

MCTX

Installing a Second Upconverter

Introduction.

For some installations where a second reception area is required which is outside of the range of the first aerial it is more economical to transmit the Audeon signals from a second upconverter rather than installing a complete Audeon system.

The baseband processor which supplies the VHF signals and DC power to the upconverter is designed to accommodate up to 4 upconverters. Although installation should be simple there are a number of technical issues which will need to be addressed.

Please note that processors with serial numbers earlier than S.No 34 can not have a second upconverter installed.

Transmitting on the same frequencies

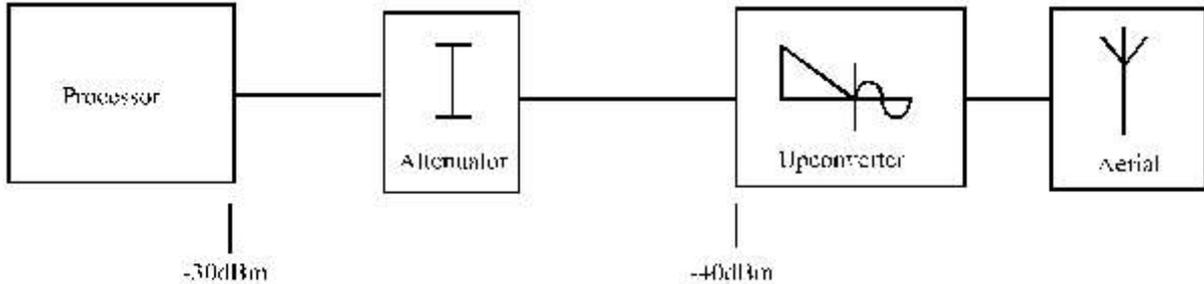
If two upconverters are in use there may be problems when the service area of the two aerials overlap. When the radio signals arrive at the receiver from two different aerials the length of the signal path will be different from each aerial. This will mean that the signals will not be in phase therefore fading will occur in the area where the signals meet. To avoid the problems of overlap care will need to be taken with the placement of the two aerials. If the aerials are located some distance apart (over 100 metres) then this should not be a problem.

If the aerials are in adjacent rooms the wall between the rooms will attenuate the signals so reducing the interfering effect. To further reduce the interference placing the aerial so that the interference zone is in the area of the wall will also help. Do not place an aerial on the common wall and the other at the far end of the adjacent room as this will cause interference between the high level signal and the low level one from the far end.

Walls, floors and voids such as corridors can provide a suitable buffer between the two aerials but care will be needed and on site trials with a temporary aerial is recommended.

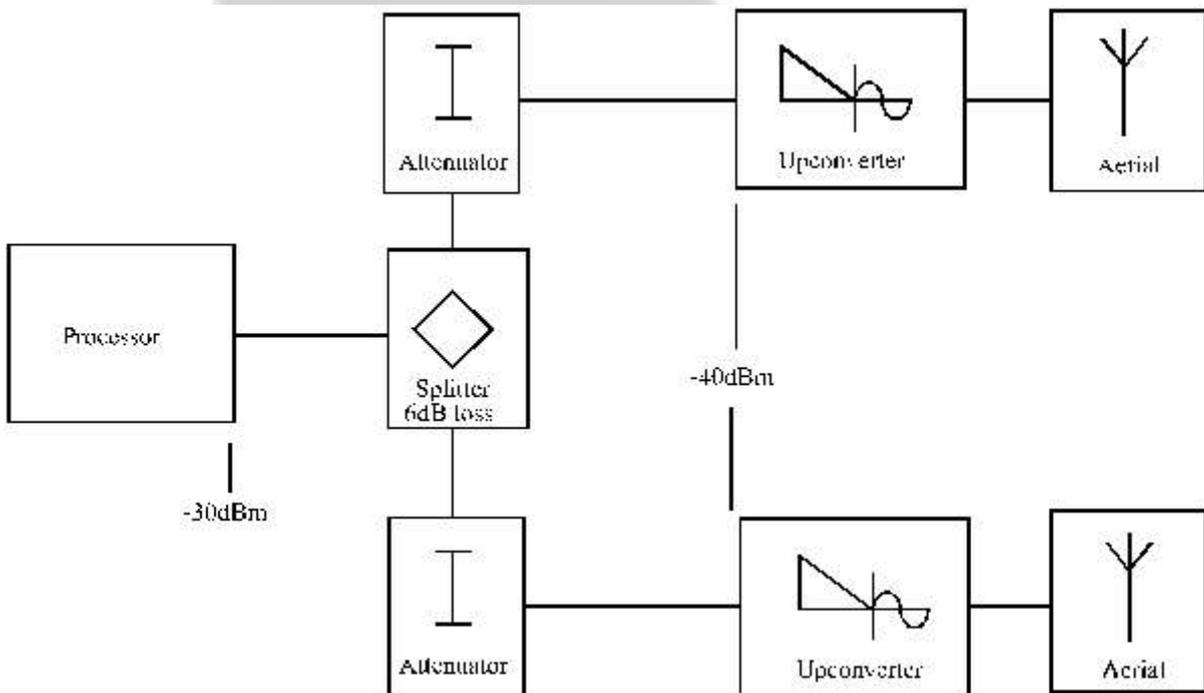
Installing one upconverter

The diagram below shows the arrangement for connecting the upconverter to the processor, for the full installation instructions please refer to the MCTX installation manual.



Installing Two Upconverters

The VHF output of the processor is set at -30dBm and the input to the upconverter is -40 dBm to allow for up to 10dB of cable loss. It is very important that the input signal to the upconverter does not exceed the -40dBm input as over modulation of the upconverter will occur causing interference to other radio services which may generate complaints to OFCOM (You do not need this hassle).



To send the VHF signal to the two upconverters a 50 ohm splitter will be required in the signal



Multi Channel Transmitter (MCTX) - Installation of a Second Upconverter

path. A passive splitter will have a loss of 6dB leaving 4dB for the cable loss. For short cable runs a 3dB attenuator will be adequate for matching the signal level to the upconverter. For long cable runs you may not require an attenuator or the signal may arrive below -40dBm. The choice of cable used will determine the loss so try to restrict it to no more than 4 dB. The table below shows the lengths of common cables you may use (see appendix 1 of the MCTX instruction manual). Please note that the cable loss + splitter + attenuator loss must be 10dB or greater.

Coax Cable Losses

Cable	Impedance	Loss per Metre @ 100 MHz	Cable length for 4dB loss
RG 58	50 ohms	0.21 dB	19 metres
RG 223	50 ohms	0.14 dB	28 metres
UR M43	50 ohms	0.13 dB	30 metres
UR M67	50 ohms	0.07 dB	57 metres
UR M70	75 ohms	0.15 dB	26 metres
UR M76	50 ohms	0.16 dB	25 metres
CT100	75 ohms	0.06 dB	66 metres

The system impedance is 50 ohms so you should use 50 ohm cables and connectors though very short lengths of 75 ohm cable do not appear to have too much of an adverse effect. Mismatch between equipment and cables will cause standing waves to occur which will either subtract or add to the received signal at the upconverter. Mismatch should be avoided.

For the best performance the attenuator should be installed adjacent to the upconverter.

The +15v DC power feed (fc) can be split using a “T” BNC adapter as there is no other signal transmitted down this cable (processors before serial no 34 are not able to feed more than one upconverter due to design differences).

In some cases there may be areas where you are unable to have the interference zone located at a boundary. To move the zone you will need to reduce the signal strength of one of the aerials by increasing the loss to the upconverter for that aerial. The area covered by the radiated signal is reduced by 50% when the signal is reduced by 6dB.

If you have any questions please contact the Audeon service line on +44 113 252 5582 for advice.
