato riportato sul retro dell'apparecchio indica che il prodotto non deve essere smaltito tramite la procedura normale di smaltimento dei rifiuti domestici. Per evitare eventuali danni all'ambiente, separare questo prodotto da altri rifiuti domestici in modo che possa venire riciclato in base alle procedure di rispetto ambientale. Per maggiori dettagli sulle aree di raccolta disponibili, contattate l'ufficio governativo locale od il rivenditore del prodotto.



### FACHGERECHTE ENTSORGUNG:

Das auf der Geräteückseite angebrachte Label deutet darauf hin, dass das Produkt nicht mit konventionellem Hauskehricht entsorgt werden darf. Um Schäden und Verschmutzungen an Umwelt und Mensch zu vermeiden, muss das Produkt fachgerecht entsorgt und von anderem Abfall getrennt werden. Wenden Sie sich bei Fragen hierzu an Ihren Fachhändler oder an eine öffentliche Informationsstelle.

### AFVAL

Het label op de achterzijde van dit apparaat, een afvalbak op wielen met een kruis doorgehaald, geeft aan dat dit apparaat niet samen met gewoon huishoudafval mag worden weggegooid. Om mogelijke schade aan onze leefomgeving te voorkomen dient dit apparaat, gescheiden van gewoon huishoudelijk afval, te worden afgevoerd zodat het op een milieuvriendelijke manier kan worden gerecycled. Neem voor beschikbare inzamelplaatsen contact op met uw gemeentelijke reinigingsdienst of met uw elektronica leverancier.



### HÄVITTÄMINEN

Yliuksattua jäteastiaa kuvaava tarra tuotteen takalevyssä kertoo, että tuotetta ei saa käsitellä normaalin talousjätteenä. Ympäristön suojelemiseksi on tuote pidettävä erillään muusta jätteestä ja se on kierrätettävä ekologisesti kestäväällä tavalla. Ota yhteyttä laitteen myyjään tai Pirkanmaan Ympäristökeskukseen lähimmän kierrätyskeskuksen löytämiseksi.



### AFSKAFNING

Logoet med en skraldespand med kryds over på bagsiden af apparatet indikerer at dette produkt ikke må kasseres som normal husholdningsaffald. For at forebygge mulig skade på miljøet, bedes De separere dette produkt fra andet affald, og sikre at det bliver genbrugt på en miljørigtig måde. Kontakt venligst de lokale myndigheder eller din forhandler for oplysning om nærmeste tilgængelige opsamlingssted for elektronikaffald.



### ΔΙΑΔΙΚΑΣΙΑ ΑΠΟΡΡΙΨΗΣ

ΤΟ ΣΗΜΑ ΜΕ ΤΟΝ ΔΙΑΓΕΓΡΑΜΜΕΝΟ ΤΡΟΧΗΛΑΤΟ ΚΑΔΟ ΑΠΟΡΡΙΜΑΤΩΝ ΣΤΗΝ ΠΙΣΩ ΟΨΗ ΤΟΥ ΜΗΧΑΝΗΜΑΤΟΣ ΔΗΛΩΝΕΙ ΟΤΙ ΤΟ ΠΡΟΙΟΝ ΑΥΤΟ ΔΕΝ ΠΡΕΠΕΙ ΝΑ ΔΙΑΧΕΙΡΙΣΘΕΙ ΣΑΝ ΣΥΝΗΘΙΣΜΕΝΟ ΟΙΚΙΑΚΟ ΑΠΟΒΛΗΤΟ. ΠΡΟΣ ΑΠΟΦΥΓΗ ΕΝΔΕΧΟΜΕΝΗΣ ΕΠΙΒΑΡΥΝΣΗΣ ΤΟΥ ΠΕΡΙΒΑΛΛΟΝΤΟΣ, ΞΕΧΩΡΙΣΤΕ ΤΟ ΠΡΟΙΟΝ ΑΠΟ ΤΑ ΑΛΛΑ ΑΠΟΡΡΙΜΑΤΑ ΩΣΤΕ ΝΑ ΕΞΑΣΦΑΛΙΣΘΕΙ Η ΑΝΑΚΥΚΛΩΣΗ ΤΟΥ ΜΕ ΤΟΝ ΠΡΕΠΟΝΤΑ ΤΡΟΠΟ. ΠΑΡΑΚΑΛΟΥΜΕ ΝΑ ΕΠΙΚΟΙΝΩΝΗΣΕΤΕ ΜΕ ΤΗΝ ΤΟΠΙΚΗ ΥΠΗΡΕΣΙΑ ΑΝΑΚΥΚΛΩΣΗΣ Η ΜΕ ΤΟ ΚΑΤΑΣΤΗΜΑ ΑΓΟΡΑΣ ΓΙΑ ΠΕΡΙΣΣΟΤΕΡΕΣ ΛΕΠΤΟΜΕΡΕΙΕΣ.

