



File Output Component

FM3TR Waveform Reference Implementation

SDR Forum Contract

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1 Component Name

FileOutput_MAC_LLC

2 Component Processing Summary

The FileOutput_MAC_LLC component stores incoming data to a file. It improves upon the regular FileOutput component by introducing media access control (MAC) and logical link control (LLC) interfaces such that packets may be retransmitted if necessary. It also decodes a special packet containing information about the file generated by the FileInput_MAC_LLC component. This ensures that in the absence of a noisy channel, the output file will be received and written correctly.

3 Where used

The FileOutput_MAC_LLC component is used in all extended data waveforms.

4 Data Input and Output Ports

The component has only one data provides port, "FileOutput_MAC_LLC_In."

5 Control Interfaces

The FileOutput_MAC_LLC inherits the control interfaces from CF::Resource. The component has one additional control interface, "FileOutput_MAC_LLC_ControlIn," which is used for signaling negative acknowledgments (NAKs) for received packets such that they can be corrected.

6 Component SCA Properties

Aside from the DLL execparams, the FileOutput_MAC_LLC component has two properties. The table below lists these properties along with brief descriptions of each.

<i>Simple Name</i>	<i>CORBA Type</i>	<i>Description</i>
Output_File_Name	string	Name and path to the file to be written.
Output_Data_Type	string	Type of data to be read (includes "octet," "char," "short," "ushort," "long," "ulong," "float," and "double").

These are the same as the regular FileOutput component.

7 Component Attributes/Key Variables

Below is a list of several key variables to the FileOutput component with a brief description of their purpose.

file_out	Output file
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data_type	Type of data to be written to the file
data_size	Size of data to be written to the file
packetCounter	Number of packets currently written to the file
eof	Boolean value set to true of the end of the file has been reached
packetFeedbackCounter	Number of packetsfor which ACKs NAKs have been received
errorPackets	Running list of erroneous packets
retransmissionMode	Boolean value specifying if the entire file has been sent, and thus the retransmission of erroneous packets can begin

8 Processing Details

The processing within the FileOutput component is straightforward: data from the provides port “FileOutput_MAC_LLC_In” are written to the filename read from properties. When the waveform stops the output file is closed. There are two main advantages to using this component over the regular FileOutput component, viz.

1. the first packet is a header with information about the file, including the total number of packets, and the number of elements in the last packet;
2. the additional control interface allows for erroneous packets to be detected, and thus overwritten with retransmissions.

The functionality of these mode extensions are handled by the following methods, described below.

8.1 Method: *ExtractHeader()*

As previously stated, the first packet contains information about the file itself. This information is obtained by invoking the ExtractHeader() method. This header contains the following pieces of information:

- Calling platform address
- Called platform address
- Number of packets in the file
- Number of elements in the last packet

8.2 Method: RewritePacket()

The RewritePacket() method is used to overwrite packets which have been received erroneously.

8.3 Method: SignalACK()

When SignalACK() is invoked by the RsBlockDecoder, the packetFeedbackCounter variable is incremented. This allows the FileOutput_MAC_LLC component to track which packets were received correctly.

8.4 Method: SignalNAK()

When SignalNAK() is invoked by the RsBlockDecoder component and the erroneous packet is not a “dummy” packet, its ID stored to the errorPackets list. The packetFeedbackCounter variable is also incremented.