

MOD-HDTV



**ISTRUZIONI PER L'USO - OPERATING INSTRUCTIONS
MODE D'EMPLOI**

1. I: AVVERTENZE PER LA SICUREZZA

L'installazione del prodotto deve essere eseguita da personale qualificato in conformità alle leggi e normative locali sulla sicurezza.

IMPORTANTE: Non togliere mai il coperchio dell'alimentatore, parti a tensione pericolosa possono risultare accessibili all'apertura dell'involucro. Solo personale addestrato e autorizzato può intervenire sul prodotto, con lo scopo di effettuare le regolazioni descritte in queste istruzioni. In caso di guasto non tentate di ripararlo altrimenti la garanzia non sarà più valida.

Avvertenze per l'installazione

- Utilizzare esclusivamente il cavo di rete in dotazione, installando il prodotto in modo che la spina di alimentazione sia facilmente accessibile.
- Il prodotto non deve essere esposto a gocciolamento o a spruzzi d'acqua e va pertanto installato in un ambiente asciutto, all'interno di edifici.
- Non installare il prodotto sopra o vicino a fonti di calore o in luoghi polverosi o dove potrebbe venire a contatto con sostanze corrosive.
- Lasciare spazio sufficiente attorno al prodotto per garantire un'adeguata ventilazione. L'eccessiva temperatura di lavoro e/o un eccessivo riscaldamento possono compromettere il funzionamento e la durata del prodotto.
- In caso di montaggio a muro utilizzare tasselli ad espansione adeguati alle caratteristiche del supporto di fissaggio.

In accordo con la direttiva europea 2004/108/EC (EMC), il prodotto deve essere installato utilizzando dispositivi, cavi e accessori che consentano di rispettare i requisiti imposti da tale direttiva per le installazioni fisse.

Messa a terra dell'impianto d'antenna

Il prodotto deve essere collegato all'elettrodo di terra dell'impianto d'antenna conformemente alla norma EN60728-11.

La vite predisposta a tale scopo è contrassegnata con il simbolo . Si raccomanda di attenersi alle disposizioni della norma EN60728-11. Il prodotto è di Classe II, secondo la norma EN 60065, e per tale ragione **non deve essere mai collegato alla terra di protezione** della rete di alimentazione (PE – Protective Earthing).

1. GB: SAFETY WARNINGS

The product must be installed only by qualified persons, according to the local safety standards and regulations.

IMPORTANT: Never remove the power supply cover, parts at hazardous voltage could be accessible when the product case is opened. Only instructed and authorized persons can operate the product, in order to carry out the adjustments described on these instructions. In case of failure, do not try to repair it otherwise the guarantee will no longer be valid.

Installation warnings

- Use only the original power cable, installing the product so that the mains plug is easily accessible.
- The product must not be exposed to dripping or splashing and thus it shall be installed indoors, in a dry place.
- Don't install the product above or close to heat sources, in dusty places or where it might come into contact with corrosive substances.
- Leave enough space around the product housing to ensure adequate ventilation. An excessive operating temperature and/or an excessive heating may affect the performance and the life of the product.
- For product wall mounting use expansion fixings suitable with the fixing support features.

In accordance with the European Directive 2004/108/EC (EMC), the product shall be installed using devices, cables and accessories that allow to comply with this directive requirements for fixed installations.

Earthing of the antenna system

The product must be connected to the earth electrode of the antenna system, in accordance with standard EN60728-11.

The screw to be used for this scope is marked with the symbol . It is recommended to follow the provisions of EN60728-11. It is classified as Class II, in accordance with EN 60065 and, for this reason, **it shall not be connect to the protective earth** (PE) of the supply mains.

1. F: AVERTISSEMENT DE SÉCURITÉ

F: L'installation du produit doit être effectuée par du personnel qualifié conformément aux lois et aux normes locales sur la sécurité.

IMPORTANT : Ne jamais enlever le couvercle de l'alimentation, des parties sous tension dangereuse peuvent être accessibles lors de l'ouverture de l'enveloppe. Seul du personnel qualifié et autorisé peut effectuer des opérations sur les circuits internes du produit. En cas de pannes, ne pas chercher à le réparer, sinon la garantie ne sera plus valable.

Avertissements pour l'installation

- Utiliser exclusivement le câble de réseau fourni et installer le produit de façon à ce que la fiche d'alimentation soit facilement accessible.
- Le produit ne doit pas être exposé à l'égouttement ou aux éclaboussures d'eau et doit donc être installé dans un endroit sec, à l'intérieur de bâtiments.
- Ne pas installer le produit sur ou près des sources de chaleur, dans des endroits très poussiéreux ou en contact avec des substances corrosives.
- Laisser de l'espace autour du produit suffisant pour garantir une ventilation adéquate. La température excessive et/ou le chauffage excessif peuvent compromettre le fonctionnement et la durée de vie du produit.
- En cas de montage mural, utiliser des chevilles expansibles adéquates aux caractéristiques du support de fixation.

Conformément à la directive européenne 2004/108/EC (EMC) le produit doit être installé en utilisant les dispositifs, les câbles et les connecteurs conformes aux indications de la directive pour les installations fixes indiquée ci-dessus.

Mise à la terre de l'installation de l'antenne

Le produit doit être connecté à l'électrode de terre de l'installation de l'antenne en conformité avec la norme EN60728-11.

La vis prévue à cet effet est indiquée avec le symbole .

Il est conseillé de suivre les indications de la norme EN60728-11.

Le produit est de Classe II, conformément à la norme EN 60065, c'est pour cette raison qu'**il ne doit jamais être connecté à la mise à la terre de protection** du réseau d'alimentation (PE – Protective Earthing).

2. DESCRIZIONE DEL PRODOTTO

Il MOD-HDTV è un modulatore DVB-T che permette di rimodulare una sorgente HDMI o RCA su un canale Digitale terrestre nella banda VHF (E5-E12) o nella banda UHF (E21-E69). La qualità delle immagini e la qualità di modulazione rende il MOD-HDTV la soluzione ideale per la distribuzione di segnali HD o RCA Banda Base, provenienti da esempio un lettore DVD, STB o telecamera in una rete CATV utilizzando la tecnologia DVB-T. L'utente ha la possibilità di programmare il dispositivo tramite Display e tastierino a bordo; per una programmazione più avanzata è possibile collegare il modulatore al PC via USB ed utilizzare il software scaricabile dalla sezione prodotti del sito web www.fracarro.it

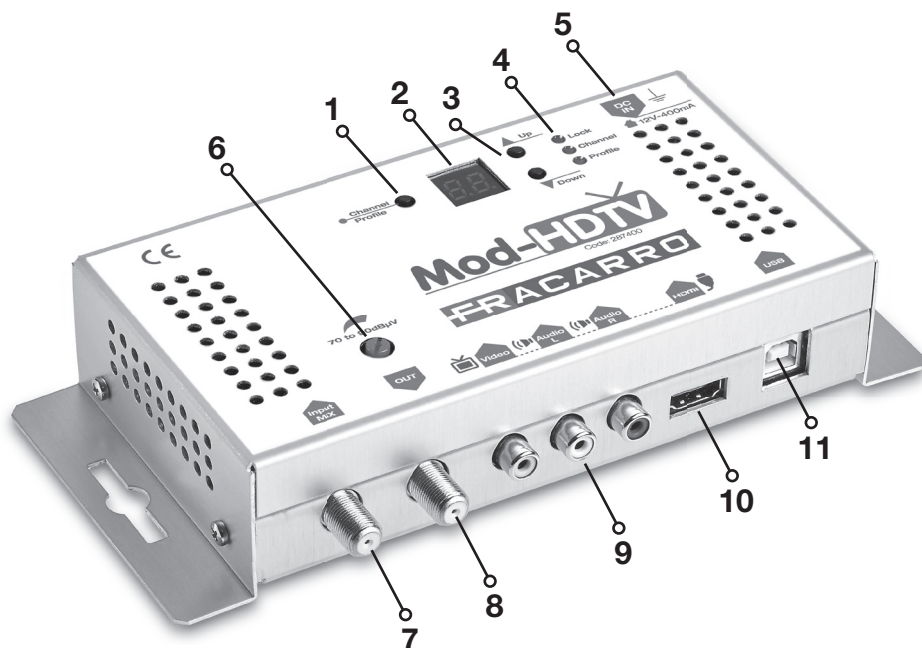


Fig. 1

1. Tasto "Chanel mode"
2. Display a Sette Segmenti
3. Pulsanti su e giù
4. LED indicazione
5. Connettore Alimentazione 12VDC/400mA
6. Trimmer Regolazione Livello Uscita
7. Connettore RF Ingresso MIX
8. Connettore RF Uscita
9. Ingressi RCA
10. Ingresso HDMI
11. Porta USB

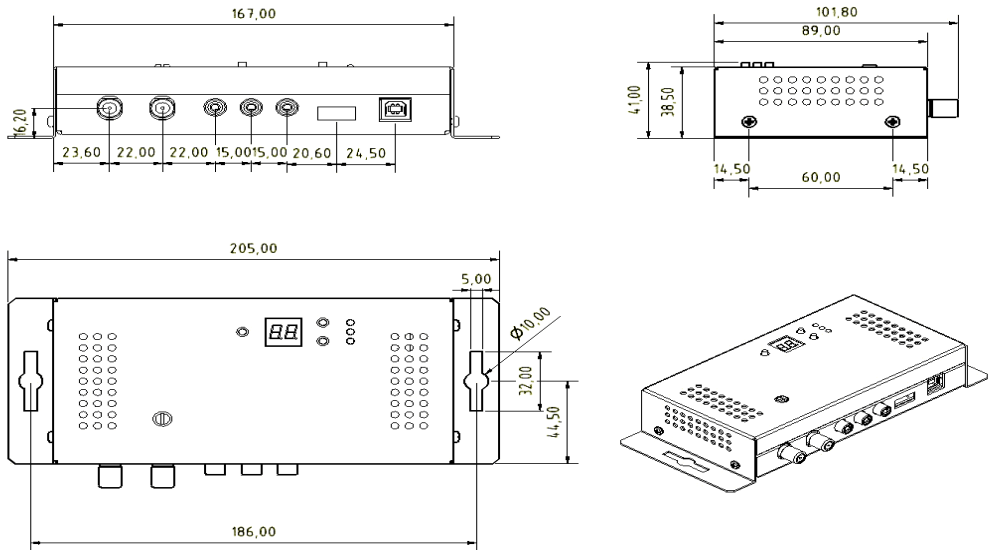


Fig. 2

3. INSTALLAZIONE DEL PRODOTTO

Collegare il modulatore alla rete elettrica tramite l'apposito alimentatore fornito in dotazione. Collegare la sorgente Audio/Video desiderata (DVD, STB, DVR) ai relativi ingressi, utilizzando un cavo HDMI in caso di sorgente HD o tramite un collegamento RCA in caso di sorgente analogica. Infine collegare all'uscita OUT il cavo per la distribuzione TV (Vedi Fig.1).

Antenna TV

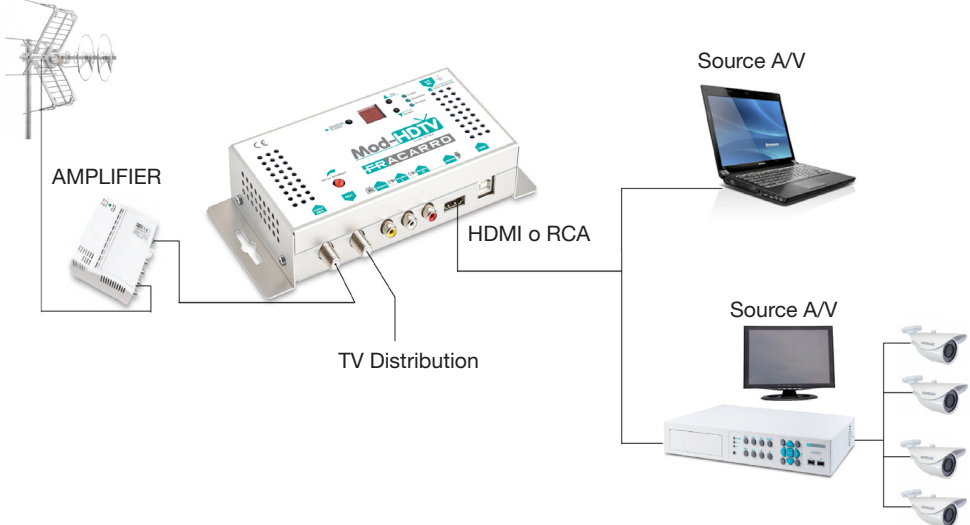


Fig. 3 Collegamento standard

Funzioni auto-reset e watchdog.

Durante il normale funzionamento, la CPU principale contenuta nel MOD-HDTV controlla tutte le componenti in modo da garantirne il corretto funzionamento. In caso di anomalie o di guasto interno, il MOD-HDTV avvia automaticamente la procedura di recupero, reimpostando il modulo, riavviandolo e cercando di ripristinare il normale funzionamento.

Protezione da Accessi non Autorizzati.

Al fine di evitare accessi indesiderati, trascorso un minuto di inattività, il MOD-HDTV attiva automaticamente la modalità "blocco tastiera". I due puntini rossi accesi sul display indicano che la tastiera a bordo è bloccata. Per sbloccare la tastiera ed accedere alla programmazione, l'utente dovrà tener premuto contemporaneamente i tasti SU + GIÙ ' per 5 secondi. (Fig.4).

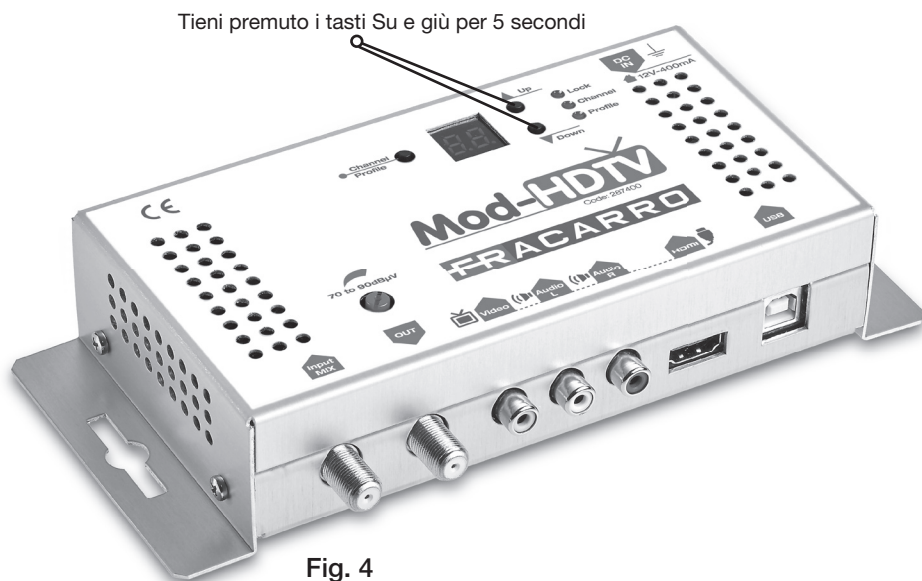


Fig. 4

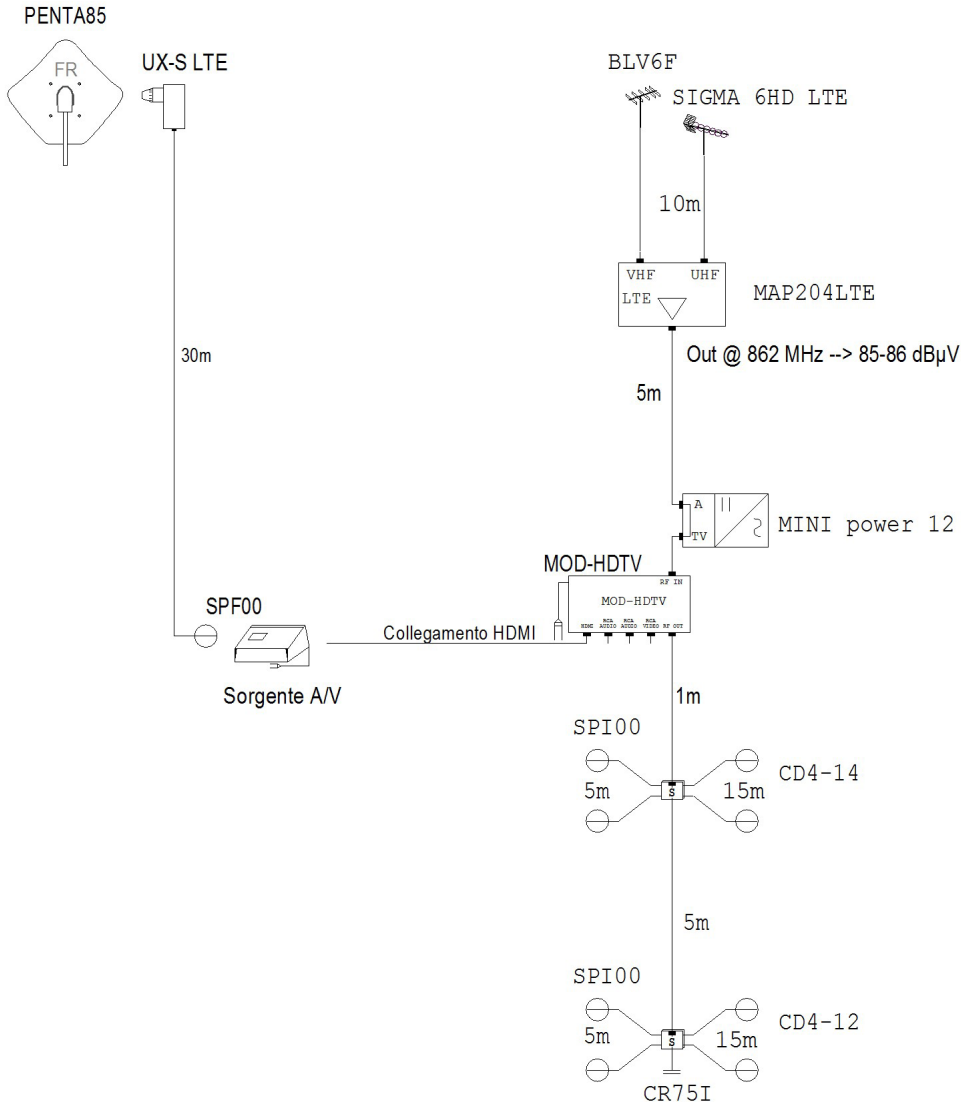
Rilevazione automatica della sorgente di ingresso.

Il modulatore MOD-HDTV rileva automaticamente una sorgente Audio/Video valida collegata all'ingresso HDMI; questa sorgente sarà contrassegnata come sorgente primaria o principale. Se la sorgente primaria dovesse guastarsi o venisse scollegata, il modulatore commuta automaticamente sulla sorgente secondaria (Ingressi RCA).

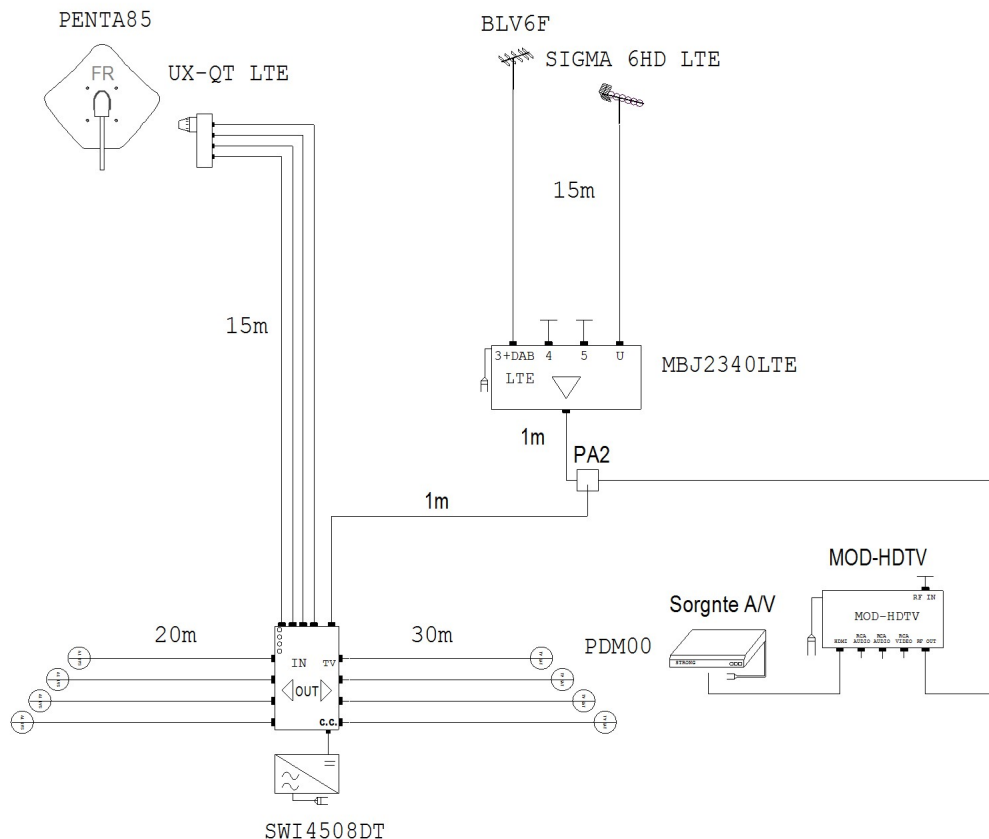
Interfaccia USB per la programmazione avanzata.

Il MOD-HDTV dispone di un'interfaccia USB con un apposito software per la programmazione avanzata. Per maggiori informazioni vedi pag xx.

4. ESEMPI DI CONFIGURAZIONE



Esempio 1



Esempio 2

5. ISTRUZIONI PER LA PROGRAMMAZIONE

Il MOD-HDTV può essere programmato in modi:

- Tramite il display e i tasti a bordo del modulatore;
- Tramite l'interfaccia USB, con l'apposito Software;

Programmazione tramite display e tasti a bordo.

Il modulatore MOD-HDTV può essere programmato mediante questi 4 semplici passaggi riportati di seguito:

1° Step

Accendere il MOD-HDTV collegandolo all'opportuno alimentatore esterno (12VDC/1A). Il modulatore avrà bisogno di circa 20-30 secondi per avviarsi ed il display a sette segmenti mostrerà l'avanzamento della procedura di inizializzazione.

2° Step

Trascorso il tempo di inizializzazione, il modulatore MOD-HDTV entrerà in modalità **"Channel mode"** ed il led **"Channel"** si accenderà. Premendo il pulsante **"Channel/Profile"** l'utente sarà in grado di commutare tra la modalità **"Channel"** o **"Profile"**. Impostare il canale RF di uscita desiderato all'interno dei canali VHF E05... E12 e UHF E21...E69 utilizzando i pulsanti **"Su/Giù"**. Attendere circa 10 secondi per l'aggancio del PLL.

3° Step

Regolare il livello del segnale RF di uscita desiderato all'interno del range 70dBµV – 90dBµV utilizzando l'apposito trimmer frontale da 20dB.

4° Step

Se sono presenti più modulatori MOD-HDTV collegati allo stesso impianto di distribuzione è possibile utilizzare la modalità **“Profile mode”**. Selezionando questa modalità, ad ogni modulatore verrà associato un profilo diverso in modo da evitare conflitti durante la sintonizzazione dei TV.

Funzione Profile mode:

Se vengono collegati più modulatori MOD-HDTV nello stesso impianto, i parametri sottoriportati devono assumere valori diversi al fine di evitare anomalie nella scansione automatica dei televisori:

Program Name	Service ID	TS ID
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Per questo motivo, l'utente deve selezionare un diverso numero di profilo per ogni modulatore, **Profilo N° 1** per il primo modulatore, **Profilo N° 2** per il secondo modulatore, ... **Profilo N° 10** per il decimo modulatore, ecc. ecc....

Se ad esempio si decide di installare tre modulatori nella stessa distribuzione coassiale, nel 4° Step si dovranno effettuare le seguenti impostazioni:

Profilo 1 associato al primo modulatore che significa che saranno impostati i seguenti parametri:

- **Program Name = DTV 1**
- **Service ID = 1**
- **TS ID = 2240**

Profilo 2 associato al secondo modulatore; saranno impostati i seguenti parametri:

- **Program Name = DTV 2**
- **Service ID = 2**
- **TS ID = 2241**

Profilo 3 per il terzo modulatore; saranno impostati i seguenti parametri:

- **Program Name = DTV 3**
- **Service ID = 3**
- **TS ID = 2242**

Come risultato, tutti i modulatori avranno valori differenti nei campi suddetti, Ogni volta che si sceglie un diverso Profilo il MOD-HDTV effettuerà un riavvio completo che durerà circa 20-30 secondi.

Utilizzando l'interfaccia USB con il Software, si ha la possibilità di personalizzare i campi qui sopra indicati.

Programmazione tramite Software.

E' possibile effettuare la programmazione avanzata del MOD-HDTV (tramite collegamento con il PC via USB) utilizzando il software e i driver scaricabili dalla sezione prodotti del sito web www.fracarro.it

Requisiti di sistema:

- **Windows XP (SP1 o superiore)**
- **Windows Vista**
- **Windows 7 (32 e 64bit)**
- **Windows 8 (32 e 64bit)**

Connessione del dispositivo tramite il software

- 1-Scaricare il software dal sito www.fracarro.it nella sezione Download.
- 2-Estrarre dal file compresso la cartella "FR software MOD-HDTV".
- 3-Collegare il MOD-HDTV al PC tramite il cavo USB (tipo A- maschio B-maschio).
- 4-Attendere qualche minuto per l'installazione automatica dei driver.
- 5-Nel caso in cui i driver USB non vengono installati automaticamente, Windows vi chiederà di installare manualmente i driver, inserire il corretto percorso della cartella denominata "USB Drivers", che contengono i driver del MOD-HDTV.
- 6-Una volta che Windows ha installato con successo i driver USB, viene visualizzato un messaggio pop-up che conferma che l'installazione è stata eseguita correttamente
- 7-Eseguire il File "FRACARRO GUI 2v0" e si aprirà la schermata principale (vedi Fig.5)

Fig.5

Guida al Software

- 1-Dal Menu a tenda "ComPort" selezionare la porta USB corretta che collega il MOD-HDTV al PC e premere "Connetti".

The screenshot shows the FRACARRO GUI 2v0 interface. The 'ComPort' dropdown is set to 'COM4' and is circled in red. The 'Status' field is empty, and the 'Notes Board' is also empty. The 'DVB-T Settings', 'Encoder Settings', 'Multiplexer Settings', and 'System' sections are visible, each with 'Get' and 'Apply' buttons. A 'Get All Parameters' button is at the bottom center. The status bar at the bottom left indicates 'Not Connected'.

2-Una volta connesso correttamente, verranno scaricate automaticamente tutte le impostazioni presenti sul MOD-HDTV.

The screenshot shows the FRACARRO GUI 2v0 interface after a successful connection. The 'ComPort' dropdown is still set to 'COM4'. The 'Status' field now displays 'Status'. The 'DVB-T Settings' section shows: Channel 40, MHz 626, Bandwidth 8MHz, Constellation QAM-64, Modulation 8k, Guard Interval 1/32, Code Rate 7/8, Gain 0. The 'Encoder Settings' section shows: Input Source Auto, Video BR (Mbps) 18500, Audio BR (kbps). The 'Multiplexer Settings' section shows: Name Fracarro, ID 8720, Network FR_HD, Program 1, Provider Fracarro, Original NET ID 8720, TS ID 2210, PMT PID 500, Video PID 501, Audio PID 502, LCN 123, LCN Provider EICTA/Europe. The 'System' section shows: Status, FW Version, SW Version, LOT Number. The 'Notes Board' is empty. The 'Get All Parameters' button is at the bottom center. The status bar at the bottom left indicates 'Not Connected'.

3-II Software “FRACARRO GUI 2v0” dispone di quattro sottocategorie come descritto in seguito:

- **DVB-T Settings** - parametri che riguardano le impostazioni del modulatore.
- **Encoder Settings** - parametri relativi alla codifica H.264.
- **Multiplexer Settings** - parametri riguardanti il Multiplexer digitale.
- **System Settings** - parametri di informazione del sistema.

DVB-T Settings

In questo menu l'utente è in grado di impostare i vari parametri riguardante il segnale RF d'uscita del modulatore, come descritto di seguito:

- **Channel** - selezione del canale di uscita (VHF: 5-12 o UHF: 21-69).
- **Bandwidth** - selezione della Larghezza di banda (VHF : 7MHz - UHF: 8MHz).
- **Constellation** - selezione della Costellazione (QPSK, QAM-16, QAM-64).
- **Modulation** - selezione del numero della portanti (2K, 4K, 8K).
- **Guard Interval** - selezione dell'intervallo di guardia (1/4, 1/8, 1/16, 1/32).
- **Code rate** - selezione delle Code rate (1/2, 2/3, 3/4, 5/6, 7/8).

Encoder Settings

In questo menu l'utente è in grado di regolare i parametri del codificatore H.264, come descritto di seguito:

- **Input source** - selezione della sorgente d'ingresso primaria (HDMI o RCA).
- **Video BR (Mbps)** - Impostazioni del bitrate video.
- **Audio BR (Kbps)** - Impostazioni del bitrate audio.

Multiplexer Settings

In questo menu l'utente è in grado di regolare i parametri del multiplexer digitale , come descritto di seguito:

- **Network Name + ID** - Impostazione del nome del Multiplex e numero
- **Program Name + ID** - Impostazione del nome che appare sul banner del STB/TV
- **Provider Name** - Impostazioni del nome Provider
- **Original Net ID** - Impostazione del Net ID
- **TS ID (*)** - Impostazione del TS ID
- **PMT PID** - Impostazioni del valore PMT PID
- **Video PID** - Impostazioni del valore PID Video
- **Audio PID** - Impostazioni del valore PID Audio
- **LCN (1-999)** - impostazione del numero dell'LCN e attivazione e disattivazione.
- **LCN Provider** - Impostazioni paese dell'LCN.

(*) **N.B.:** Se su l'impianto sono presenti più modulatori MOD-HDTV, assicurarsi che i valori di **TS ID** siano sempre differenti fra loro, onde evitare conflitti nella ricerca dei programmi.

ATTENZIONE: Le impostazioni relative alla modulazione devono essere impostate con cura in modo da avere un adeguato bitrate di uscita. Il bitrate di uscita (che può essere calcolato dalle tabelle A-B vedi pag. xx) deve essere uguale o inferiore alla somma totale del bitrate Video e Audio.

Esempio: Supponendo di selezionare le seguenti impostazioni di modulazione:

Modulazione: 8K
 Costellazione: 16-QAM
 Codice Voto: 5/6
 Intervallo di guardia: 1/32
 Larghezza di banda: 8MHz

Avremo un bitrate di uscita pari a 20.107 Mbps (vedi tabella A ,B, e C Pag.xx).
 Questo significa che il bitrate del modulatore nel menu **Encoder Settings** deve essere regolato in modo tale che il bitrate totale non superi il limite 20.107Mbps, altrimenti potrebbero verificarsi effetti di squadrettamento.

System Settings

Questo menu visualizza le informazioni relative allo stato del modulatore:

- **Status** - indica lo stato del modulatore.
- **FW Version** - indica la versione del firmware.
- **SW Version** - indica la versione software.
- **HW Version** - indica la versione hardware MOD-HDTV.
- **Serial number** - indica il numero di serie del dispositivo.

Pulsanti

GET: Premendo il tasto “Get” in qualsiasi sub-categoria, tutte le impostazioni di questa categoria verranno acquisite dal modulatore e riportate nel software.

APPLY: Premendo il pulsante “Apply” in qualsiasi sub-categoria, tutte le impostazioni della relativa categoria verranno inviate al modulatore.

FACTORY DEFAULTS: Il pulsante “Factory Defaults” ripristina le impostazioni di fabbrica del modulatore.

RESET SYSTEM: Il pulsante “Reset System” esegue un reset del modulatore.

The screenshot displays the FRACARRO MOD-HDTV software interface. On the left, there is a vertical 'FRACARRO' logo. The main area is divided into several panels:

- ComPort:** Shows 'COM4' selected with 'Connect' and 'Disconnect' buttons.
- DVB-T Settings:** Includes fields for Channel (40), MHz (626), Bandwidth (8MHz), Constellation (QAM-64), Modulation (8k), Guard Interval (1/32), Code Rate (7/8), and Gain (0). It has 'Get' and 'Apply' buttons at the bottom.
- Encoder Settings:** Includes 'Input Source' (Auto), Video BR (18500), and Audio BR (kbps). It has 'Get' and 'Apply' buttons at the bottom.
- Multiplexer Settings:** Includes fields for Name, ID, Network, Program, Provider, Original NET ID, TS ID, PMT PID, Video PID, Audio PID, LCN, and LCN Provider. It has 'Get' and 'Apply' buttons at the bottom.
- System:** Includes fields for Status, FW Version, SW Version, and LOT Number. It has 'Get' and 'Apply' buttons at the bottom.
- Notes Board:** A large empty text area.

At the bottom of the interface, there is a 'Get All Parameters' button and a 'Reset System' button (circled in red). Other buttons like 'Factory Defaults' and 'SW Update' are also visible in the bottom right corner.

2. PRODUCT DESCRIPTION

The MOD-HDTV is a DVB-T digital stand-alone modulator, which allows you to encode and remux an HDMI or RCA source on a digital terrestrial channel in the VHF band (E5-E12) or UHF (E21-E69) band. The excellent specs (Full HD 1920*1080-30p) and modulation quality (MER~35dB) renders the MOD-HDTV the ideal solution for distributing HD or analog TV signals coming from e.g. a Audio/Video player, laptop or CCTV camera in a domestic coax network using the DVB-T technology. The user can setup the device via display and keypad on board; for the advanced setup, it's possible to connect the digital modulator to the PC via USB and use the software and the drivers available for download from the product section of the website www.fracarro.com

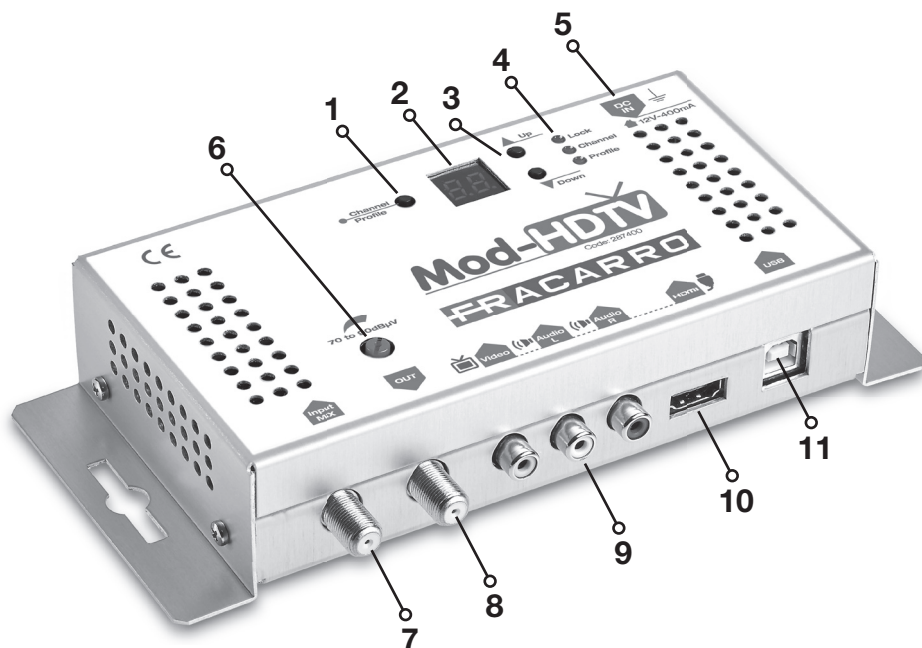


Fig. 1

1. Button "Chanel mode"
2. Seven Segment Display
3. Up and down buttons
4. LED indication
5. connector Power 12V / 400mA
6. RF Output Level trimmer adjustment
7. RF connector input MIX
8. RF output connector
9. RCA input
10. HDMI input
11. USB input

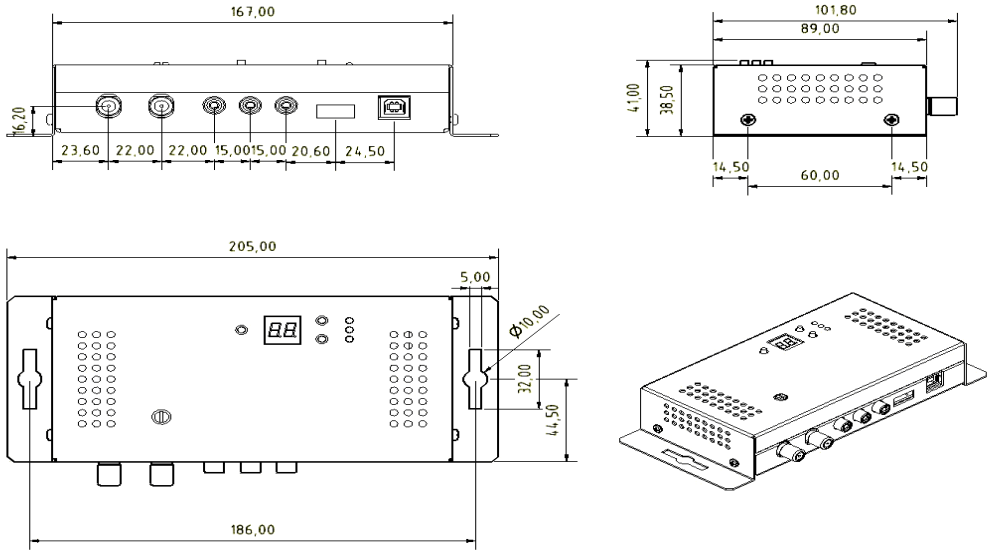


Fig. 2

3. PRODUCT INSTALLATION

Connect the power supply included to the MOD-HDTV modulator. Connect the external Audio/Video sources (DVD, STB, DVR) to the modulator by using the HDMI cable (in case of HD input source) or by using RCA cable (in case of Analogue input source). Connect the RF OUT connector to the coax distribution.

Antenna TV

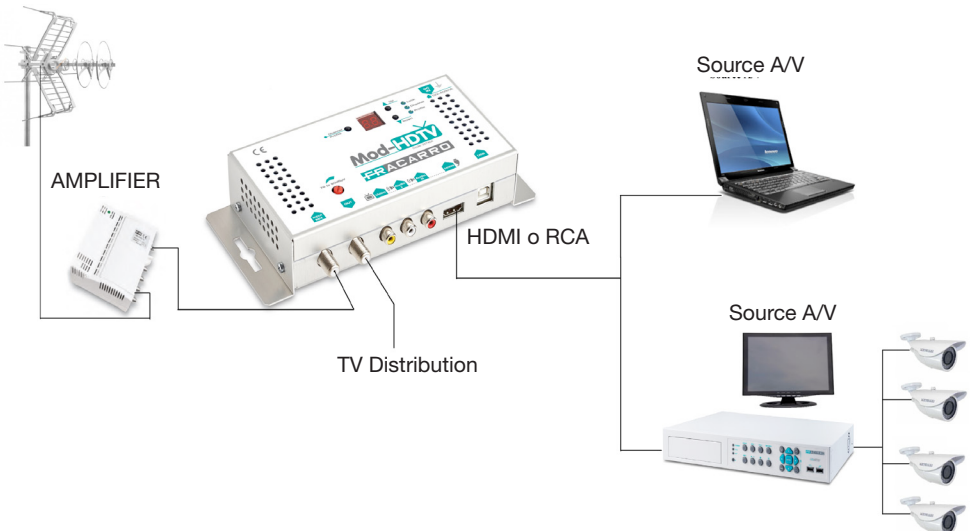


Fig. 3 Standard connection

Auto reset and watchdog functions.

During normal operation, the main CPU of MOD-HDTV checks all the parameters in order to ensure correct device functionality. In case of internal fault, the MOD-HDTV run immediately the recovery procedure by resetting the module and restarting it again. Finally, a watchdog timer ensures that the device will be restored in case of errors of the CPU.

Protection from Unauthorized Access.

The MOD-HDTV block the functionality of its keys after one minute idle time in order to prevent unwanted settings. Two red dots on the display notify to the installer that the on-board buttons are locked. To unlock them, it must simultaneously press the UP+DOWN for 5 seconds. (Fig.4).

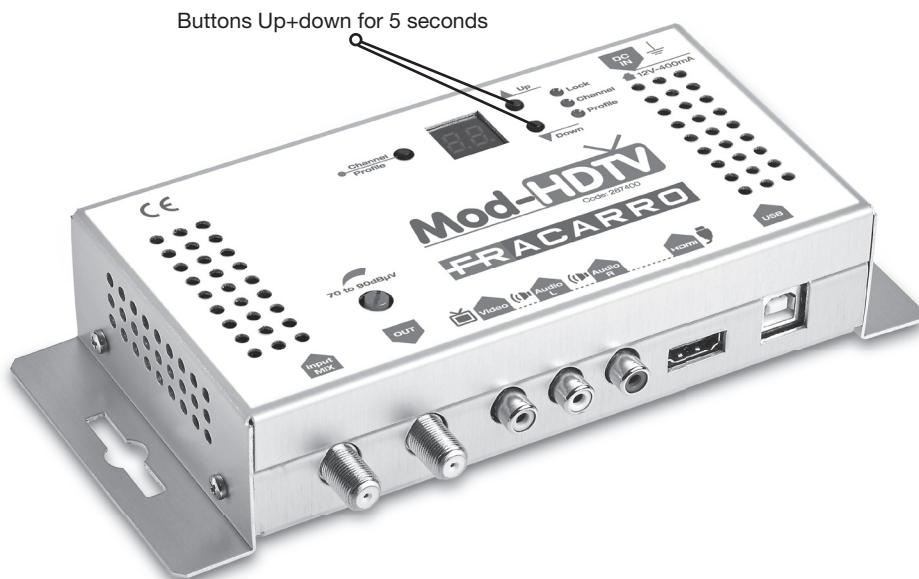


Fig. 4

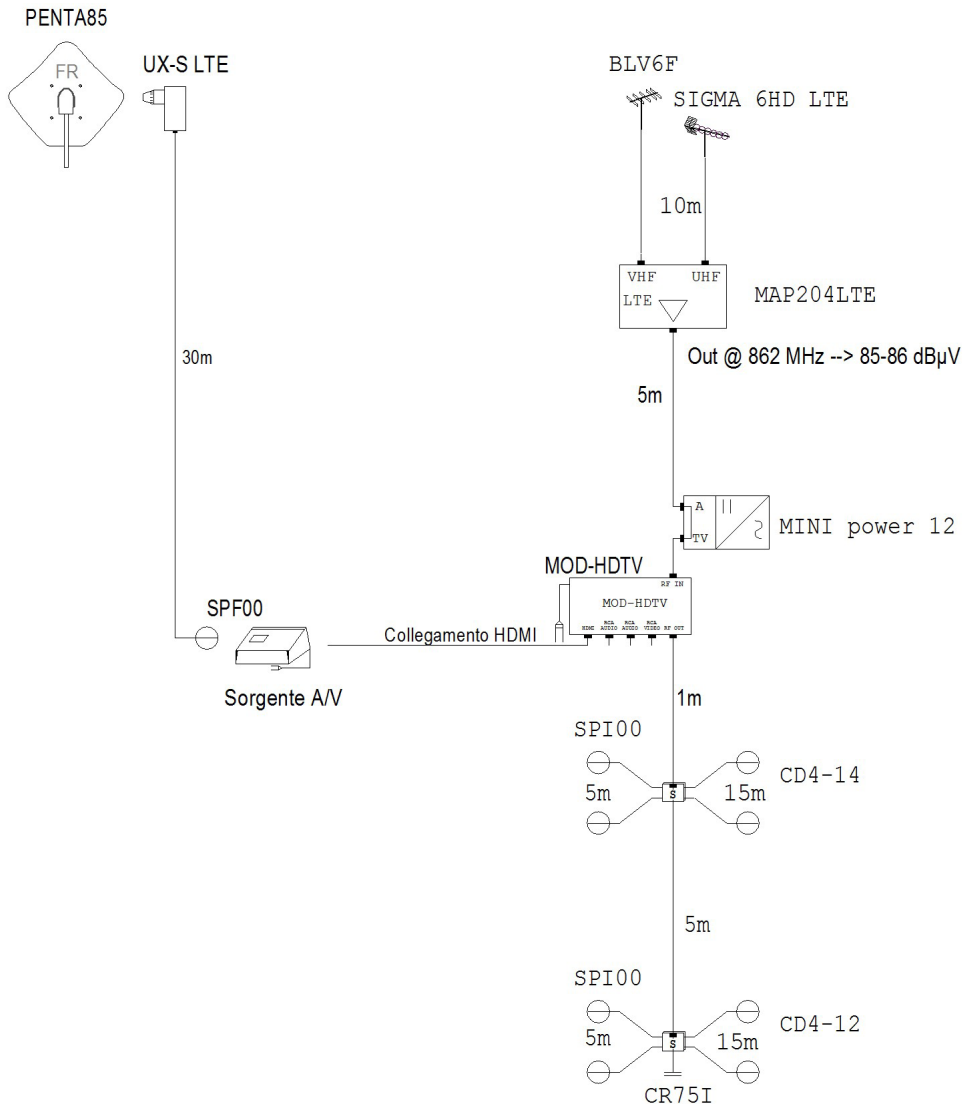
Automatic Input source detect

When the MOD-HDTV detects a correct input source, for example a source connected to the HDMI input, it will “mark” this source as a primary source. In case of failure of the primary source, the modulator automatically switches to the secondary source (i.e. RCA input).

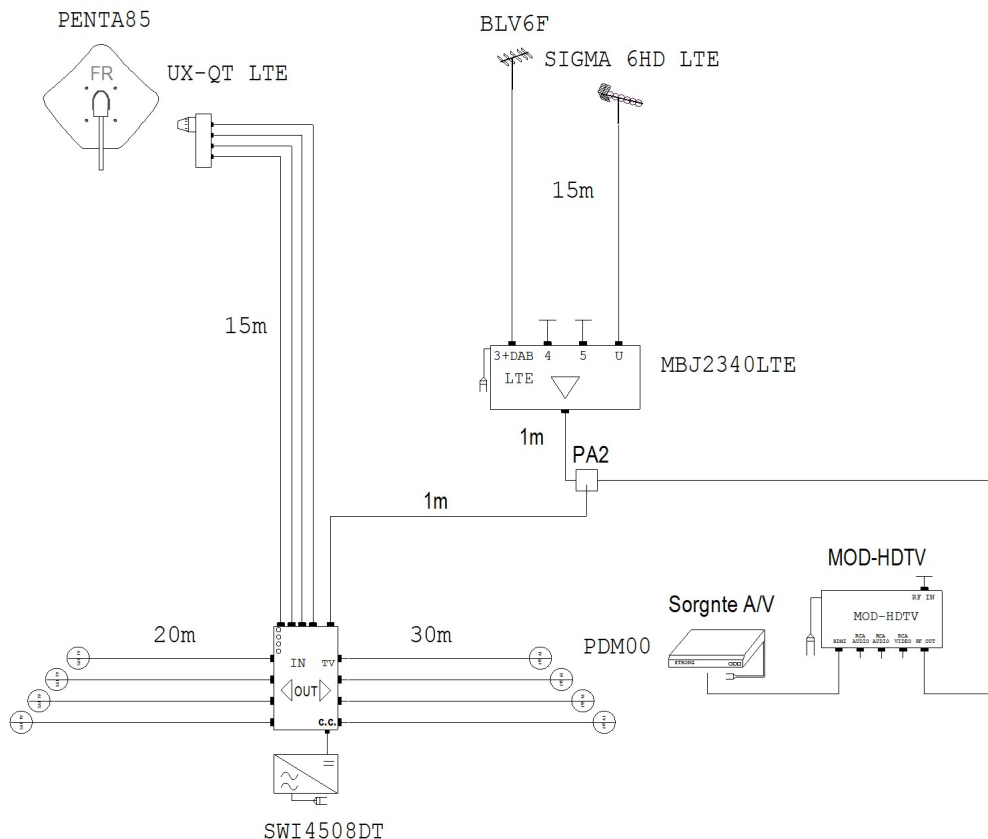
USB interface for advanced settings

The MOD-HDTV is equipped with a USB interface that allow the PC connection in order to perform the advanced settings via software. For more information see page xx.

4. CONFIGURATION EXAMPLES



Example n° 1



Example n° 2

5. PROGRAMMING INSTRUCTIONS

The MOD-HDTV can be programmed in two different ways:

- With display and keys on board the modulator;
- With USB interface, with the appropriate software

Programming via display and buttons on board.

The modulator MOD-HDTV can be programmed using these 4 simple steps using the following procedure:

First Step

Turn on the MOD-HDTV by connecting the appropriate external power supply (12VDC / 1A). The modulator will need about 20-30 seconds to start up and the seven-segment display will show the progress of the initialization procedure.

Second Step

After the initialization time, the modulator MOD-HDTV will go to "Channel mode" and the LED "Channel" will be on. Pressing the "Channel / Profile" you will be able to switch between the "Channel" or "Profile". Set the desired output RF channel within the channels VHF and UHF E05 ... E12 E21 E69 ... using the "Up / Down". Wait about 10 seconds for the PLL.

Third Step

Adjust the level of the RF signal output using the appropriate front trimmer by 20dB in a level in the range 70dBμV - 90dBμV.

Fourth Step

If there are multiple modulators MOD-HDTV connected to the same distribution system you can use the mode "Profile mode". Selecting this mode each modulator is associated a different profile to avoid conflicts when tuning TV.

Profile function mode:

To prevent conflicts during the automatic scanning of TV receivers it's mandatory to set different values on the following fields:

Program Name	Service ID	TS ID
--------------	------------	-------

For this reason, the user must always select a different profile for each modulator, connected on the same coaxial distribution, Profile No 1 for the first modulator, Profile No 2 for the second modulator, ... Profile No 10 for the tenth modulator, etc. etc. ...

For example, if we need to install three modulators in a same TV distribution, the profile that should be select will be:

Profile 1 for the first modulator which means that it will be set to the following parameters:

- **Program Name = DTV 1**
- **Service ID = 1**
- **TS ID = 2240**

Profile 2 for the second modulator, you will set the following parameters:

- **Program Name = DTV 2**
- **Service ID = 2**
- **TS ID = 2241**

Profile 3 for the third modulator, you will set the following parameters:

- **Program Name = DTV 3**
- **Service ID = 3**
- **TS ID = 2242**

As a result, all modulators will have different values in the fields above, each time you choose a different number Profile MOD-HDTV a full reset that will last about 20-30 seconds.

Using the USB interface with the software, you have the ability to customize the fields mentioned above.

Software guidelines

It is possible to perform the advanced settings of MOD-HDTV modulator through the USB connection to the PC and by using the software. The software and the drivers are available for download on the product section of the www.fracarro.it website.

System requirements

- **Windows XP (SP1 o superiore)**
- **Windows Vista**
- **Windows 7 (32 e 64bit)**
- **Windows 8 (32 e 64bit)**

MOD-HDTV advanced settings via software

- 1- Download the software from www.fracarro.com Download section.
- 2- Unzip the “software MOD FR-HDTV software” file folder.
- 3- Connect the MOD-HDTV to your PC via the USB cable (Type A-male/B-male).
- 4- Wait a few minutes for the automatic driver's installation procedure.
- 5- If the USB drivers are not automatically installed, Windows will ask you to manually install the USB drivers; during the manual installation refer to the “USB Drivers” folder.
- 6- Once Windows has successfully installed the USB drivers, you see a pop-up message that indicate that the installation was successfully done.
- 7- Run the file “FRACARRO GUI 2V0” software. Below you will see the main screen (see Figure 5)

The screenshot shows the FRACARRO GUI 2V0 software interface. On the left, there is a vertical 'FRACARRO' logo. The main window is titled 'MOD-HDTV' and has a menu bar with 'MOD-HDTV' and 'About'. Below the menu bar, there are several sections:

- ComPort:** A dropdown menu for selecting a port, with 'Connect' and 'Disconnect' buttons.
- DVB-T Settings:** Includes fields for Channel, MHz, Bandwidth, Constellation, Modulation, Guard Interval, Code Rate, and Gain, with 'Get' and 'Apply' buttons.
- Encoder Settings:** Includes fields for Input Source, Video BR (Mbps), and Audio BR (kbps), with 'Get' and 'Apply' buttons.
- Multiplexer Settings:** Includes fields for Name (Up to 16 Characters), ID (1 ~ 65535), Network, Program, Provider, Original NET ID (1 ~ 65535), TS ID (1 ~ 65535), PMT PID (31 ~ 8100), Video PID (31 ~ 8100), Audio PID (31 ~ 8100), LCN (1 ~ 999), and LCN Provider, with 'Get' and 'Apply' buttons.
- System:** Includes fields for Status, FW Version, SW Version, and LOT Number, with a 'Get' button.
- Notes Board:** A large text area for notes.

At the bottom left, it says 'Not Connected'. At the bottom right, there are buttons for 'SW Update', 'Factory Defaults', and 'Reset System'. A 'Get All Parameters' button is located at the bottom center.

Fig.5

Guide to Software

- 1-From the “ComPort” menu select the correct USB port that connects the MOD-HDTV and confirm with “Connect”.

ComPort: COM4

MOD-HDTV | About

DVB-T Settings

Channel: MHz:

Bandwidth:

Constellation:

Modulation:

Guard Interval:

Code Rate:

Gain:

Encoder Settings

Input Source:

Video BR (Mbps):

Audio BR (kbps):

Multiplexer Settings

Name (Up to 16 Characters): ID (1 ~ 65535):

Network:

Program:

Provider:

Original NET ID: (1 ~ 65535)

TS ID: (1 ~ 65535)

PMT PID (31 ~ 8100): Video PID (31 ~ 8100): Audio PID (31 ~ 8100):

LCN (1 ~ 999): LCN Provider:

System

Status:

FW Version:

SW Version:

LOT Number:

Notes Board

Get All Parameters

Not Connected

2-Once properly connected, all settings are automatically downloaded from MOD-HDTV modulator.

ComPort: COM4

MOD-HDTV | About

DVB-T Settings

Channel: 40 MHz: 626

Bandwidth: 8MHz

Constellation: QAM-64

Modulation: 8k

Guard Interval: 1/32

Code Rate: 7/8

Gain: 0

Encoder Settings

Input Source: Auto

Video BR (Mbps): 18500

Audio BR (kbps):

Multiplexer Settings

Name (Up to 16 Characters): Fracarro ID (1 ~ 65535): 8720

Network: Fracarro

Program: FR_HD

Provider: Fracarro

Original NET ID: 8720 (1 ~ 65535)

TS ID: 2210 (1 ~ 65535)

PMT PID (31 ~ 8100): 500 Video PID (31 ~ 8100): 501 Audio PID (31 ~ 8100): 502

LCN (1 ~ 999): 123 Enable LCN Provider: EICTA/Europe

System

Status:

FW Version:

SW Version:

LOT Number:

Notes Board

Get All Parameters

3- The Software “FRACARRO GUI 2V0” is composed by four different subcategories as described below:

- **DVB-T Settings** – Output modulation parameters settings menu
- **Encoder Settings** – H.264 encoder parameters settings menu
- **Multiplexer Settings** – Multiplex settings menu
- **System Settings** – System information menu

The screenshot displays the FRACARRO MOD-HDTV software interface. At the top, four red arrows point to the titles of the main settings panels: 'DVB-T Settings', 'Encoder Settings', 'Multiplexer Settings', and 'System Settings'. Each panel is enclosed in a red rectangular box. The 'DVB-T Settings' panel includes fields for Channel (40), MHz (626), Bandwidth (8MHz), Constellation (QAM-64), Modulation (8k), Guard Interval (1/32), Code Rate (7/8), and Gain (0). The 'Encoder Settings' panel includes Input Source (Auto), Video BR (18500), and Audio BR. The 'Multiplexer Settings' panel includes Network (Fracarro), Program (FR_HD), Provider (Fracarro), Original NET ID (8720), TS ID (2210), PMT PID (500), Video PID (501), Audio PID (502), LCN No (123), and LCN Provider (EICTA Europe). The 'System Settings' panel includes Status, FW Version, SW Version, and LOT Number. A 'Notes Board' is located on the right side. At the bottom, there are 'Get' and 'Apply' buttons for each panel, and a 'Get All Parameters' button spanning all panels. A vertical 'FRACARRO' logo is on the left side of the interface.

DVB-T Settings

Through this section the user is able to adjust several parameters of the modulator RF output part, as described below:

- **Channel** - Output channel selection (VHF:5-12 & UHF:21-69).
- **Bandwidth** - Bandwidth selection (VHF : 7MHz - UHF: 8MHz).
- **Constellation** - Constellation selection (QPSK, QAM-16, QAM-64).
- **Modulation** - Modulation selection (2K, 4K, 8K).
- **Guard Interval** - Guard Interval selection (1/4, 1/8, 1/16, 1/32).
- **Code rate** - Code rate selection (1/2, 2/3, 3/4, 5/6, 7/8).

Encoder Settings

In this section the user is able to adjust the H.264 encoder parameters, as described below:

- **Input source** - Select the primary input source
- **Video BR (Mbps)** - Set the video bitrate
- **Audio BR (Kbps)** - Set the audio bitrate

Multiplexer Settings

In this section the user is able to adjust the MOD-HDTV multiplexer's parameters, as described below:

- **Network Name** – Enter the Network name
- **Program Name** – Enter the Program name
- **Provider Name** - Enter the Provider name
- **Original Net ID** - Set the Net ID (0-65535)
- **TS ID (*)** - Set the Transport Stream ID (0-65535)
- **PMT PID** – Set the PID value
- **Video PID** – Set the Video PID value
- **Audio PID** – Set the Audio PID value
- **LCN No** – Set the LCN No (1-999) (must be enabled first)
- **LCN Provider** - Set the LCN provider

(*) **NOTE:** If in the coaxial network are connected many MOD-HDTV modulators, the TS ID must be different from each other in order to avoid conflicts between them.

WARNING: The output modulation settings must be set carefully in order to have an appropriate output bitrate available. The output bitrate, which can be calculated using the tables AB on the pages. Xx, must be equal to or less than the sum total of the video and audio bitrate.

Example: Assuming we select the following modulation settings:

Modulation: 8K
Constellation: 16-QAM
Code Rate: 5/6
Guard Interval: 1/32
Bandwidth: 8MHz

We have an output bitrate of 20.107 Mbps (see table a, b, c, pag. xx).
 This means that the output bitrate (Encoder Settings menu) must be carefully adjusted so that the total bit rate does not exceed the limit 20.107MBps, otherwise artifacts may occur.

System Settings

This section contain some information about the system's settings as follows:

- **Status** - status of the modulator (Idle or Running)
- **FW Version** - firmware version of the uP
- **SW Version** - software version
- **HW Version** - hardware version of the MOD-HDTV.
- **Serial number** - serial number of the device

Buttons

GET: By pressing the “Get” button in any sub-category, all the settings of this category are downloaded from the modulator.

APPLY: By pressing the “Apply” button in any sub-category, all the settings of this category are uploaded to the modulator.

FACTORY DEFAULTS: The “Factory Defaults” button sets the modulator's setting to factory default.**RESET SYSTEM:** The “Reset System” button applies a reset to the modulator.

The screenshot displays the FRACARRO MOD-HDTV web interface. On the left, there's a 'ComPort' section with a dropdown menu showing 'COM4' and buttons for 'Connect' and 'Disconnect'. Below this is a large vertical 'FRACARRO' logo. The main area is divided into several panels:

- DVB-T Settings:** Includes fields for Channel (40), MHz (626), Bandwidth (8MHz), Constellation (QAM-64), Modulation (8k), Guard Interval (1/32), Code Rate (7/8), and Gain (0). It has 'Get' and 'Apply' buttons at the bottom.
- Encoder Settings:** Includes Input Source (Auto), Video BR (Mbps) (18500), and Audio BR (kbps). It also has 'Get' and 'Apply' buttons.
- Multiplexer Settings:** Includes Name (Fracarro), ID (8720), Network (FR_HD), Program (Fracarro), Provider (Fracarro), Original NET ID (8720), TS ID (2210), PMT PID (500), Video PID (501), Audio PID (502), LCN (123), LCN Provider (EICTA/Europe), and LCN Provider (Enable). It has 'Get' and 'Apply' buttons.
- System:** Includes Status, FW Version, SW Version, and LOT Number. It has a 'Get' button.
- Notes Board:** A large empty text area.

At the bottom of the interface, there are three buttons: 'Get All Parameters', 'Factory Defaults', and 'Reset System'. The 'Factory Defaults' and 'Reset System' buttons are circled in red.

2. PRODUCT DESCRIPTION

Le MOD-HDTV est un modulateur DVB-T, qui permet de moduler une source HDMI ou analogique en bande de base sur un canal numérique terrestre dans la bande VHF (E5-E12) ou dans la bande UHF (E21-E69). La qualité des images et la qualité de modulation font du MOD-HDTV la solution idéale pour la distribution des signaux HD ou analogiques en bande de base, provenant par exemple de lecteurs DVD, récepteurs numériques ou caméras analogiques, dans un réseau coaxial en standard DVB-T. Le produit peut être programmé par les touches et l'afficheur en façade ou, pour la programmation avancée, à travers d'un PC à l'aide d'un logiciel dédié téléchargeable du site web www.fracarro.com

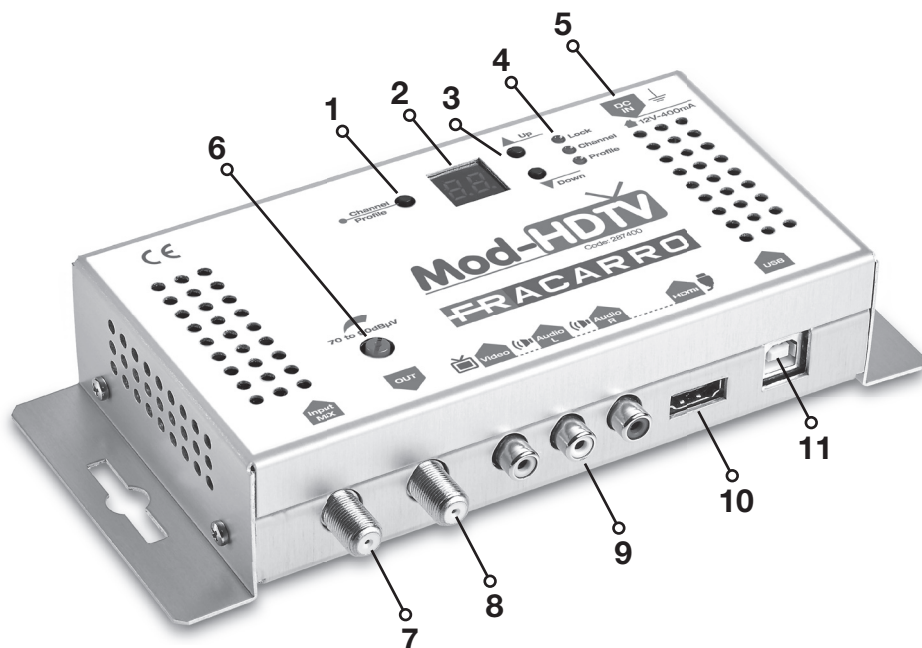


Fig. 1

1. Touche "Channel mode"
2. Afficheur
3. Touches UP/DOWN
4. LED indication mode
5. Connecteur Alimentation 12V/400mA
6. Réglage du niveau de sortie
7. Connecteur RF entrée couplage antenne
8. Connecteur RF de sortie
9. Entrée analogique RCA
10. Entrée HDMI
11. Port USB

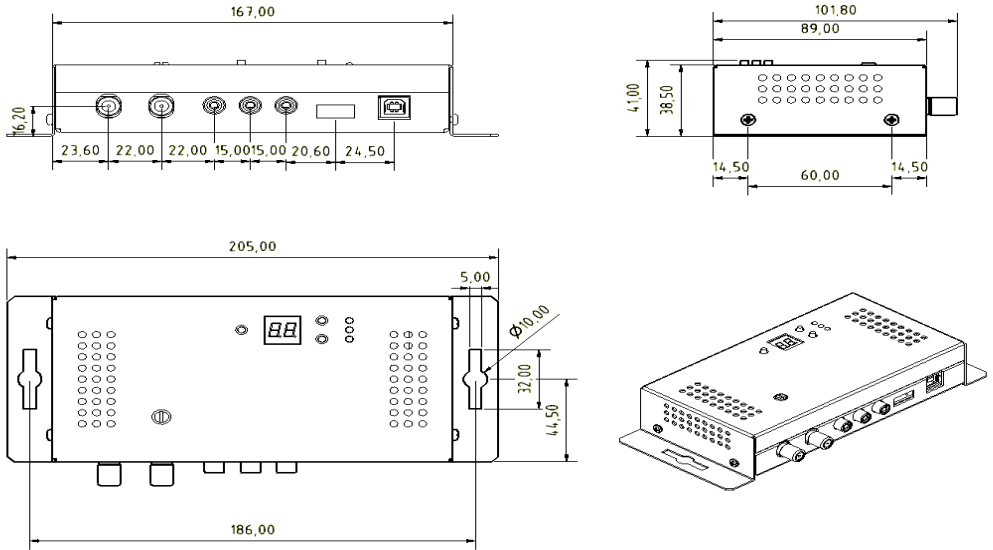


Fig. 2

3. INSTALLATION DU PRODUIT

Branchez l'alimentation fournie au secteur et au modulateur, puis branchez la source audio/vidéo à l'entrée correspondante (HDMI ou RCA). Branchez le signal d'antenne à l'entrée INPUT MIX et le câble de la distribution au connecteur OUT (Fig.1).

Antenna TV

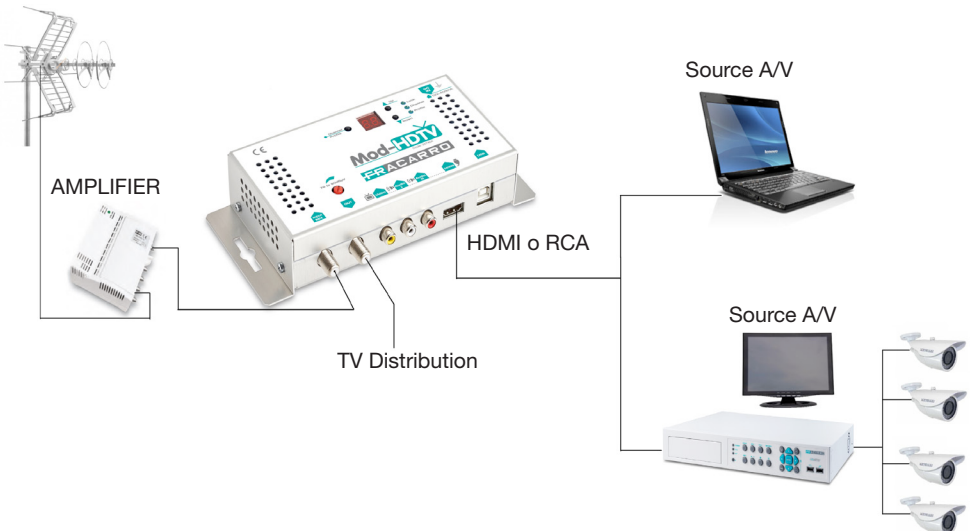


Fig. 3 Exemple d'installation

Fonction auto-reset e watchdog

Pendant le fonctionnement du MOD-HDTV, la CPU contrôle le bon fonctionnement du produit. Dans le cas d'une anomalie elle démarre la procédure de récupération, fait un reset du produit et le redémarre.

Protection de la programmation

Après une minute d'inactivité des touches, celles-ci sont bloquées pour éviter que la programmation soit modifiée accidentellement.

Deux points rouges sur l'afficheur indiquent que les touches sont bloquées. Pour pouvoir accéder à nouveau à la programmation appuyez en même temps sur les touches UP/DOWN pendant cinq secondes (Fig.4).

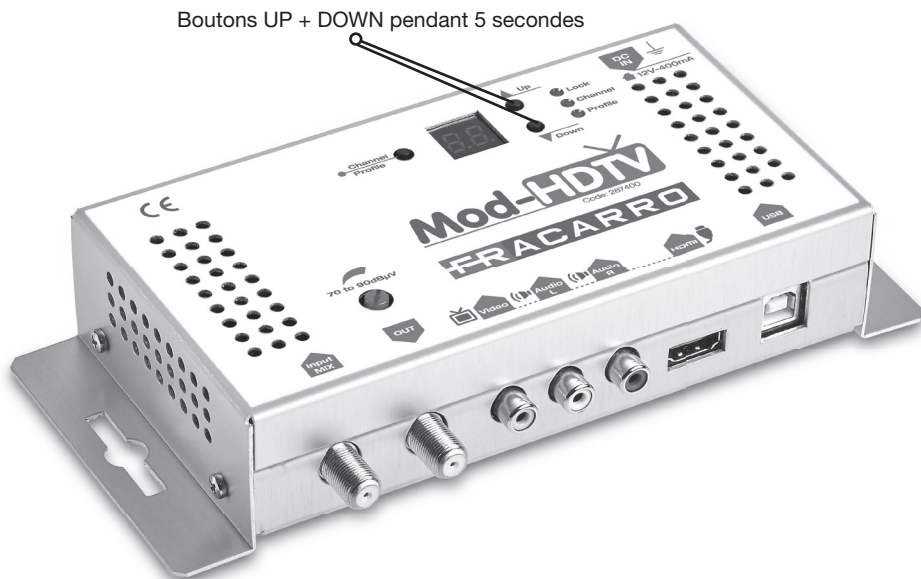


Fig. 4

Mode source d'entrée redondante

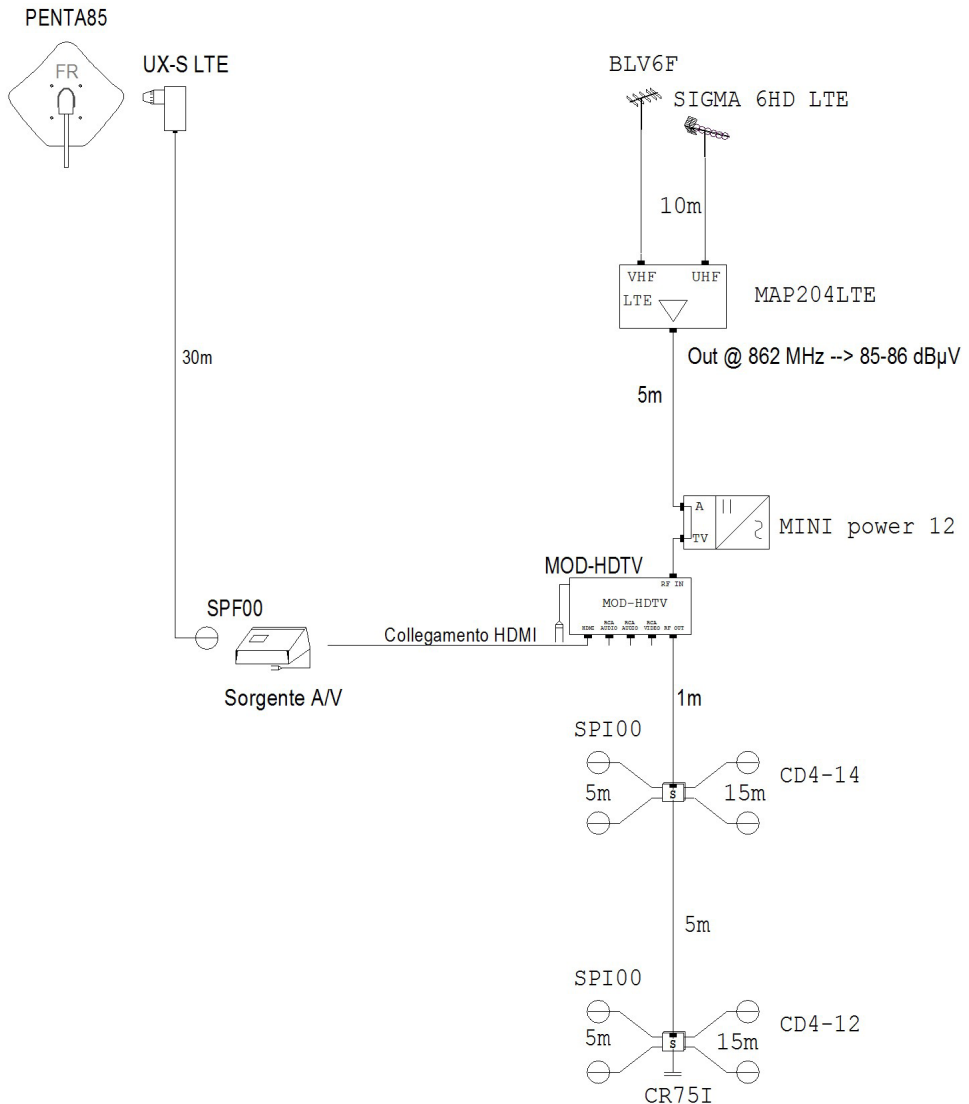
Lorsque le modulateur MOD-HDTV détecte une source à l'entrée, par exemple à l'entrée HDMI, il la "marque" comme source primaire. En cas de panne de la source primaire le modulateur bascule automatiquement sur la source secondaire, dans notre cas l'entrée RCA.

Si au moment de l'allumage les deux sources sont branchées la source primaire est celle branchée à l'entrée RCA.

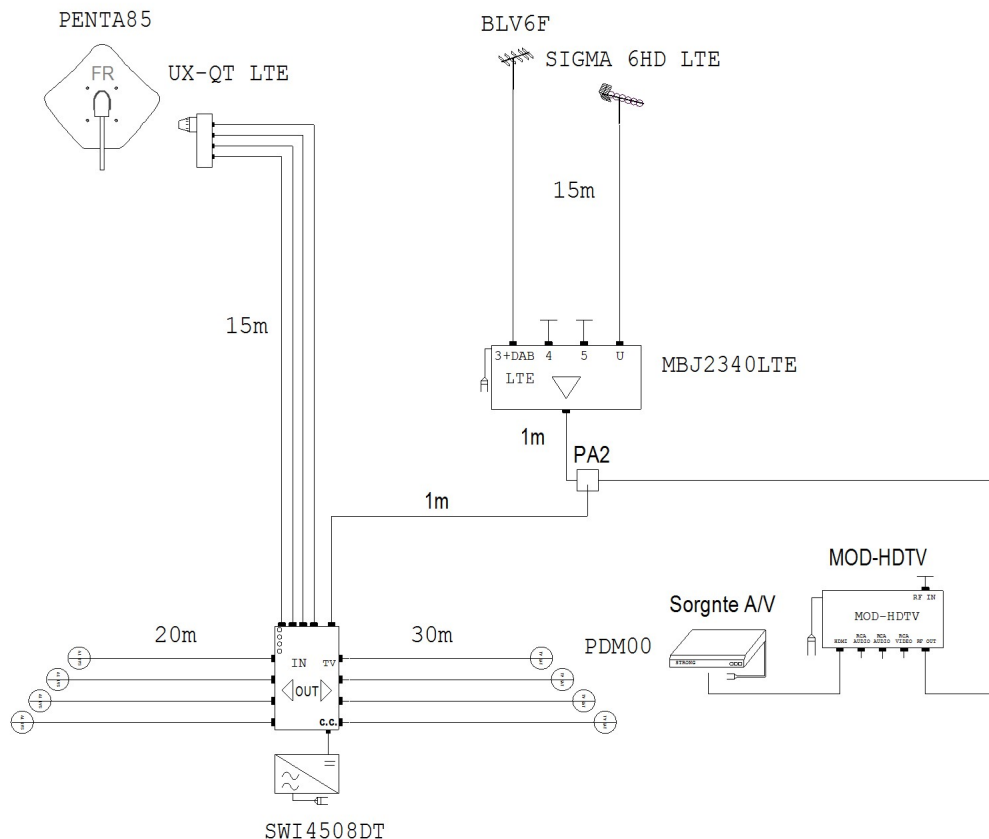
Port USB pour la programmation avancée

Le port USB du modulateur permet de le programmer par PC grâce au logiciel dédié.

4. EXEMPLES DE CONFIGURATION



Exemple n° 1



Exemple n° 2

5. INSTRUCTIONS DE PROGRAMMATION

Le MOD-HDTV peut être programmé de la manière suivante:

- Avec les touches et l'afficheur en façade
- Par PC grâce au logiciel dédié

Programmation par afficheur et touches.

Le modulateur MOD-HDTV peut être programmé en 4 étapes :

Premier pas

Branchez l'alimentation 12V-1A fournie au modulateur. La mise en route prendra environs 20 secondes.

Deuxième étape

Le modulateur démarre en « Channel mode » et l'afficheur (2) montre le numéro de canal par défaut (c. 21). Pour modifier le numéro de canal utilisez les touches UP/DOWN (3). Attendez 10 secondes environs pour que la modification soit effective.

Les canaux disponibles sont : VHF E05-E12 et UHF E21-E69.

Troisième étape

Réglez le niveau de sortie avec l'atténuateur (5) entre 70 dBµV et 90 dBµV

Quatrième étape

Si vous disposez de plusieurs modulateurs vous pouvez utiliser le « mode Profile » qui permet d'associer un profil différent à chaque modulateur de façon à éviter des conflits lors de la syntonisation des téléviseurs.

Attention : après 1 minute d'inactivité les touches du MOD-HDTV seront bloquées. Pour les débloquent appuyez en même temps sur les touches UP/DOWN (3) pendant 5 secondes.

Fonction Profile mode

Dans une installation avec plusieurs modulateurs pour éviter des conflits lors de la syntonisation des téléviseurs les suivants paramètres des multiplexes générés doivent avoir des valeurs différentes.

Program Name	Service ID	TS ID
--------------	------------	-------

Pour cette raison il faut choisir un profil différent pour chaque modulateur :

Profil N° 1 pour le premier modulateur, **Profil N° 2** pour le deuxième, ... **Profil N° 10** pour le dixième, etc.

Paramètres préprogrammés des profils

Profil n° 1

- **Program Name = DTV 1**
- **Service ID = 1**
- **TS ID = 2240**

Profil n° 2

- **Program Name = DTV 2**
- **Service ID = 2**
- **TS ID = 2241**

Profil n° 3

- **Program Name = DTV 3**
- **Service ID = 3**
- **TS ID = 2242**

La mémorisation dure environs 20-30 secondes.

PROGRAMMATION PAR LOGICIEL

Il est possible d'effectuer les réglages avancés du MOD-HDTV modulateur via la connexion USB à l'ordinateur et en utilisant le logiciel. Le logiciel et les pilotes sont disponibles pour téléchargement sur la section des produits du site de www.fracarro.it.

Systèmes d'exploitation

- **Windows XP (SP1 o superiore)**
- **Windows Vista**
- **Windows 7 (32 e 64bit)**
- **Windows 8 (32 e 64bit)**

Connexion du dispositif

1. Téléchargez le logiciel du site www.fracarro.com dans la section Téléchargements
2. Décompressez le fichier téléchargé “FR software MOD-HDTV”.
3. Branchez le MOD-HDTV au PC avec un câble USB (type A-mâle B-mâle).
4. Attendez quelques minutes pour l'installation automatique des pilotes USB.
5. Si les pilotes USB ne s'installent pas automatiquement, Windows vous demandera de les installer manuellement. Renseignez le parcours du dossier “USB Drivers”, qui contient les pilotes du MOD-HDTV.
6. Une fois les pilotes installés lancez le programme “FRACARRO GUI 2v0”. La fenêtre suivante s'affichera.

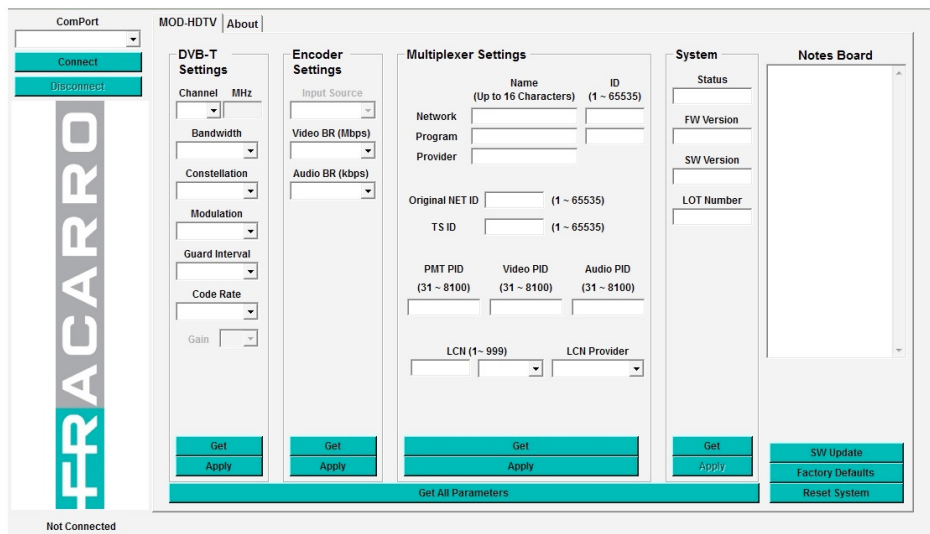


Fig.5

Guide au logiciel

- 1-Sélectionnez du Menu “ComPort” le port USB qui est connecté au MOD-HDTV et cliquez sur “Connect”.

ComPort: COM4

MOD-HDTV | About

DVB-T Settings

Channel: [] MHz: []

Bandwidth: []

Constellation: []

Modulation: []

Guard Interval: []

Code Rate: []

Gain: []

Encoder Settings

Input Source: []

Video BR (Mbps): []

Audio BR (kbps): []

Multiplexer Settings

Name (Up to 16 Characters): [] ID (1 ~ 65535): []

Network: []

Program: []

Provider: []

Original NET ID: [] (1 ~ 65535)

TS ID: [] (1 ~ 65535)

PMT PID (31 ~ 8100): [] Video PID (31 ~ 8100): [] Audio PID (31 ~ 8100): []

LCN (1~ 999): [] LCN Provider: []

System

Status: []

FW Version: []

SW Version: []

LOT Number: []

Notes Board

Get All Parameters

Get Apply

Get Apply

Get Apply

Get Apply

SW Update

Factory Defaults

Reset System

Not Connected

2-Si le modulateur est branché correctement les paramètres de celui-ci seront affichés.

ComPort: COM4

MOD-HDTV | About

DVB-T Settings

Channel: 40 MHz: 626

Bandwidth: 8MHz

Constellation: QAM-64

Modulation: 8k

Guard Interval: 1/32

Code Rate: 7/8

Gain: 0

Encoder Settings

Input Source: Auto

Video BR (Mbps): 18500

Audio BR (kbps): []

Multiplexer Settings

Name (Up to 16 Characters): Fracarro ID (1 ~ 65535): 8720

Network: Fracarro

Program: FR_HD

Provider: Fracarro

Original NET ID: 8720 (1 ~ 65535)

TS ID: 2210 (1 ~ 65535)

PMT PID (31 ~ 8100): 500 Video PID (31 ~ 8100): 501 Audio PID (31 ~ 8100): 502

LCN (1~ 999): 123 Enable ECTA/Europe

System

Status: []

FW Version: []

SW Version: []

LOT Number: []

Notes Board

Get All Parameters

Get Apply

Get Apply

Get Apply

Get Apply

SW Update

Factory Defaults

Reset System

3- La fenêtre du logiciel “FRACARRO GUI 2v0” est composée de 4 colonnes:

- **DVB-T Settings** – paramètres de modulation
- **Encoder Settings** – paramètres de l’encodeur H.264
- **Multiplexer Settings** – paramètres du MUX numérique
- **System Settings** – paramètres d’information du système

The screenshot shows the FRACARRO web interface with four main settings panels highlighted by red boxes and red arrows:

- DVB-T Settings:** Includes Channel (40), MHz (626), Bandwidth (8MHz), Constellation (QAM-64), Modulation (8k), Guard Interval (1/32), Code Rate (7/8), and Gain (0).
- Encoder Settings:** Includes Input Source (Auto), Video BR (Mbps) (18500), and Audio BR (kbps).
- Multiplexer Settings:** Includes Name (Fracarro), ID (8720), Network (Fracarro), Program (FR_HD), Provider (Fracarro), Original NET ID (8720), TS ID (2210), PMT PID (500), Video PID (501), Audio PID (502), LCN (123), and LCN Provider (EICTA Europe).
- System Settings:** Includes Status, FW Version, SW Version, and LOT Number.

At the bottom, there are buttons for 'Get All Parameters', 'SW Update', 'Factory Defaults', and 'Reset System'.

Réglages DVB-T:

Ce menu permet de paramétrer le signal de sortie du modulateur:

- **Channel** - sélection du canal de sortie (VHF: 5-12 ou UHF: 21-69).
- **Bandwidth** - élection de la largeur de bande du canal de sortie (VHF: 7MHz - UHF: 8MHz).
- **Constellation** - sélection de la constellation (QPSK, QAM-16, QAM-64).
- **Modulation** - sélection du nombre de porteuses (2K, 4K, 8K).
- **Guard Interval** - sélection de l'intervalle de garde (1/4, 1/8, 1/16, 1/32).
- **Code rate** - sélection du taux de codage (1/2, 2/3, 3/4, 5/6, 7/8).

Paramètres de l'encodeur

Ce menu permet de paramétrer l'encodeur H.264:

- **Input source** - sélection de la source d'entrée primaire (HDMI ou RCA).
- **Video BR (Mbps)** - paramétrage du débit vidéo.
- **Audio BR (Kbps)** - paramétrage du débit audio.

Paramètres de multiplexeur

Ce menu permet de paramétrer le MUX numérique:

- **Network Name + ID** – Nom du MUX et numéro
- **Program Name + ID** – Nom du programme et numéro identifiant
- **Provider Name** – Nom de l'opérateur
- **Original Net ID** – Paramétrage du Net ID
- **TS ID*** - Paramétrage du TS ID
- **PMT PID** - Paramétrage du PMT PID
- **Video PID** - Paramétrage du PID Vidéo
- **Audio PID** - Paramétrage du PID Audio
- **LCN (1-999)** - Paramétrage du numéro de programme LCN e activation-désactivation.
- **LCN Provider** – Paramétrage Pays LCN.

* **NOTA:** si dans l'installation il y a plusieurs modulateurs, vérifiez que le TS ID soit différent pour chaque modulateur afin d'éviter des conflits.

ATTENTION: Les paramètres de modulation doivent être renseignés de façon à avoir un débit de sortie correct. Le débit de sortie (qui peut être calculé à l'aide des tableaux A, B et C) doit être égal ou supérieur à la somme totale du débit vidéo et audio.

Exemple: En utilisant les paramètres de modulation suivants:

Modulation: 8K
Constellation: 16-QAM
Code Rate: 5/6
Guard Interval: 1/32
Bandwidth: 8MHz

Nous obtenons un débit de sorte de 20,107 Mbps (voir tableaux A ,B, et C). Dans l'option **Encoder Settings** la somme des **débits audio et vidéo** ne doit donc pas dépasser les 20,107Mbps,

Les paramètres du système

Cette colonne présente l'état du modulateur:

- **Status** - indique l'état du modulateur.
- **FW Version** - version du micrologiciel
- **SW Version** - version du logiciel.
- **HW Version** - version hardware
- **Serial number** - numéro de série du produit.

Touches

GET: En cliquant sur "Get", toutes les informations de la colonne concernée sont récupérés du modulateur.

APPLY: En cliquant sur "Apply" tous les paramètres de la colonne concernée sont envoyés au modulateur.

FACTORY DEFAULTS: permet de revenir à la configuration d'usine.

RESET SYSTEM: permet de faire un reset du modulateur.

Exemple de paramétrage pour la France

The screenshot shows the FRACARRO MOD-HDTV configuration interface. The interface is divided into several sections:

- ComPort:** Shows 'COM7' and buttons for 'Connect' and 'Disconnect'.
- DVB-T Settings:** Includes fields for Channel (21), MHz (474), Bandwidth (8MHz), Constellation (QAM-64), Modulation (8k), Guard Interval (1/8), Code Rate (3/4), and a 'Get' button.
- Encoder Settings:** Includes fields for Video BR (Mbps) (18500), Audio BR (Mbps) (320), and a 'Get' button.
- Multiplexer Settings:** Includes fields for Name (FRACARRO), ID (12289), Program (FRFR 1), Provider (FRACARRO), Original NET ID (8442), TS ID (2210), PMT PID (500), Video PID (501), and Audio PID (502). There are 'Get' and 'Apply' buttons for this section.
- System:** Includes fields for Status (No Video Input!), FW Version (7.4.43 - 01.75), SW Version (2.0), and LOT Number (0108150005). There are 'Get' and 'Apply' buttons for this section.
- Notes Board:** A text area for notes.
- Buttons:** At the bottom, there are buttons for 'Get All Parameters', 'SW Update', 'Factory Defaults', and 'Reset System'.

TABELLA A - TABEL A - TABLEAU A

Modulazione Modulation Modulation	FEC	Intervallo di guardia - Guard Interval - Intervalle de Garde			
		1/4	1/8	1/16	1/32
QPSK	1/2	4.976	5.529	5.855	6.032
	2/3	6.635	7.373	7.806	8.043
	3/4	7.465	8.294	8.782	9.048
	5/6	8.294	9.216	9.758	10.053
	7/8	8.709	9.676	10.246	10.556
16-QAM	1/2	9.953	11.059	11.709	12.064
	2/3	13.271	14.745	15.612	16.086
	3/4	14.929	16.588	17.564	18.096
	5/6	16.588	18.431	19.516	20.107
	7/8	17.418	19.353	20.491	21.112
64-QAM	1/2	14.929	16.588	17.564	18.096
	2/3	19.906	22.118	23.419	24.128
	3/4	22.394	24.882	26.346	27.144
	5/6	24.882	27.647	29.273	30.160
	7/8	26.126	29.029	30.737	31.668

TABELLA A:

bitrate DVB-T (Mbit/s) **8 MHz** per la larghezza di banda (sistemi non-gerarchici)

TABEL A:

DVB-T bitrates (Mbit/s) for **8 MHz** bandwidth (non-hierarchical systems)

TABLEAU A :

Débit (Mbit/s) pour une largeur de bande de **8 MHz**

TABELLA B - TABEL B - TABLEAU B

Modulazione Modulation Modulation	FEC	Intervallo di guardia - Guard Interval - Intervalle de Garde			
		1/4	1/8	1/16	1/32
QPSK	1/2	4.354	4.838	5.123	5.278
	2/3	5.806	6.451	6.830	7.037
	3/4	6.532	7.257	7.684	7.917
	5/6	7.257	8.064	8.538	8.797
	7/8	7.620	8.467	8.965	9.237
16-QAM	1/2	8.709	9.676	10.246	10.556
	2/3	11.612	12.902	13.661	14.075
	3/4	13.063	14.515	15.369	15.834
	5/6	14.515	16.127	17.076	17.594
	7/8	15.240	16.934	17.930	18.473
64-QAM	1/2	13.063	14.515	15.369	15.834
	2/3	17.418	19.353	20.491	21.112
	3/4	19.595	21.772	23.053	23.751
	5/6	21.772	24.191	25.614	26.390
	7/8	22.861	25.401	26.895	27.710

TABELLA B:
bitrate DVB-T (Mbit/s) **7 MHz** per la larghezza di banda (sistemi non-gerarchici)

TABEL B:
DVB-T bitrates (Mbit/s) for **7 MHz** bandwidth (non-hierarchical systems)

TABLEAU B :
Débit (Mbit/s) pour une largeur de bande de **7 MHz**

TABELLA C - TABEL C - TABLEAU C

Modulazione Modulation Modulation	FEC	Intervallo di guardia - Guard Interval - Intervalle de Garde			
		1/4	1/8	1/16	1/32
QPSK	1/2	3.732	4.147	4.391	4.524
	2/3	4.976	5.529	5.855	6.032
	3/4	5.599	6.221	6.587	6.786
	5/6	6.221	6.912	7.318	7.540
	7/8	6.532	7.257	7.684	7.917
16-QAM	1/2	7.465	8.294	8.782	9.048
	2/3	9.953	11.059	11.709	12.064
	3/4	11.197	12.441	13.173	13.572
	5/6	12.441	13.824	14.637	15.080
	7/8	13.063	14.515	15.369	15.834
64-QAM	1/2	11.197	12.441	13.193	13.572
	2/3	14.929	16.588	17.564	18.096
	3/4	16.796	18.662	19.760	20.358
	5/6	18.662	20.735	21.995	22.620
	7/8	19.595	21.772	23.053	23.751

TABELLA A:
bitrate DVB-T (Mbit/s) **6 MHz** per la larghezza di banda (sistemi non-gerarchici)

TABEL A:
DVB-T bitrates (Mbit/s) for **6 MHz** bandwidth (non-hierarchical systems)

TABLEAU A :
Débit (Mbit/s) pour une largeur de bande de **6 MHz**

SPECIFICHE TECNICHE - TECHNICAL SPECIFICATIONS - TECHNICAL SPECIFICATIONS

Input	
Type:	1 x HDMI & 1 x CVBS
Connector:	1 x HDMI & 1 x RCA – Female (White, Red, Yellow)
Video coding:	MPEG-4 AVC/H.264
Profile:	High profile 4.0
Resolution:	1920x1080-30p for HDMI PAL 720x576@25fps
HDCP support:	Yes
Audio:	HDMI & Mono/Stereo
Standard:	MPEG-1 Layer II
Audio Bit Rate:	64, 96, 128, 192, 256, 320, 384 kbps
Level:	0.5Vpp to 1.0Vpp adjustable
H.264 Encoder	
Standard:	MPEG-4 AVC/H.264
Bit Rate:	1 – 19 Mb/s adjustable
Configurable Parameters:	Service Name, Service ID, Video PID, Audio PID, PMT PID
Transport Stream Processing	
Automatic Regeneration:	NIT,PAT,CAT,SDT, PMTs, EITs tables
Configurable Parameters:	TS ID, Original Network ID, Network ID, Provider Name
LCN support:	Yes
LCN Providers:	Nordig, ITC/UK, EICTA/Europe, New Zealand
DVB-T Output	
Standard:	EN 300 744
Bandwidth:	5,6,7,8 MHz
Mode:	2K,8K
Constellation:	QPSK,16QAM, 64QAM
Guard Interval:	1/4, 1/8, 1/16, 1/32
Code Rate:	1/2, 2/3, 3/4, 5/6, 7/8
RF Output	
Type:	RF DVB-T (COFDM)
Output Frequencies:	174...862MHz (1 Hz step)
Output Level:	90dbμV max.
Connector:	75Ω - F, female
Output Attenuator:	0...20dB
MER:	35dB (Typical)
Shoulder Attenuation:	>45dBc
Output loop-through loss:	<1dB
Connectors:	2 x F - female
Programming Interface	
SSDisplay + keypad + USB interface	
General	
Power Supply:	+12VDC
Power supply consumption:	400 mA max.
Operating Temperature:	0 °C to 50 °C
Storage Temperature:	-10 °C to +70 °C
Humidity:	Up to 90%
Dimensions:	205 x 101,80 x 41mm
Weight:	0.3Kg

7. I: CONFORMITÀ ALLE DIRETTIVE EUROPEE
GB: EUROPEAN DIRECTIVES CONFORMITY

F: CONFORMITÉ AUX DIRECTIVES EUROPÉENNES
E: CONFORMIDAD CON LAS DIRECTIVAS EUROPEAS

- I: Conforme alle norme EN 50083-2 (direttiva europea 2004/108/EC – EMC)
ed EN 60065 (direttiva europea 2006/95/EC – LVD);
- GB: It complies with the standards EN 50083-2 (European Directive 2004/108/EC – EMC)
and EN 60065 (European Directive 2006/95/EC – LVD);
- F: Conformes aux normes EN 50083-2 (directive européenne 2004/108/EC – EMC)
et EN 60065 (directive européenne 2006/95/EC – LVD);
- E: Cumplen con las normas EN 50083-2 (directiva europea 2004/108/EC – EMC)
y EN 60065 (directiva europea 2006/95/EC – LVD);

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Garantovano od/ Gwarantowane przez / Εγγυημένο από/ Гарантировано
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