

Decode Search User's manual

November 2012

Introduction

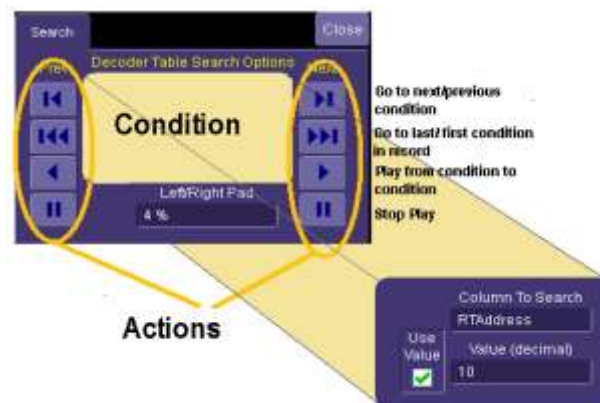
This document explains the Search extensions developed for 6.9.x and used by MIL 1553, ARINC429, MIPI, EFABus, DigRF3G, DigRFV4, 10Gx4 Ethernet, SRIO, SENT, CONFIG-BUS, GDDR5.

The following features are supported:

- Uniform Search User Interfaces, for the users' community working across protocols.
- Search for more detailed elements of the decoded table, in any of the columns.
- Need to be able to search for errors emitted in the Status column.
- Ability to search columns that are not part of the information carried by the protocol, such as average bit rate within a message or rms of pulse length (SENT) or time columns.
- Handling the "Click on Table Line Event".
- Handling the "Scroll Table Event".
- Handling the "Search Event".

User Interface

The search UI is made up of 2 regions, the Condition and the Actions



The condition always applies to a single column, for example the RT addresses (MIL 1553 protocol). Then the condition can be simple, without evaluation of the value. This means that the Search Action merely gets from address field to address field, without evaluating the actual value of the address. When The "Use Value" field is checked, the condition becomes more constraining and only jumps to the next RT Address field with the required value. The condition can be used on any column of any field. The jump to first and last button helps in restarting the search at the beginning or at the end of the record.

Concept of the Search

A decode table is composed of several columns of different types. Every protocol has a different combination of columns and types. Some decoders have different modes leading to a different column set for each mode.

At this stage the columns can be:

- Decimal values
- Hexadecimal values
- Floating point values
- Text.

Henceforth the Value box (needed to capture the value to search for) needs to adjust to the type. and present the appropriate box for each column. In order to be completely generic (and therefore usable for any table) the Search must be able to discover the columns type from the table.

Search in Text

This example shows the search for a RTI error (Response Time Interval) on a 1553 avionics bus. All errors appear in the Status column, and this error appears with the RTI text (see 1553 manual). Therefore the Search for these errors requires the Status column to be selected, and the RTI text to be entered as shown in the Value Box. The Value Box is labeled "text" to make sure the right type of entry is used and the text keyboard appears when this box is selected. The text search is case sensitive.

MIL1553	Type	S	RT	tr	Su	Co	Mo	P	Resp...	RT	IMG	Status	
17	BC-RT (Rcv)	1	16	0	1	1	0	4.68	µs	16	90.6	µs	
18	BC-RT (Rcv)	1	17	0	1	1	1	4.72	µs	17	85.5	µs	Error: RTI
19	BC-RT (Rcv)	1	18	0	1	1	1	4.58	µs	18	80.6	µs	
20	BC-RT (Rcv)	1	19	0	1	1	0	4.67	µs	19	75.6	µs	
21	BC-RT (Rcv)	1	20	0	1	1	1	4.69	µs	20	70.6	µs	

Search in Hexadecimal

In this case the RT Address is displayed in Hexadecimal in the table and logically requires a hexadecimal entry in the Value Box. The data entry is facilitated by the popup of the Hex keypad, in this case 0x1A. When the action arrows are pressed, the search will locate only the messages with an RT Address of 0x1a.

MIL1553	Type	S	R...	tr	S...	Co	Mo	P	Resp...	R...	IMG	
26	BC-RT (Rcv)	1	0x19	0	0x01	1	0	4.67	µs	0x19	45.5	µs
27	BC-RT (Rcv)	1	0x1a	0	0x01	1	0	4.68	µs	0x1a	40.6	µs
28	BC-RT (Rcv)	1	0x10	0	0x01	1	1	4.63	µs	0x1b	35.5	µs
29	BC-RT (Rcv)	1	0x1c	0	0x01	1	0	4.72	µs	0x1c	30.6	µs
30	BC-RT (Rcv)	1	0x1d	0	0x01	1	1	4.63	µs	0x1d	25.5	µs

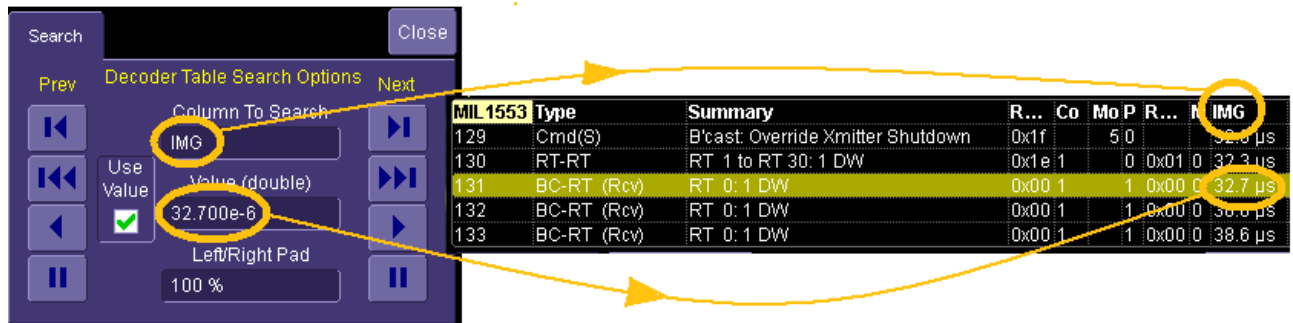
Search in Decimal

As shown in the image, we have searched the record for Transfers with a (Word) Count of 25 (decimal). Here again the numeric keypad will facilitate the entry of the value.

MIL1553	Type	Summary	R...	Co	Mo	P	R...	M
125	RT-BC (Xmit)	RT 22 to BC: 22 DW	0x16	22	1	0x16	0	
126	BC-RT (Rcv)	RT 23: 11 DW	0x17	11	0	0x17	0	
127	RT-RT	RT 25 to RT 1: 25 DW	0x0	25	0	0x19	0	
128	RT-BC (Xmit)	RT 27 to BC: 27 DW	0x1b	27	0	0x1b	0	
129	Cmd(S)	B'cast: Override Xmitter Shutdown	0x1f	5	0			

Search in Double

In the spirit of all the other types, the search for floating point values is made easy by the presentation of the numeric keypad, with prefixes (nano-, micro-, milli-, etc...). The search looks for values within 1% of the entered value.



The screenshot shows the 'Decoder Table Search Options' dialog box. The 'Column To Search' is set to 'IMG'. The 'Value (double)' is entered as '32.700e-6'. The 'Use Value' checkbox is checked. The 'Left/Right Pad' is set to '100 %'. The dialog is overlaid on a table of search results. The table has columns: MIL 1553, Type, Summary, R..., Co, Mo P, R..., and IMG. The row for MIL 1553, Type BC-RT (Rcv), Summary RT 0: 1 DW, R... 0x00, Co 1, Mo P 1, R... 0x00, and IMG 32.7 μs is highlighted in yellow. Arrows point from the search options to the corresponding columns in the table.

MIL 1553	Type	Summary	R...	Co	Mo P	R...	IMG
129	Cmd(S)	B'cast Override Xmitter Shutdown	0x1f		5 0		32.8 μs
130	RT-RT	RT 1 to RT 30: 1 DW	0x1e 1	0	0x01 0		32.3 μs
131	BC-RT (Rcv)	RT 0: 1 DW	0x00 1	1	0x00 0		32.7 μs
132	BC-RT (Rcv)	RT 0: 1 DW	0x00 1	1	0x00 0		30.6 μs
133	BC-RT (Rcv)	RT 0: 1 DW	0x00 1	1	0x00 0		38.6 μs

Known limitations

There are still 2 known limitations to this implementation. As none has been requested by customers, they are currently viewed as un-necessary, but are feasible.

- The search UI cannot express a double condition such as “Search for message with “Data = 234 when Address = 0xAA”.
- The search UI does not allow operators other than =. So it is currently not possible to “Search for message when response Time > 12e-6 s”.

At this stage, there are no other know limitations.