

OWNER'S MANUAL

MANUEL DE L'UTILISATEUR

DLMS
4080

VTC
PRO AUDIO

IMPORTANT SAFETY INSTRUCTIONS



This lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Ce symbole d'éclair avec tête de flèche dans un triangle équilatéral est prévu pour alerter l'utilisateur de la présence d'un « voltage dangereux » non-isolé à proximité de l'enceinte du produit qui pourrait être d'ampleur suffisante pour présenter un risque de choc électrique.



CAUTION AVIS

**RISK OF ELECTRIC SHOCK
DO NOT OPEN**

**RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR**



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Le point d'exclamation à l'intérieur d'un triangle équilatéral est prévu pour alerter l'utilisateur de la présence d'instructions importantes dans la littérature accompagnant l'appareil en ce qui concerne l'opération et la maintenance de cet appareil.



S2125A

FOLLOW ALL INSTRUCTIONS

**Instructions pertaining to a risk of fire,
electric shock, or injury to a person**

**CAUTION: TO REDUCE THE RISK OF ELECTRIC
SHOCK, DO NOT REMOVE COVER (OR BACK).**

NO USER SERVICEABLE PARTS INSIDE.

**REFER SERVICING TO QUALIFIED
SERVICE PERSONNEL.**

SUIVEZ TOUTES LES INSTRUCTIONS

**Instructions relatives au risque de feu,
choc électrique, ou blessures aux personnes**

**AVIS: AFIN DE REDUIRE LES RISQUE DE CHOC
ELECTRIQUE, N'ENLEVEZ PAS LE COUVERT (OU LE
PANNEAU ARRIERE) NE CONTIENT AUCUNE PIECE**

REPARABLE PAR L'UTILISATEUR.

**CONSULTEZ UN TECHNICIEN QUALIFIE
POUR L'ENTRETIEN**

Read Instructions: The Owner's Manual should be read and understood before operation of your unit. Please, save these instructions for future reference and heed all warnings.

Clean only with dry cloth.

Packaging: Keep the box and packaging materials, in case the unit needs to be returned for service.

Warning: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. *Do not use this apparatus near water!*

Warning: When using electric products, basic precautions should always be followed, including the following:

Power Sources

Your unit should be connected to a power source only of the voltage specified in the owners manual or as marked on the unit. This unit has a polarized plug. Do not use with an extension cord or receptacle unless the plug can be fully inserted. Precautions should be taken so that the grounding scheme on the unit is not defeated. An apparatus with CLASS I construction shall be connected to a Mains socket outlet with a protective earthing ground. Where the MAINS plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.

Hazards

Do not place this product on an unstable cart, stand, tripod, bracket or table. The product may fall, causing serious personal injury and serious damage to the product. Use only with cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the product. Follow the manufacturer's instructions when installing the product and use mounting accessories recommended by the manufacturer. Only use attachments/accessories specified by the manufacturer

Note: Prolonged use of headphones at a high volume may cause health damage on your ears.

The apparatus should not be exposed to dripping or splashing water; no objects filled with liquids should be placed on the apparatus.

Terminals marked with the "lightning bolt" are hazardous live; the external wiring connected to these terminals require installation by an instructed person or the use of ready made leads or cords.

Ensure that proper ventilation is provided around the appliance. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

No naked flame sources, such as lighted candles, should be placed on the apparatus.

Power Cord

Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet. The AC supply cord should be routed so that it is unlikely that it will be damaged. Protect the power cord from being walked on or pinched particularly at plugs. If the AC supply cord is damaged DO NOT OPERATE THE UNIT. To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle. The mains plug of the power supply cord shall remain readily operable.

Unplug this apparatus during lightning storms or when unused for long periods of time.

Service

The unit should be serviced only by qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Veillez Lire le Manuel: Il contient des informations qui devraient étre comprises avant l'opération de votre appareil. Conservez. Gardez S.V.P. ces instructions pour consultations ultérieures et observez tous les avertissements.

Nettoyez seulement avec le tissu sec.

Emballage: Conservez la boîte au cas où l'appareil devait étre retourner pour réparation.

Avertissement: Pour réduire le risque de feu ou la décharge électrique, n'exposez pas cet appareil à la pluie ou à l'humidité. *N'utilisez pas cet appareil près de l'eau!*

Attention: Lors de l'utilisation de produits électrique, assurez-vous d'adhérer à des précautions de bases incluant celle qui suivent:

Alimentation

L'appareil ne doit étre branché qu'à une source d'alimentation correspondant au voltage spécifié dans le manuel ou tel qu'indiqué sur l'appareil. Cet appareil est équipé d'une prise d'alimentation polarisée. Ne pas utiliser cet appareil avec un cordon de raccordement à moins qu'il soit possible d'insérer complètement les trois lames. Des précautions doivent étre prises afin d'éviter que le système de mise à la terre de l'appareil ne soit désengagé. Un appareil construit selon les normes de CLASS I devrait étre raccordé à une prise murale d'alimentation avec connexion intacte de mise à la masse. Lorsqu'une prise de branchement ou un coupleur d'appareils est utilisée comme dispositif de débranchement, ce dispositif de débranchement devra demeurer pleinement fonctionnel avec raccordement à la masse.

Risque

Ne pas placer cet appareil sur un chariot, un support, un trépied ou une table instables. L'appareil pourrait tomber et blesser quelqu'un ou subir des dommages importants. Utiliser seulement un chariot, un support, un trépied ou une table recommandés par le fabricant ou vendus avec le produit. Suivre les instructions du fabricant pour installer l'appareil et utiliser les accessoires recommandés par le fabricant. Utilisez seulement les attachements/accessoires indiqués par le fabricant

Note: L'utilisation prolongée des écouteurs à un volume élevé peut avoir des conséquences néfastes sur la santé sur vos oreilles. .

Il convient de ne pas placer sur l'appareil de sources de flammes nues, telles que des bougies allumées.

L'appel ne doit pas étre exposé à des égouttements d'eau ou des éclaboussures et qu'aucun objet rempli de liquide tel que des vases ne doit étre placé sur l'appareil.

Assurez que l'appareil est fourni de la propre ventilation. Ne procédez pas à l'installation près de source de chaleur tels que radiateurs, registre de chaleur, fours ou autres appareils (incluant les amplificateurs) qui produisent de la chaleur.

Les dispositifs marqués d'une symbole "d'éclair" sont des parties dangereuses au toucher et que les câblages extérieurs connectés à ces dispositifs de connexion extérieure doivent étre effectués par un opérateur formé ou en utilisant des cordons déjà préparés.

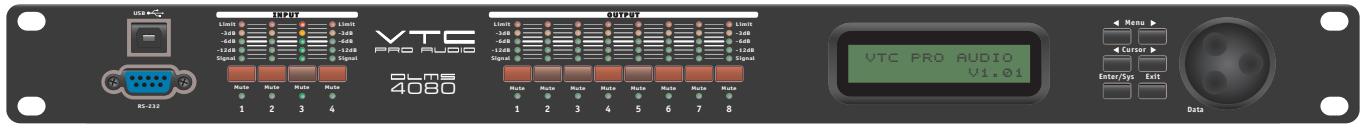
Cordon d'Alimentation

Ne pas enlever le dispositif de sécurité sur la prise polarisée ou la prise avec tige de mise à la masse du cordon d'alimentation. Une prise polarisée dispose de deux lames dont une plus large que l'autre. Une prise avec tige de mise à la masse dispose de deux lames en plus d'une troisième tige qui connecte à la masse. La lame plus large ou la tige de mise à la masse est prévu pour votre sécurité. La prise murale est désuète si elle n'est pas conçue pour accepter ce type de prise avec dispositif de sécurité. Dans ce cas, contactez un électricien pour faire remplacer la prise murale. Évitez d'endommager le cordon d'alimentation. Protégez le cordon d'alimentation. Assurez-vous qu'on ne marche pas dessus et qu'on ne le pince pas en particulier aux prises. N'UTILISEZ PAS L'APPAREIL si le cordon d'alimentation est endommagé. Pour débrancher complètement cet appareil de l'alimentation CA principale, déconnectez le cordon d'alimentation de la prise d'alimentation murale. Le cordon d'alimentation du bloc d'alimentation de l'appareil doit demeurer pleinement fonctionnel.

Débranchez cet appareil durant les orages ou si inutilisé pendant de longues périodes.

Service

Consultez un technicien qualifié pour l'entretien de votre appareil. L'entretien est nécessaire quand l'appareil a été endommagé de quelque façon que se soit. Par exemple si le cordon d'alimentation ou la prise du cordon sont endommagés, si il y a eu du liquide qui a été renversé à l'intérieur ou des objets sont tombés dans l'appareil, si l'appareil a été exposé à la pluie ou à l'humidité, si il ne fonctionne pas normalement, ou a été échappé.



VTC DLMS4080

Welcome to the **VTC Pro Audio** family. The **DLMS4080** System is one of the most advanced and easiest to manage loudspeaker processor in the audio industry. The **DLMS4080** features 40-bit floating point processors and high performance 24-bit analog converters which achieves the highest quality of sound reproduction. Using a high-bit DSP prevents noise and distortion that usually gets introduced by truncation errors that are common when 24-bit fixed-point devices are used.

Designed for touring or fixed sound installations, the **DLMS4080** is the digital control center for the **VTC Pro Audio Elevation** loudspeaker array systems. The four inputs and eight outputs can be configured easily – in real-time, directly from the front control panel. It can also be controlled remotely using a PC using **USB**, **RS-232** or **Ethernet**. **RS-232**, **Ethernet** and **USB** ports are included to provide unprecedented options for setting up your system.

The **DLMS4080** has a comprehensive set of system control parameters. Each input's level and compression can be set individually. Output parameters include delay, polarity, limiting, an 8-band parametric and a 31-band graphic EQ per channel. Precise 1Hz precision resolution allows you to contour your system with pin-point accuracy.

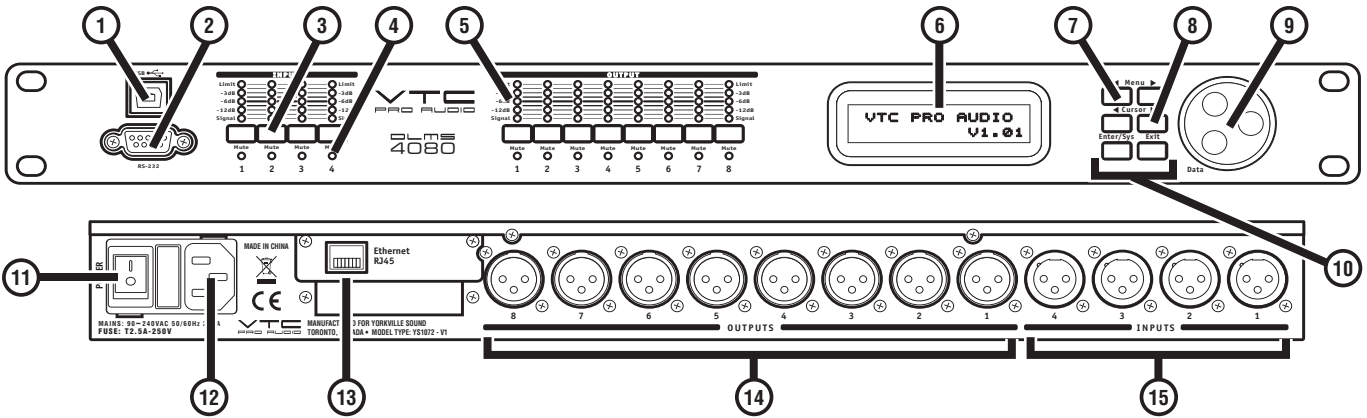
Additionally, the software included on the included CD has been developed with an intuitive graphical user interface which makes setup a snap, even when setting up complex systems. Up to 32 separate setups can be stored in the onboard memory module. The **DLMS4080** also features an onboard lockout for full system security when used in permanent installation applications.

Note: Software upgrades for internal CPU and DSP are enabled via a PC connection which keeps the device current with newly developed algorithms and functions (when available).

Check <http://www.vtcproudio.com> for updates.

Features

- Flexible routing between Inputs and Outputs
- 40-bit floating point DSP (Highly accurate digital processing)
- High Performance 24-bit A/D and D/A Converters
- Accurate 1 Hz Frequency Resolution
- 8 Parametric Equalizers for each Input and Output
- 31-Band Graphic Equalizer for each input channel
- Multiple Crossover types with Full-Function Compressors on Input Channels and Limiters on Output Channels
- Precision Level, Polarity and Delay control
- CPU and DSP upgrade via PC
- Individual Channel Push-Buttons with the capability of Linking channels together for programming
- Backlit 2-Line x 16 Character LCD Display
- Full 5-segment LEDs on every Input and Output
- Storage of up to 30 Program Setups. The **DLMS4080** comes preprogrammed for VTC Pro Audio Elevation Systems
- USB, RS232 and Ethernet Interfaces for PC Control and Configuration
- Expandable for future updates, upgrades and options
- Security Lock



Configuration

Connectors

The DLMS4080 can be set up and configured with a computer using **USB**, **RS-232** or **Ethernet**.

Tech Note: Do Not plug your DLMS4080 into a computer until the proper drivers are installed!! The proper device drivers are located on the included CD.

- i. **USB Connector ①** – Located on the front panel, the Universal Serial Bus (**USB**) connector is a standard Type B **USB** connector.
- ii. **RS-232 ②** – Located on the front panel below the **USB** connector is the standard **DB-9** connector for use with a standard **RS-232 DB-9** serial cable connected directly to your computer.
- iii. **Ethernet ③** – Located on the rear panel, beside the IEC power receptacle is a standard **RJ45** Ethernet connector. This can be used to remotely control and program the **DLMS4080**.

User Tip: a wireless hub can be used to more easily interface with the DLMS4080.

Mute Push-Buttons ③

Each channel features its own Mute push-button. When muted, a red LED will illuminate signifying the channel is muted.

User Tip: The push-button is also used to select individual and multiple channels when programming (described below, Channel Selection and Linking for Programming).

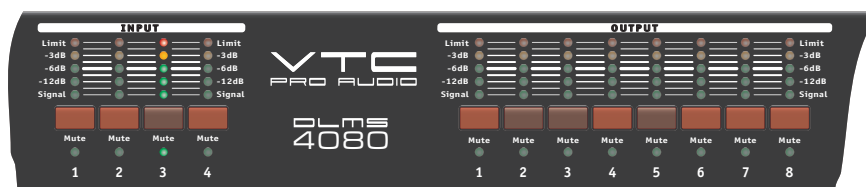
Channel Selection and Linking for Programming ④

When either Menu push-button is held down, select the channel to be modified by using the Mute pushbutton; a green LED below the push-button will illuminate signifying your selection. The last modification menu will be displayed on the LCD. To select multiple channels for linking and programming similar parameters, hold down either Menu Control and choose the channels to be linked (or unlinked) by pressing their corresponding Mute push-button. To exit these menus press the Exit push-button.

Note: Input channels cannot be linked with output channels.

Signal, Peak Level and Limit LEDs ⑤

When a signal is present, the Signal LED will illuminate on the corresponding Input channel's LED display bar. The LEDs marked as Limit also act as Peak LEDs which indicate the current peak level of the Signal. These LEDs indicate the **DLMS4080's** maximum headroom and also reference the threshold of the compressor/limiter.

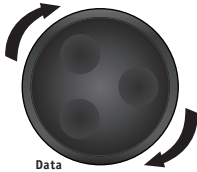
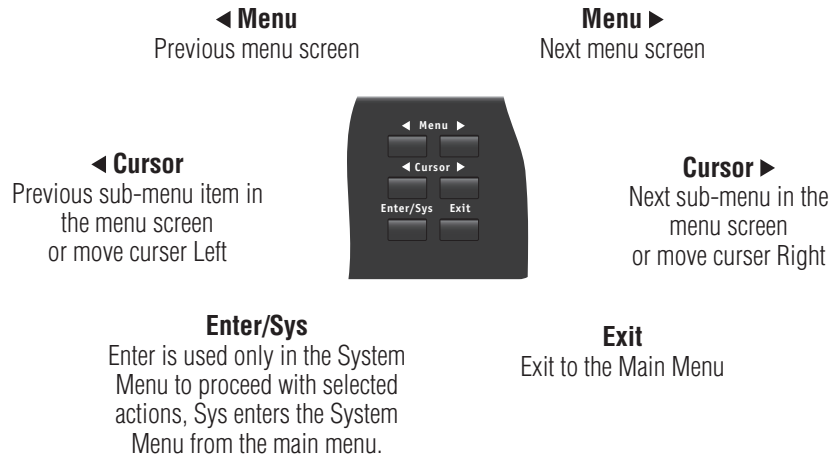


LCD Display ⑥

Necessary information and settings for the **DLMS4080** are displayed on the LCD Display. The display is 2-Line by 16 Characters LCD backlit display.

Menu Keys ⑦ ⑧ ⑩

There are 6 menu keys identified as: **◀ Menu** (menu back), **Menu ▶** (menu forward), **◀ Cursor**, **Cursor ▶**, **Enter/Sys**, and **Exit**.



Data Wheel ⑨

The rotary thumb wheel changes parameter data values and settings. This data wheel is travel velocity sensing, which makes it easy when large incremental data modifications are needed, simply rotate faster for accelerated changes.

Power Switch ⑪

The rear mounted power switch turns the main power to the DLMS4080 On or Off.

XLR Input and Outputs ⑭ ⑮

Individual balanced XLR jacks are used for each audio input and output. All I/O connectors have pin 1 as ground (shield), pin 2 as (+) and pin 3 as (-).

Main Power Receptacle and Fuse ⑰

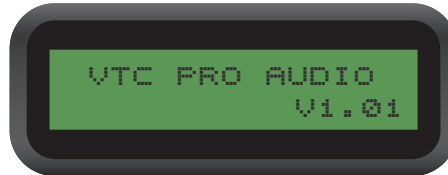
AC power connects using a standard IEC socket, operable voltage is 90-250VAC, 50-60Hz. A compatible power cord is supplied with the unit.



Main Fuse: T2.5A 250V *Slowblo*

Powering Up the DLMS4080

When the **DLMS4080** is powered up, the initialization process begins and takes about 8-seconds. During that period, the display shows the model and firmware version currently loaded into the **DLMS4080**.

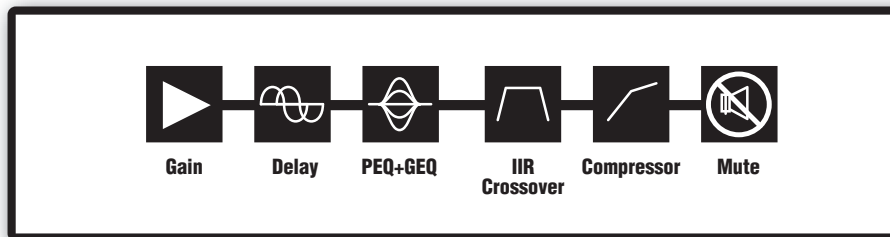


Once the initialization process is finished, the **DLMS4080** displays the current program number and program name assigned to the unit. If the 2 fields are empty, it means that no program is assigned, the last data before previous power down is recalled instead.

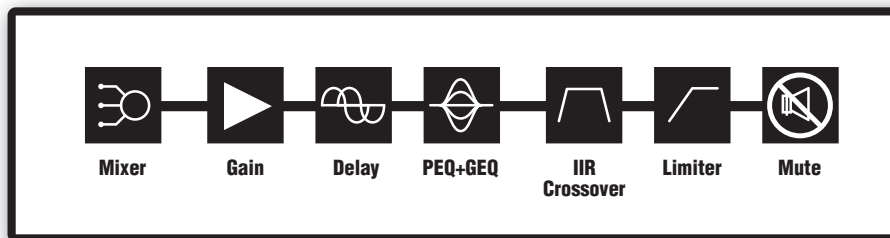


The **DLMS4080** is ready to operate.

INPUT SIGNAL CHAIN



OUTPUT SIGNAL CHAIN



Operating the DLMS4080



User Tip: Channel Linking Selection – While holding down a Menu key, more than 1 channel from the same group (Input or Output group) can be selected to link the channels together. The green LEDs below the Mute buttons are illuminated for the linked channels. Modification of the parameters for the selected channel will be applied to the linked channels as well. To cancel the linking, simply deselect the desired channel while the Menu key is still held down. If the Menu Control key is already released, press the Exit key to exit.

Input Menus

When an Input channel is selected for modification (To link channels together see **Channel Selection and Linking for Programming**) the Input menu parameters can be accessed by pressing the **Menu ▶** push-button to advance from the **SIGNAL Menu**, **EQ Menu**, **31-Band EQ Menu**, the **Xover Menu**, and finally the **Compressor Menu**. (Use the **◀ Menu** push-button to go backward from the **Compressor Menu**, the **XOver Menu**, **31-Band EQ Menu**, the **EQ Menu** and then finally back to the **SIGNAL Menu**). Use the Data wheel to change the parameter's settings.

1. Signal Menu (Signal)

Input channel signal menus can be selected by pressing the **Cursor ▶** push-button to advance from **LEVEL** to **POL** and finally to **DELAY**. (Use the **◀ Cursor** push-button to go backward from **DELAY** to **POL** then to **LEVEL**). Use the Data wheel to change the parameter's settings.

Menu ▶ LEVEL – Gain can be set from -40.00dB to +15.00dB in 0.25dB steps.



Cursor ▶ POL – Polarity, can be normal, (+) 0-degrees or inverted (-) 180-degrees.



Cursor ▶ DELAY – Delay in 21 user steps. Can be displayed in ms, ft or m. The system time unit of the delay can be changed in the System menu. The maximum delay permitted is 4,800 steps (100ms).



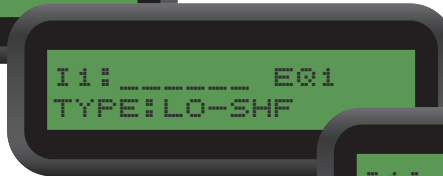
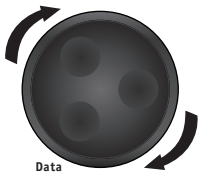
2. Equalizer Menu (EQ_)

EQ parameters can be set by pressing the **Cursor** ► push-button to advance from **EQ#** to **Type**, **Freq**, **BW** and finally to **Level**. (Use the ◀ **Cursor** push-button to go backward from **Level** to **BW**, **Freq**, **Type** then to **EQ#**). Use the Data wheel to change the parameter's settings.

Menu ► **EQ#** - Selects one of the 8 available Equalizers.



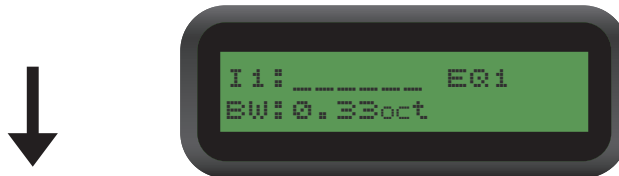
Cursor ► **TYPE** – The types of equalization can be set to parametric (PEQ), Lo-shelf (LO-SHF) or Hi-shelf (HI-SHF).



Cursor ► **FREQ** – EQ center frequency; the equalizer's centered frequency can be set anywhere within the range from 20 to 20,000Hz, in either 1Hz steps or 1/36 octave steps. The sampling rate and the frequency steps can be selected in the System Menu.



Cursor ► **BW** – EQ Bandwidth. The equalizer's bandwidth ranges from 0.02 to 2.50 octaves and can be set in 0.01 octave steps for PEQ (see EQ TYPE). For LO-SHF or HI-SHF, it is either 6 or 12dB/Octave.



Cursor ► **LEVEL** – EQ level gain. The EQ level can be set from -30.00dB to +15.00dB in 0.25dB steps.



3. 31-Band Graphic Equalizer Menu (GEQ_)

Graphic EQ parameters can be set by pressing the **Cursor ▶** push-button to advance from **GEQ#** to **Level**. (Use the **◀Cursor** push-button to go backward from **Level** to **GEQ#**). Use the Data wheel to change the parameter's settings.

Menu ▶ **GEQ#** – Selects one of the 31 available Equalizers bands. The frequency for each band is displayed



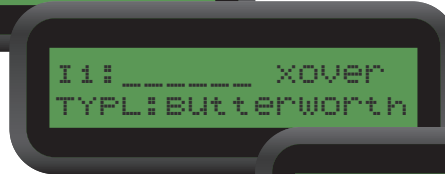
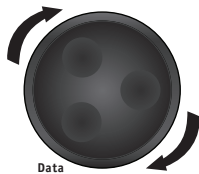
Cursor ▶ **LEVEL** – Graphic EQ level gain. The EQ level can be set from -30.00dB to +15.00dB in 0.25dB steps.



4. XOver Menu

Crossover parameters can be set by pressing the **Cursor ▶** push-button to advance from **TYPL** to **FRQL**, **SLPL**, **TYPH**, **FRQH** and finally to **SLPH**. (Use the **◀Cursor** push-button to go backward from **SLPH** to **FRQH**, **TYPH**, **SLPL**, **FRQL**, then to **TYPL**). Use the Data wheel to change the parameter's settings.

Menu ▶ **TYPL** – Choose between Butterworth, Linkwitz-Riley or Bessel crossover Filter Types for the low frequency crossover point (high pass).



Cursor ▶ **FRQL** – Filter cut-off Frequency of low frequency crossover point (high pass). Ranges from 20 to 20,000Hz in either 1 Hz steps or 1/36 octave steps. The frequency steps can be selected in the System Menu.





Cursor ▶ SLPL – Filter Slope of low frequency crossover point (high pass). Ranges from 6 to 48dB/octave. If the selected Filter Type is Linkwitz-Riley, the available slopes are 12 / 24 / 36 / 48 dB/octave.



Cursor ▶ TYPH – Filter Type of high frequency crossover point (low pass).



Cursor ▶ FRQH – Filter cut-off Frequency of high frequency crossover point (low pass).



Cursor ▶ SLPH – Filter Slope of high frequency crossover point (low pass).



CROSSOVER FILTER CONFIGURATIONS

Configuration	Crossover Point		Graph
	Low	High	
None	Off	Off	
High Pass	TYPL (ON)	TYPH (OFF)	
Low Pass	TYPL (OFF)	TYPH (ON)	
Band Pass	TYPL (ON)	TYPH (ON)	

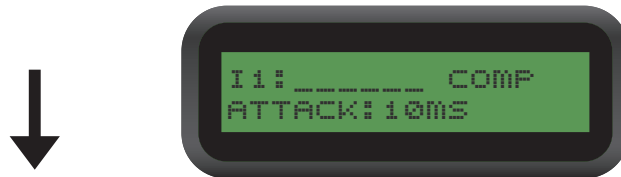
5. Compressor Menu

Compression parameters can be set by pressing the **Cursor ▶** push-button to advance from **THRESH** to **ATTACK**, **RELEASE** and finally to **RATIO**. (Use the **◀ Cursor** push-button to go backward from **RATIO** to **RELEASE**, **ATTACK** then to **THRESH**). Use the Data wheel to change the parameter's settings.

Menu ▶ THRESH – Limit Threshold. Ranges from -20 to +20dBu in 0.5dB steps.



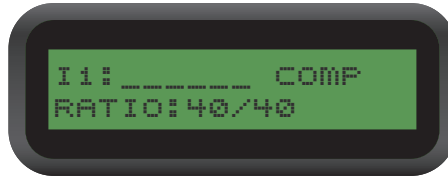
Cursor ▶ ATTACK – Attack time. Ranges from 0.3 to 1ms in 0.1ms steps, then ranges from 1 to 100ms in 1 ms steps.



Cursor ▶ RELEASE – Release time. Can be set at 2X, 4X, 8X, 16X or 32X the attack time.



Cursor ▶ RATIO – Slope in which the signal is compressor. Ranges from 1/40 to 40/40.



6. Name

All channels can be named to help identify the channel or function. The Input Channel Name can be set by pressing the **Cursor ▶** push-button to advance to the next character. (Use the **◀ Cursor** push-button to go backwards). Use the Data wheel to change the character on the display.

Menu ▶ NAME – Channel name. A maximum of 6 characters in length.



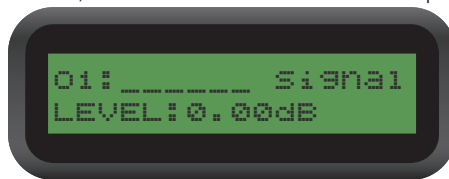
Output Menus

When an Output Channel, or channels are selected for modification (see **Channel Selection and Linking for Programming**) the Output menu parameters can be accessed by pressing the **Menu ▶** push-button to advance from the **SIGNAL Menu** to the **EQ Menu** and finally the **XOver Menu**. (Use the **◀ Menu** push-button to go backward from the **XOver Menu** to **EQ Menu** then finally the **SIGNAL Menu**). Use the Data wheel to change the parameter's settings.

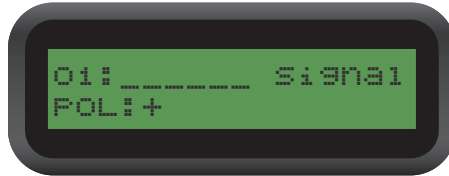
1. Signal Menu

Output channel signal menus can be chosen by pressing the **Cursor ▶** push-button to advance from **LEVEL** to **POL** and finally to **DELAY**. (Use the **◀ Cursor** push-button to go backward from **DELAY** to **POL** then to **LEVEL**). Use the Data wheel to change the parameter's settings.

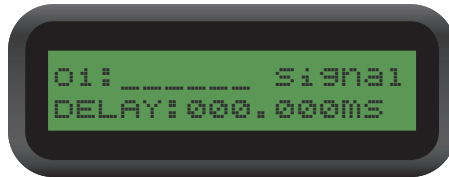
Menu ▶ **LEVEL** – Gain, -40.00dB to +15.00dB in 0.25dB steps.



Cursor ▶ **POL** – Polarity, can be normal (+) or inverted (-).



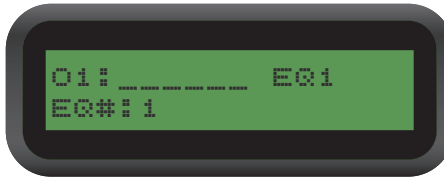
Cursor ▶ **DELAY** – Delay settings are displayed in ms, ft or m. The time unit of the delay can be changed in the System menu. The maximum delay permitted is 4,800 steps (100ms).



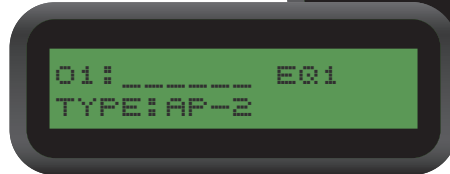
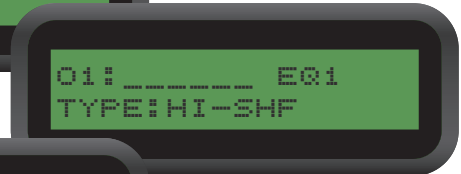
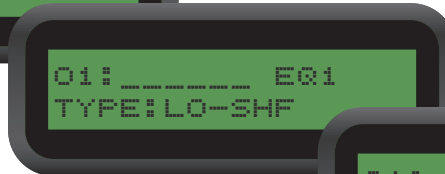
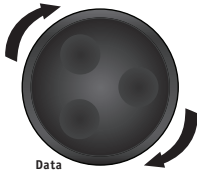
2. EQ Menu

EQ parameters can be set by pressing the **Cursor ▶** push-button to advance from **EQ#** to **LEVEL**, **Freq**, **EQ BW** and finally to **EQ Type**. (Use the **◀ Cursor** push-button to go backward from **EQ Type** to **EQ BW**, **EQ Freq**, **EQ Level** then to **EQ#**). Use the Data wheel to change the parameter's settings.

Menu ▶ **EQ#** – Selects one of the 8 available Equalizers.



Cursor ▶ **TYPE** – The types of equalization can be set to parametric (**PEQ**), low-shelf (**LO-SHF**), high-shelf (**HI-SHF**), and two all-pass options (**AP-1** and **AP-2**). All-pass EQ Types use slightly different options, instead of using bandwidth (**BW**) and level (**LEVEL**) you can change the phase angle (**Deg**).



See description of different EQ TYPE options on next page!

EQ Types Options for PEQ, LO-SHF and HI-SHF

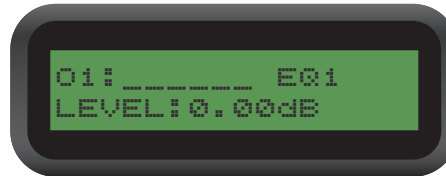
Cursor ▶ **FREQ** – EQ center frequency; the equalizer's centered frequency can be set anywhere within the range from 20 to 20,000Hz, in either 1Hz steps or 1/36 octave steps. The sampling rate and the frequency steps can be selected in the System Menu.



Cursor ▶ **BW** – EQ Bandwidth. The equalizer's bandwidth ranges from 0.02 to 2.50 octaves and can be set in 0.01 octave steps for PEQ (see EQ TYPE). The Q value is automatically displayed beneath the octave value. For LO-SHF or HI-SHF, it is either 6 or 12dB/Octave.



Cursor ▶ **LEVEL** – EQ level gain. The EQ level can be set from -30.00dB to +15.00dB in 0.25dB steps.

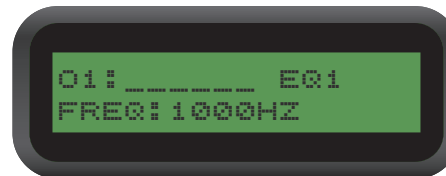


EQ Types Options for AP-1 and AP-2

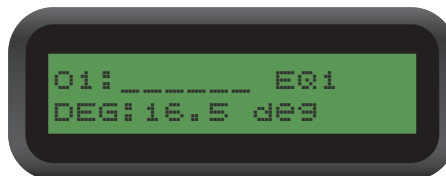
The all pass filters AP1, AP2 have two setting variables. One is a centre frequency, and the other is the amount of phase shift at that frequency.

Use the all pass filter to compensate for driver phase mismatch where you do not want to select the polarity reversal (180 degrees) across the entire frequency band, but only within a limited frequency band. For example if the frequency chosen is 1000hz, and the phase chosen is 30 degrees, then from 300hz to 1000hz the phase will change from 0 degrees to 30 degrees at 1000hz, changing back to 0 degrees at 3000hz.

Cursor ▶ **FREQ** – EQ center frequency; the equalizer's center frequency can be set anywhere within the range from 20 to 20,000Hz, in either 1Hz steps or 1/36 octave steps. The sampling rate and the frequency steps can be selected in the System Menu.



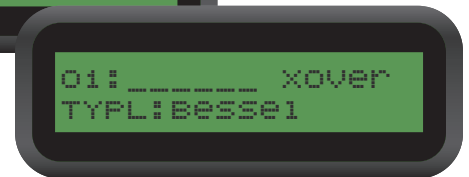
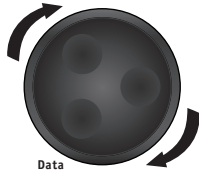
Cursor ▶ **DEG** – Set the Deg to compensate for driver phase mismatch.



3. CROSSOVER (XOver)

Crossover parameters can be set by pressing the ◀ **Cursor** push-button to advance from **TYPL** to **FRQL**, **SLPL**, **TYPH**, **FRQH** and finally to **SLPH**. (Use the ◀ **Cursor** push-button to go backward from **SLPH** to **FRQH**, **TYPH**, **SLPL**, **FRQL**, then to **TYPL**). Use the Data wheel to change the parameter's settings.

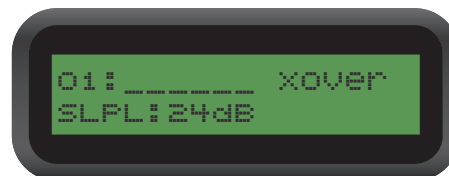
Menu ▶ TYPL – Filter Type of low frequency crossover point (high pass). Types can be Butterworth, Linkwitz-Riley or Bessel.

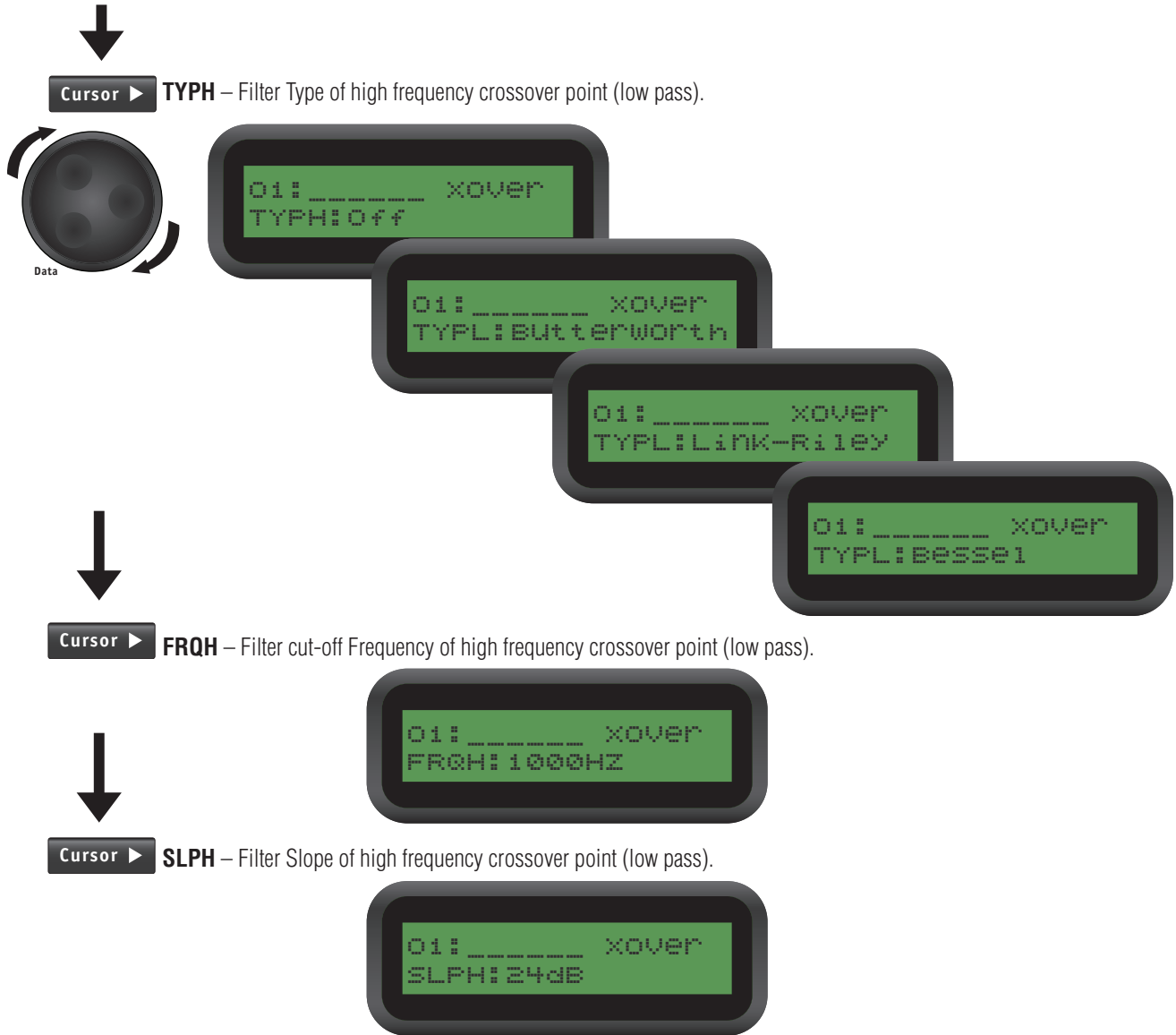


Cursor ▶ FRQL – Filter cut-off Frequency of low frequency crossover point (high pass). The cut-off frequency ranges from 20 to 20,000Hz in either 1 Hz steps or 1/36 octave steps. The frequency steps can be set in the System Menu.



Cursor ▶ SLPL – Filter Slope of low frequency crossover point (high pass). Ranges from 6 to 48 dB/octave. If the selected Filter Type is Linkwitz Riley, the available slopes are 6 / 12 / 24 / 36 / 48 dB/octave.





CROSSOVER FILTER CONFIGURATIONS

Configuration	Crossover Point		Graph
	Low	High	
None	Off	Off	
High Pass	TYPL (ON)	TYPH (OFF)	
Low Pass	TYPL (OFF)	TYPH (ON)	
Band Pass	TYPL (ON)	TYPH (ON)	

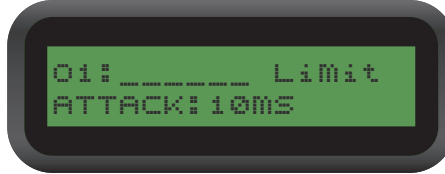
4. Limiter

Limiter parameters can be set by pressing the **Cursor ▶** push-button to advance from **THRESH** to **ATTACK** and finally to **RELEASE**. (Use the **◀ Cursor** push-button to go backward from **RELEASE** to **ATTACK** then to **THRESH**). Use the Data wheel to change the parameter's settings.

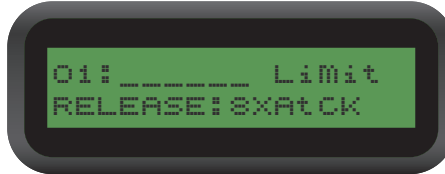
Menu ▶ THRESH – Limit Threshold. Ranges from -20 to +20dBu in 0.5dB steps.



Cursor ▶ ATTACK – Attack time. Ranges from 0.3 to 1ms in 0.1ms steps, then ranges from 1 to 100ms in 1 ms steps.



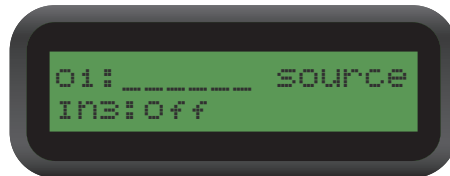
Cursor ▶ RELEASE – Release time. Can be set at 2X, 4X, 8X, 16X or 32X the attack time.



5. Source Menu

Use the Cursor push-buttons to select the Input channel for the current selected output channel. Use the Data wheel to change the Source parameter settings. The parameters can be set in 0.25 increments from 0.00 to -40.00; the Input can also be turned Off.

Cursor ▶ In1, In2, In3, In4 – The LCD displays the Input channel source for the current output channel. This feature can be used to mix the input source or disable it (Off). If more than one input sources are enabled, they will be summed together as the source for the current output channel.

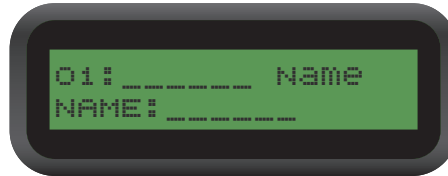


The example above shows sample settings for Output Channel 1. Input 1 has been set -14.00 units) relative to Input 2 which is at a nominal (0) setting. Inputs 3 and 4 are set to Off.

6. Name

All output channels can be named to help identify the channel or function. The output channel Name can be set by pressing the **Cursor ▶** push-button to advance to the next character. (Use the **◀ Cursor** push-button to go backwards). The Data wheel changes the individual characters.

Menu ▶ **NAME** – Channel name. 6 characters in length.



System Menus

The System menu allows system-level settings. This menu allows modifications to parameters that are related to system behavior and general operation of the **DLMS4080**. The System menu can be accessed by pressing the **Enter/Sys** key on the menu keypad (when no Input/Output or other System Menu is activated).

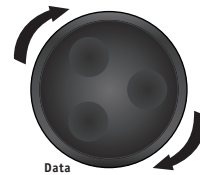


*Note: All System Menus require the **Enter/Sys** key to be pressed for the selected action to be activated.*

1. Recall Menu – Program memory bank recall

The **DLMS4080** has a built in non-volatile memory that can store up to 30 different program setups. A program previously saved to memory can be recalled using this menu.

Menu ▶ **PROG** – Program Number to be recalled. Use the Data Wheel to advance to the next program, press **Enter** twice to confirm selection.



2. Store Menu – Program memory bank

The **DLMS4080** has built-in non-volatile memory that can store up to 30 different program setups. The current programs settings can be stored using this menu. The old program with the same program number will be overwritten. Once the program is stored in the flash memory, it can be recalled at a later time, even after powering down or power failure.

Menu ▶ **PROG** – Program Number for the current data to be stored.

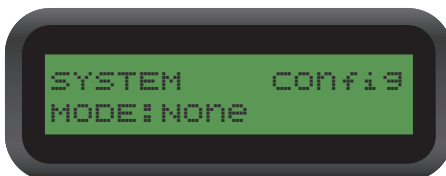


Cursor ▶ **NAM** – Program Name, allows a maximum length of 12 characters.



3. Config – Device Configuration

Menu ► **MODE** – configures the mode of operation.



SYSTEM MODE OF OPERATION

Mode	Out 1	Out 2	Out 3	Out 4	Out 5	Out 6	Out 7	Out 8
None	Any	Any	Any	Any	Any	Any	Any	Any
Stereo 2-Way	In1	In1	In2	In2	In1	Any	Any	Any
Stereo 3-Way	In1	In1	In1	In2	In2	In2	Any	Any
Stereo 4-Way	In1	In1	In1	In1	In2	In2	In2	In2

The **DLMS4080** assigns the Input source for the corresponding outputs when the Mode of Configuration is selected. The crossover point parameters like the filter type, cut-off frequency and slope have to be configured manually in the Xover Menu in each Output menu.



Note: The configuration mode configures the input sources when selected. The user can change the source afterwards if desired. It does not keep the configuration in memory.

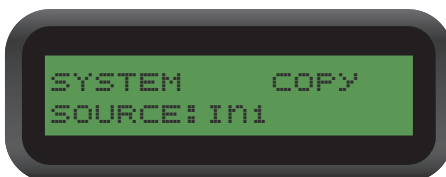
4. Copy – Copy channel parameters

With this menu you can copy parameters from one channel to another; all you need to do is select the source and the target channel. Press Enter/Sys to finalize the copy.



Note: When the source and target channels are both inputs all audio parameters will be copied (or if they are both outputs). When the source or the target are an input while the other is an output, only the Level, Polarity, Delay and EQ are copied.

Menu ► **SOURCE** – Use the data wheel to choose the channel to be copied, press the Enter/Sys.



Cursor ► **TARGET** – Use the data wheel to select the channel that the parameters will be applied to, press the Enter/Sys push-button to copy the parameters.

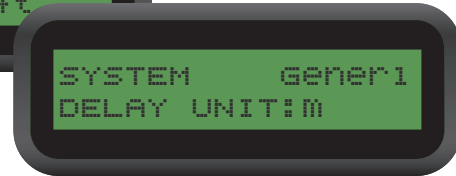
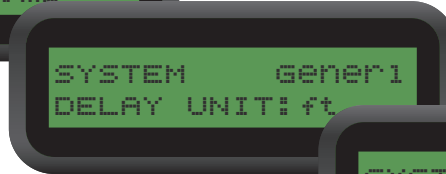
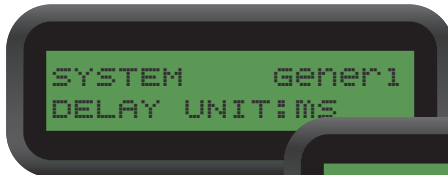
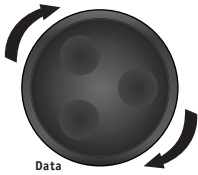


5. Generl – General system parameters

Menu ▶ **FREQ MODE** – Selects the frequency control mode for EQ and crossover filters. Can be 36 steps/octave or All Frequencies (1 Hz resolution).



Cursor ▶ **DELAY UNIT** – ms, ft or m.



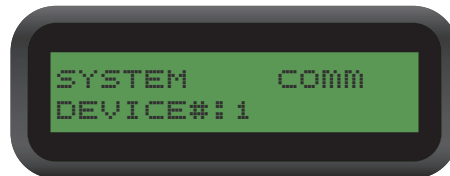
6. Comm – RS232 Serial Communication parameters

These parameters include baud rate and device identification when more than one **DLMS4080** is operating on the same network.

Menu ▶ **BAUD RATE** – Select the baud rate of the serial communication, choose between 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200.



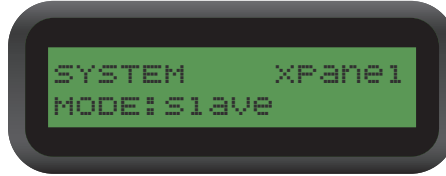
Cursor ▶ **DEVICE #** – Assigns the device ID from 1 to 16. This ID is useful when a network of more than 1 unit is present.



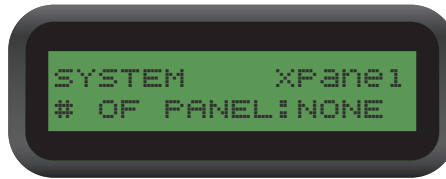
7. XPanel – Network Setup

If there are more than one **DLMS4080** on a network, units can be assigned as a Master or a Slave. This enables the Master unit to control units which are setup as slaves.

Menu ▶ **MODE** – The **DLMS4080** can be set as a Master or Slave.



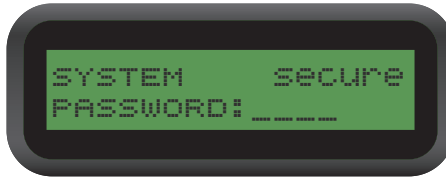
Cursor ▶ **# OF PANEL** – Identification numbers can be assigned to distinguish individual units on a network for remote setup using a computer. Identification can be set at None or a number from 1 - 63.



8. Security – Security Lock

The **DLMS4080** enables the user to secure the unit and prevent undesired changes in the setup. In order to lock/unlock the unit the user must enter the correct password.

Menu ▶ **PASSWORD** – The password of the **DLMS4080** is 4 characters in length. The user can change it via the PC application software. The factory default of a new unit does not require a password.



Setting Up an Ethernet Connection.

1. If you are not familiar with setting up a CAT-5 Ethernet connection, then we advise you to have a person familiar with this procedure set up your network.
2. The first step is to connect the Ethernet Switch to the computer and to the DLMS4080 with Ethernet straight-thru cables.
3. In Windows XP click on **start**, click on **run**, then execute the **cmd** command in the run window.
4. Type in the command **ipconfig**, and then press the **Enter** key.
5. Note the **IP address** and the **subnet mask**. Write these numbers down on a piece of paper.
6. For example if your computer's **IP address** is **169.254.168.107** and the **subnet mask** is **255.255.0.0**, for the two devices to communicate, an **IP address** in the same network group should exist in the DLMS4080. To access and change the **IP address** in the DLMS4080, with the unit powered up:
 - a. Press **Enter**
 - b. Press the **Menu >** button 6 times until the **Eth-IP** window is showing (show lcd screen).
 - c. Enter **169.254.** into the first 6 digits of the **IP address** in the DLMS4080. Use the **<Cursor>** buttons and the **Data** wheel to change the numbers.
 - d. Now enter the last 6 digits of the **IP address** but using a slightly different number. For example you could enter **168.108**. The full **IP number** in the DLMS would read **169.254.168.108**. Press **Enter**. To confirm, press **Enter** again.
7. Now start up the **VTC ProControl PC software** on your computer. Do not connect to the device when asked.
8. Select **Setup** on the top menu bar. **Select Port Connection**. For the connection type: **Select CAT-5 Ethernet**. Next, you need to know the DLMS4080 device number. To find it, go to the DLMS4080 and press **Enter/Sys**. Then press the **Menu>** button 5 times until the **Comm** screen appears. Now press the **Cursor>** button once. The **Device ID:** screen will appear. Note the number, for example **Device ID: 1**. now, back to the **ProControl software**. Select the **Device No.** (that you just found in the DLMS4080) into the Device selector. Check the box **Online** to confirm that this is required. Now enter the **IP address** that you entered into the DLMS4080. Following our example above, you would enter **169.254.168.108**. Press **O.K.** to close the window.
9. To check that the computer is communicating with the DLMS4080, go back to the DOS window that you opened using **ipconfig**. At the **DOS prompt** type in **ping** followed by the **IP number**. Our example from above would result in the command **ping 169.254.168.108**. If the computer is communicating with the DLMS 4080, you should see the results: **Packets: Sent= 4, Received= 4, Lost= 0**. This confirms that there was data sent to the DLMS4080, and data received in return. If you do not receive this result, then go back to step #3 and confirm the installation.
10. Start up the **VTC ProControl program**. When asked, **Do you want to connect to the device**, select **Yes**. After the start up window if the computer is communicating with the DLMS4080, you should see in the **Device List "Device 1 (connected)"**. Now the DLMS4080 VTC ProControl software can control the DLMS4080.

For more complex configurations such as multiple DLMS4080s please refer to the VTC website under <http://www.vtcproaudio.com/downloads>.

Setting Up a PC USB Connection

File downloads, uploads, and the control of the front panel can be accomplished through the DLMS4080 USB connector to a computer running the VTC ProControl under Windows XP.

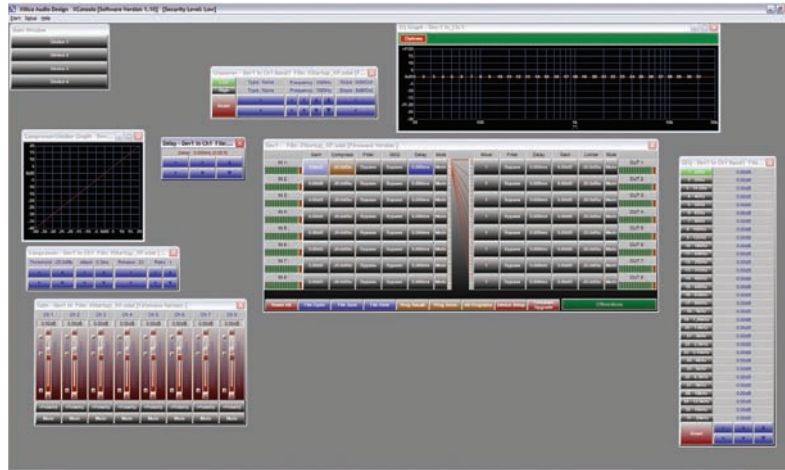
Installing the VTC ProControl application onto your personal computer will also install the USB driver required to set up the USB connection to the DLMS4080.

The following procedure will allow your personal computer to communicate to the DLMS4080:

1. Load the VTC ProControl software from the CD included with your DLMS4080 onto your computer.
2. When the VTC ProControl application installation is complete, connect a USB cable from the USB socket on the front panel of the DLMS4080 to a USB connector on your personal computer. (cable not included)
3. Turn on the DLMS4080.
4. Start up the ProControl application on your personal computer by double mouse clicking on the VTC ProControl ICON on your Desktop.
5. When you are asked "**Do you want to connect to the device**" answer "**yes.**"
6. You will note in the top left of your computer's screen that the software will state "**Device 1-(Not Connected)**" which is fine for now.
7. Mouse click on **Setup** located on the top menu bar and open **Port Connection**.
8. Change the connection **Type** to **Serial Port / USB**.
9. Leave the **Device No.** set to **1**.
10. Mouse click on the **Online** box so that a appears in the box.
11. Now is the trial and error process for selecting the **COM Port**. Mouse click on the expand arrow located on the right side of the **COM Port** box. Scroll down to find which port numbers are available. Select the first available com port.
12. Mouse click on **OK**.
13. The program will ask you to restart the VTC ProControl application for the connection to take effect. Mouse click on **OK**.
14. Close the VTC ProControl application by selecting with your mouse the red X located in the top right hand corner of the VTC ProControl Window.
15. Now start up the VTC ProControl application from your personal computer's desktop.
16. When you are asked "**Do you want to connect to the device**" answer "**yes**".
17. Observe the Device 1 box on the top left corner of your computer's screen. If it says "**(Connected)**" the installation is complete. If it says "**(Not Connected)**", repeat steps 11 to 15 selecting the next available com port in the scroll down list. Eventually you will select the port that's connected to the DLMS4080.

VTC ProControl Software (Windows XP) PC Control Software

The DLMS4080 is shipped with a special visual processor control (Windows XP) PC Graphic User Interface (GUI) application - VTC ProControl Software. The VTC ProControl application gives the user the option to control the unit from a remote Windows XP PC through the USB, RS-232 or Ethernet communication links. The VTC ProControl GUI application makes it much easier to control (and monitor) the DLMS4080, allowing the user to get the whole picture on one screen. Programs can be recalled and stored from/to PC's hard drive, thus expanding the storage to become virtually limitless.

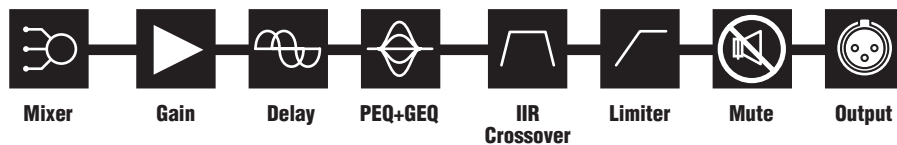


Line Array EL210, ELS212

The software loaded into the VTC DSP processor is optimized for the EL210 in the 2-way mode, and for the EL210 and ELS212 in the 3-way mode. Minor frequency response equalization and system gain adjustments for array configurations, and venue acoustics should only occur in the processor input section.

Parameter Values

Attempting to change any of the channel output settings could damage the loudspeaker drivers.



The output limiter settings provide a compromise between the maximum allowable acoustic output and minimal loudspeaker driver failures. These settings will reduce the possibility of damage to the loudspeaker drivers, but will not eliminate failures if driven excessively hard.



Additional loudspeaker driver protection is achieved by reducing the limiter threshold level in the input section of the processor.

Using Generic Processors

Yorkville strongly recommends that you do not use your favorite processor settings when programming a processor for the Elevation Line Array. To properly program a Digital Signal Processor for use with the Elevation Line Array, please refer to the VTC website under <http://www.vtcproaudio.com/downloads> for the audio parameter setting values. These values will assist you in providing the best performance and protection for the loudspeaker drivers.

Entering the values from the table into other manufacturer's processors may not provide the expected frequency response and protection that the Elevation Line Array was designed to because of differences in the digital processor's program. If a DSP processor other than the VTC DLMS4080 is used, contact the VTC product support group for the specific settings for your processor.

Amplifier Gain

The power amplifier's gain is a very important value that will affect the Elevation's performance and protection. If you are using the VTC recommended amplifiers for the intended DLMS 4080 program, then the amplifier gain controls should be set to maximum gain. If amplifiers other than those recommended by VTC are used, then the DSP processor's (whether it be the DLMS4080 or a generic model) output channel gain and protection limiter settings must change. Please contact the VTC product support group for the specific gain settings for your model of amplifier.

Warning: Do not adjust the gain controls of your amplifiers to a setting other than that specified by VTC. Doing so may damage the loudspeaker drivers.

QUICK REFERENCE

Parameters	Menu <<Menu>>	Field <<Cursor>>	Min	Max	Steps	Units
Level	Signal	LEVEL	-40	+15	0.25	dB
Polarity	Signal	POL	+ / -			
Delay	Signal	DELAY	0	9,600	1	21user steps
EQ Number	EQ	EQ#	1	8	1	
EQ Level	EQ	LEVEL	-30	+15	0.25	dB
EQ Frequency	EQ	FREQ	20	20,000	1	Hz
EQ Bandwidth	EQ	BW	0.02	2.50	0.01	Octave
Crossover Low	XOver	TYPL	Off / Butterworth / Linkwitz-Riley / Bessel			
Crossover Low	XOver	FRQL	20	20,000	1	Hz
Crossover Low	XOver	SLPL	6	48	6	dB/Octave
Crossover High	XOver	TYPH	Off / Butterworth / Linkwitz-Riley / Bessel			
Crossover High	XOver	FRQH	20	20,000	1	Hz
Crossover High	XOver	SLPH	6	48	6	dB/Octave
Out Limit Thresh	Limit	TRESH	-20	+20	0.5	dBu
Out Attack Time	Limit	ATTACK	0.3	100	0.1/1	ms
Out Release Time	Limit	RELEASE	2 / 4 / 8 / 16 / 32X Attack Time			
Source	Source	1, 2, 3	Off / On (0.00 to -40.00 in 0.25 increments)			
Channel Name	Ch-Name	NAME	6 Characters			

AMPLIFIER SETTINGS

Suggested Amplifier Arrangement for Elevation Line Array									
Cabinets	Configuration	Power Handling	Impedance						
EL210 HF	2 x 1-inch Paraline Lens	160	8 Ohms						
EL210 MF	2 x 10-inch Woofers	1200	8 Ohms						
EL212 Sub	2 x 12-inch Tapped Horn	1600	4 Ohms						
System 1 - 4 x EL210 / 2 x ELS212				AmplifierType	Amplifiers	Cabinets	Impedance	Req'd Power	Delivered Power
EL210 (4)	EL210 - HF	AP2020 (4ohm Mode)		1	2 per side	4	640	900	
	EL210 - MF	AP4020 (bridged)		2	2 per amp	4	4800	4800	
EL212 (2)	ELS212 - Subwoofer	AP6040		1	1 per side	4	3200	4000	
Total								9700	
System 2 - 8 x EL210 / 4 x ELS212				AmplifierType	Amplifiers	Cabinets	Impedance	Req'd Power	Delivered Power
EL210 (8)	EL210 - HF	AP2020 (4ohm Mode)		2	2 per side	4	1280	1800	
	EL210 - MF	AP4020 (bridged)		4	2 per amp	4	9600	9600	
EL212 (4)	ELS212 - Subwoofer	AP6040		2	1 per side	4	6400	8000	
Total								19400	
System 3 - 12 x EL210 / 6 x ELS212				AmplifierType	Amplifiers	Cabinets	Impedance	Req'd Power	Delivered Power
EL210 (12)	EL210 - HF	AP2020 (4ohm Mode)		3	2 per side	4	1920	2400	
	EL210 - MF	AP4020 (bridged)		6	2 per amp	4	14400	14400	
EL212 (6)	ELS212 - Subwoofer	AP6040		3	1 per side	4	9600	12000	
Total								28800	
System 4 - 16 x EL210 / 8 x ELS212				AmplifierType	Amplifiers	Cabinets	Impedance	Req'd Power	Delivered Power
EL210 (16)	EL210 - HF	AP2020 (4ohm Mode)		4	2 per side	4	2560	3600	
	EL210 - MF	AP4020 (bridged)		8	2 per amp	4	19200	19200	
EL212 (8)	ELS212 - Subwoofer	AP6040		4	1 per side	4	12800	16000	
Total								38800	

Specifications

Type Digital Speaker Processor

Input and Outputs

Input Impedance >10k ohms
Output Impedance 50 ohms
Maximum Input/Output Level +20 dBu
Input/Output Type Electronically balanced

Audio Performance

Frequency Response +/- 0.1dB (20Hz - 20kHz)
Dynamic Range 115dB typ (unweighted)
CMMR >60dB (50Hz - 10kHz)
Crosstalk <-100dB
Distortion 0.002% (1kHz @ +4dBu)

Front Panel Controls

Display 2x16 character backlit LCD
Level Meters 5-segment LED
Buttons Mute/Edit Controls / Menu Controls
Dial Encoder Embedded thumbwheel

Connectors

Audio Connectors 3-pin XLR
USB Type B
RS-232 DB-9
Ethernet RJ-45
Power Standard IEC connector

Audio Control Parameters

Gain -40dB to +15dB in 0.25dB steps
Polarity +/-
Delay Up to 650ms per Input / Output

Parametric Equalizers (8 per Input/Output)

Type Parametric, Hi-Shelf, Lo-Shelf
Gain -30dB to +15dB in 0.25dB steps
Bandwidth 0.02 to 2.50 octaves (Q=0.5 to 72)

Crossover Filters (2 per Input / Output)

Filter Types Butterworth, Bessel, Linkwitz-Riley
Slopes 6 to 48 dB/Octave

Input Limiters

Threshold -20 to +20dBu
Attack 0.3 to 100ms
Release 2 to 32X the attack time
Ratio 1:1 to 40:1

Output Limiters

Threshold -20 to +20dBu
Attack 0.3 to 100ms
Release 2 to 32X the attack time

Limiters

Threshold -20 to +20dBu
Attack 0.3 to 100ms
Release 2 to 32X the attack time

System Parameters

Number of Programs 30
Program Names 12 character length
Delay Units ms, ft, m
Frequency Modes 36 steps/octave, 1Hz resolution
Security Lock Lock/Unlock
Copy Channels All parameters
Channel Names 6 character length

General

Power 90-240VAC (50/60Hz)
Dimensions 19-inch x 1.75-inch x 9-inch (48.5 cm x 4.5 cm x 23 cm)
Weight (lbs / kg) 7 / 3.2

Two Year Warranty

Limited Warranty

Yorkville's two-year conditional warranty on this product is transferable and does not require registration with Yorkville Sound or your dealer. If this product should fail within two years of the original purchase date due to a manufacturing defect, simply return it to your Yorkville Dealer with original proof of purchase and it will be repaired free of charge.

Freight charges, consequential damages, weather damage, damage as a result of improper installation, damages due to exposure to extreme humidity, accident or natural disaster are excluded under the terms of this warranty. See your Yorkville dealer for more details. Warranty valid only in Canada and the United States

Garantie Limitée

La protection qu'offre cette garantie limitée de deux ans est transférable. Il n'est pas nécessaire de faire enregistrer votre nom. Si durant les deux années qui suivent la date d'achat originale, un problème causé par un défaut de fabrication survient, nous ferons la réparation de l'appareil gratuitement. Retournez simplement l'appareil défectueux à votre vendeur autorisé avec la preuve d'achat originale et l'appareil sera réparé gratuitement. Les frais de port et de manutention ainsi que les dommages indirects ou dommages causés par désastres naturels, extrême humidité ou mauvaise installation ne sont pas couverts par cette garantie. Voir votre marchand Yorkville pour plus de détails. Cette garantie n'est valide qu'au Canada et aux États Unis d'Amérique.

Canada U.S.A.

Voice: (905) 837-8481 Voice: (716) 297-2920
Fax: (905) 837-8746 Fax: (716) 297-3689

Yorkville Sound
550 Granite Court
Pickering, Ontario
L1W-3Y8 CANADA

Yorkville Sound Inc.
4625 Witmer Industrial Estate
Niagara Falls, New York
14305 USA

www.vtcproaudio.com

VTC
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