AC500 V3 PLC – Selection operators
SEL, MAX, MIN, LIMIT & MUX Operators and Examples

The selection operators manipulate the input variables and return expected result.

- The SEL operator returns either input 1 or input 2 depending on the state of the Boolean select input (G).
- The MAX operator returns the highest value of the two or more inputs.
- The MIN operator returns the lowest value of the two or more inputs.
- The LIMIT operator is the combination of MAX and MIN. Here a variable has to be inside the MIN and MAX inputs if not the MIN or MAX value is returned.
- The MUX operator returns one of its inputs depending on the value of the integer select input (K).

Examples:

The screenshot above shows a simple logic in ladder diagram. On the top left the SEL operator is selecting which of the inputs is returned. As the G input is TRUE, IN1 with the value 2 is returned. The MUX operator is similar to the SEL but an integer value is used to decide, which input is returned. The MUX operator can have more than 2 inputs. The first input has the index 0. With the input 1 in K the index 1 is returned. In this example 2. If the K input is higher than the last possible index the last index is returned as shown on the top right.

The MAX and MIN operators return the maximum/minimum value of its inputs. These operators can have more than 2 inputs. The limit operator limits the input value between the minimum and maximum value. The first LIMIT has the input 3 which is inside the range 2-4, so 3 is outputted. The second LIMIT block has 5 as input which is exceeding the range. So the MAX input 4 is returned.
The same logic as shown and described above, can be found in structured text below.

```plaintext
outSel := SEL(TRUE, 4, 2);
outMux1 := MUX(1, 4, 2, 12, 8);
outMux2 := MUX(5, 4, 2, 12, 8);
outMax := MAX(4, 2);
outMin := MIN(4, 2);
outLimit1 := LIMIT(2, 3, 4);
outLimit2 := LIMIT(2, 5, 4);
```