

Byte Pattern Matching

Local application

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A status byte is to be matched against certain valid patterns, identifying which pattern is matched and also whether no pattern is matched. A status pattern matching LA named SPAT was developed for this purpose and is described herein.

The concept is to analyze 1 status byte by comparing it against a set of up to 7 valid patterns, producing a result status byte that contains a separate bit for each pattern, and the 8th bit to indicate "none of the above." For each pattern, a match is indicated by a "1" in the result status; otherwise, the corresponding bit for that pattern is "0". This can facilitate user-friendly displays via Acnet's Basic Status property.

The parameter layout is as follows:

<i>Param</i>		<i>Size</i>	<i>Meaning</i>
ENABLE	B	2	Usual LA enable Bit#
STATUS	C	2	Status byte (in lo byte) Chan#
NPATS		2	#pattern words to follow, up to 7
PATTERNS		14	Pattern words, mask in hi byte, matching pattern in lo byte

The STATUS channel# reading field holds the raw status byte to be checked in its lo byte. It may be obtained by any means, including use of the "combined binary status word" scheme. The count of pattern parameters is NPATS, in the range 1-7. Each pattern word holds a mask in the hi byte and the pattern (against which the status byte is to be matched) in the lo byte. The mask is applied to the status byte before comparing against the pattern byte. The hi byte should be 0xFF if the entire status byte is to be compared against the pattern.

Here is the specific example that prompted this LA design. The lo 4 bits of a status word have three valid values, 0x0, 0xA, and 0xF. We need to know whether the current status matches any of these valid patterns, and if so, which one. (We also need to know if it matches none.) The matching indications are the result of the LA execution, consisting of separate bits that correspond to each of the three valid patterns scanned. If the source status channel is 0x0153, and the enable Bit# is 0x00B2, we have these parameter words:

```
00B2
0153
0003
0F00
0F0A
0F0F
```

The result status byte for the 3 valid patterns are 0x01, 0x02, 0x04. (The first pattern match is indicated in the result byte in bit #0, the second in bit #1, etc.) For any other, it is 0x80. This result byte is placed in the hi byte of the original status channel reading, where the lo byte retains the original source status. We could then see values such as the following:

```
0100      matches first valid pattern
020A      matches second valid pattern
040F      matches third valid pattern
8005      matches no valid pattern
```