

Micro_Link

Mega_Link

APPLICATION NOTE AN026

Advice on Channel Frequency Selection

Summary

Ofcom, the UK's communications regulator, recently published the outcome of a strategic review of the UHF Band 1 & 2 spectrum usage which potentially impacts some of the channel frequencies in use by Churchill Controls' radio telemetry equipment.

10 of the 37 channels which have historically been allocated for licence exempt users only are now also being made available for licenced radio purposes.

This application note gives some advice to be followed in the event of experiencing interference to existing telemetry systems and identifies which channel frequencies it would be prudent to avoid going forward in new system installations.

1. Introduction & Background

Ofcom, the UK's communications regulator, published their consultation document, '*Strategic Review of UHF Band 1 and Band 2 410 to 470 MHz*', dated December 2016.

They subsequently released a statement about this, published on 25th May 2017, which potentially impacts some of the channel frequencies which may be in use by currently installed Churchill Controls' radio telemetry equipment.

The UHF Band 2 covers 450 to 470 MHz and a sub-band of this, from 458.5 to 459.5 MHz, is allocated to licence exempt short range devices (SRD). Within this licence exempt SRD sub-band, this is further sub-divided into the 458.5 to 458.95 MHz sub-band specifically intended for Industrial/Commercial Telemetry and Telecommand applications.

This is the sub-band where most Churchill Controls radio telemetry equipment operates in the UK at the 0.5W power level allowed for low power radio.

2. Outcome of Consultation

As a result of the consultation outcome statement, see page 19/20, section 4.25, Ofcom have decided to also share 10 channels from the 37 channels available in this sub-band with new Simple Site licence and Simple UK licences purposes.

These licences allow a power up to 2W and at the time of writing it is unclear what these licences will be used for other than the term business radio. The risk is that at some time in the future these new licenced channel frequencies will begin to become occupied by new users and if this happens within range of already installed Churchill Controls' equipment coincidentally set to use the same channel frequency, then there is the risk of mutual interference.

3. Advice in the Event of Adverse Interference

This applications note is intended to give some advice in the event of experiencing interference to existing telemetry systems and to identify which channel frequencies it would be prudent to avoid in new system installations going forward.

It is important to understand that at the end of the day, we are not necessarily losing the use of 10 channels on existing customer installations, just an increased risk of interference on actually 9 out of the normally 32 channels which Churchill Controls equipment may be set to.

In the event of adverse interference being experienced in the form of an increased frequency of "Comms Fail" events, then a channel survey should be performed to identify the best alternative "free" unoccupied channel, within the remaining 32-9-1=22 channels available, there should be plenty of other channels to switch over to.

Clearly, going forward it would be prudent to avoid setting new equipment installations to these shared frequencies to avoid any future issues when licences begin to be issued.

See frequency and channel numbering for *Micro_Link* and *Mega_Link* in tabular form on next page.

Also worth noting, as an alternative *Mega_Link* can be fitted with a 869 MHz radio module which offers another 10 licence exempt channels and there have been no changes there. For *Mega_Link* there is also the option of dual communications, using two radio modules (and two sets of aerials) to give redundancy against interference blocking a channel.

4. Modifying Configuration File to Change Channel

The software package for *Micro_Link* is called *DCD* and for *Mega_Link* it is called *DUCX* and these are available for free download from Churchill Controls' website.

<http://www.churchill-controls.co.uk/downloads-2/>

In both cases it is simple enough to plug in a laptop using a special lead for *Micro_Link* and a standard USB-A to USB-B lead for *Mega_Link*.

First upload the existing configuration file, modify the relevant channel selection setting and then save and download into the basestation unit. Then repeat this procedure for each of the outstations in turn, first uploading, modifying the channel selection and then downloading again at each individual unit.

Table of Frequency Channel Numbers

UHF2 band	Sub-band	Allocated band	Freq (MHz)	Churchill Controls <i>Micro_Link</i> Channel No.	Churchill Controls <i>Mega_Link</i> Channel No.	Channels now Shared with Simple Site and Simple UK Licences
450 to 470 MHz	Licence free short range devices (SRD)	Telemetry and Tele-command	450.0000			
			...			
			...			
			458.5000	0		
			458.5125	1	1	Avoid for future
			458.5250	2	2	
			458.5375	3	3	
			458.5500	4	4	
			458.5625	5	5	
			458.5750	6	6	
			458.5875	7	7	
			458.6000	8	8	
			458.6125	9	9	
			458.6250	10	10	
			458.6375	11	11	
			458.6500	12	12	
			458.6625	13	13	
			458.6750	14	14	
			458.6875	15	15	
			458.7000	16	16	
			458.7125	17	17	
			458.7250	18	18	
			458.7375	19	19	
			458.7500	20	20	
			458.7625	21	21	
			458.7750	22	22	Avoid for future
			458.7875	23	23	
			458.8000	24	24	
			458.8125	25	25	
			458.8250			
			458.8375			
			458.8500	28	26	
			458.8625	29	27	
			458.8750	30	28	
458.8875	31	29				
458.9000		30				
458.9125	33	31				
458.9250	34	32				
458.9375						
458.9500						
458.9625						
458.9750						