

External Synchronization

General Description

All of Rantec's High Density DC-to-DC converters have an available Synchronization option. This option allows the user to control the operating frequency of the converter by applying a synchronization signal at the desired operating frequency at the "Sync" pin of the converter. A standard module with the synchronization option will have a nominal free-running frequency of approximately 300KHz, and has the ability to be synchronized at any desired frequency between 330KHz and 370KHz.

Implementation

The sync signal can be either direct-coupled, as shown in Figure 1, or through an isolation circuit as shown in Figure 2. Either method can be used with any Rantec HDM model with a sync input. Rantec highly recommends using an isolated method of synchronizing the converters.

Table 1 provides limits for sync frequency, sync signal width, and sync signal amplitude. Synchronizing the converters to frequencies outside this range is possible. Please consult the factory for your specific needs.

The synchronization signal pulse should be between 50nS and 150nS wide. The pulse should have an amplitude between 1V and 2V into a 24Ω load, as the internal impedance of the converters is 24Ω. This method keeps the currents localized to each synchronized converter. This is especially important when connecting modules in a parallel or series application (see HDMA-101 and HDMA-110). Note that the synchronization signal is referenced to the -Vin pin on the HDM, HDM+, and HDM-LP series converters (see Figure 3); whereas the synchronization signal is referenced to the -Sense pin on the HDM-200 and HDM-LLP series converters (see Figure 4).

| Pulse Characteristics for Sync Input Signal | | | |
|---|---------|-------------|---------|
| Parameter | Minimum | Recommended | Maximum |
| Frequency | 330KHz | 350KHz | 370KHz |
| Width | 50nS | 100nS | 150nS |
| Amplitude (into 24 Ω) | 1.0V | 1.5V | 2.0V |

Table 1. Rantec recommends synchronizing the converters at 350KHz. The pulse amplitude is when loaded into 24 ohms.

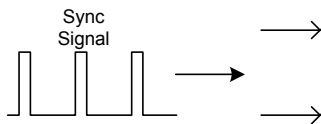


Figure 1 :Typical Direct-Coupled External Sync Circuit

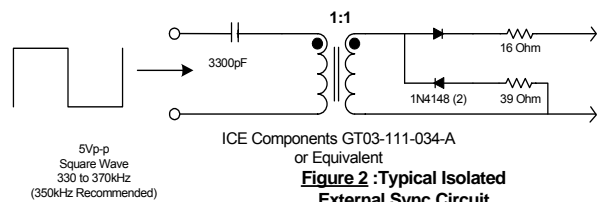


Figure 2 :Typical Isolated External Sync Circuit

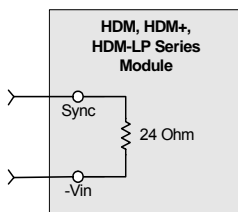


Figure 3 :HDM, HDM+, HDM-LP Sync Connection

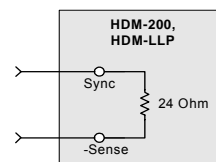


Figure 4 : HDM-200,HDM-LLP Sync connection