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Selecting the right core for your MIL-STD-1553 (1553) application

Sital Technology offers several 1553 Remote Terminal (RT) cores. These cores are intended for different applications. A proper selection of the right core would reduce design and maintenance efforts.

The RT1553FE is an RT core intended for subsystems that need 1553 interface but the messages transferred to and from the RT are defined as “simple”.

“Simple” means that every 1553 message is composed of a command pointing to a Sub Address (SA), and indicating the number of words for that SA. (i.e., SA is the paragraph, and the words are the sentences). If the words are dealt with individually for all the messages, then the RT is defined as simple.

On the other hand, if 2 or more words define a data record such that if one of the words of the record has errors then the whole record is an error, the messages could not be defined as simple.

For example: Assume an ICD (Interface Communication Document) for an F-16 camera RT uses two SAs. The first SA has one word. If this word's value is 0xAAAA, then the camera should start recording, and if its 0xB BBB it should stop. The second SA has two words for reading. The first word defines the Camera model. The second word indicates the tape position.

This application would be considered a simple RT and can use the RT1553FE core saving the need for a CPU to control 1553 interface to the camera.

Usage of the RT1553FE has shown dramatic development cost reductions gain by saving the need for a CPU and Software development, Hardware-software integration, and firmware maintenance.

An ICD that incorporates a SA with 3 words of which the first define a relative X position, the second word defines the Y position, and the third defines the Z position would not be considered a simple message. If, for some reason, only part of the message is transferred, the whole SA message should be dropped.

For these applications, the RT1553DDC core is a superset of the RT1553FE with a backend logic that arranges the messages in a predefined (By DDC enhanced mini-Ace devices) memory structure that will validate or invalidate a message on a message base rather than on a word base, as does the RT1553FE.

For these applications, the RT1553DDC should be used.

It should be noted that there are other / simpler ways to manage the message level control rather than the method defined by DDC, and these methods could be developed by the user logic that interfaces the RT1553FE.