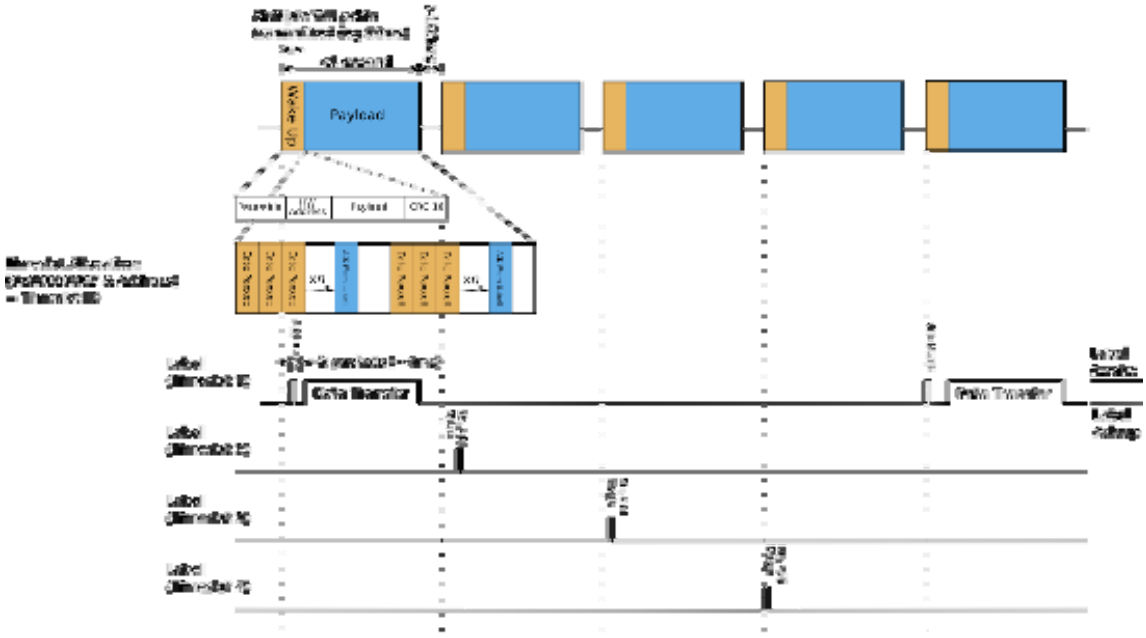
1.1 V3 Protocol

1.1.1 Summary

This protocol utilises a periodic series of synchronisation pulses transmitted by a base station to enable time division multiplexing of the data to be sent to the target displays.



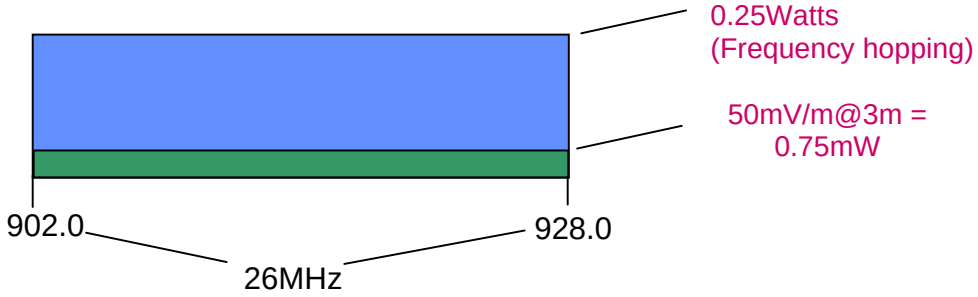
The sync pulse also contains information on which displays the base-station wishes to communicate with in that timeslot as well as a measure of exactly where in the timeslot the display has woken up.

During the period between the sync pulses the displays will be in a deep sleep mode running off a low-power RC oscillator. This is the feature that extends battery life considerably.

Data packets are broadcast after each sync pulse with the maximum combined time of each sync pulse/data packet burst being no more than 1s. This is to comply with the relevant European radio regulations. LBT (listen-before-talk) is implemented between timeslots to reduce the effect of duty cycle restrictions. Data packets are acknowledged in groups to increase the protocol efficiency. All packets have a unique ID and are repeated if they fail to get through due to interference.

Displays are also placed into distinct timeslots based on the LSB of their address, allowing the polling period to be further extended. This is to ensure an even distribution of displays in a store.

1.1.2 US Spectrum Regulations



The US regulations allow us to use the entire 902-928 MHz band as long as we use only 0.75mW ERP.

If more power is required either Frequency Hopping has to be used (with a dwell time of 0.4s) or wideband modulation (e.g DSSS).

The US version of the protocol transmits at a power level of 0.75mW. This maximises compatibility with the European version of the system. To compensate for the reduced ERP and therefore range the system is designed to handle multiple base-stations. Larger areas can be covered by this system by increasing the number of transmitters.