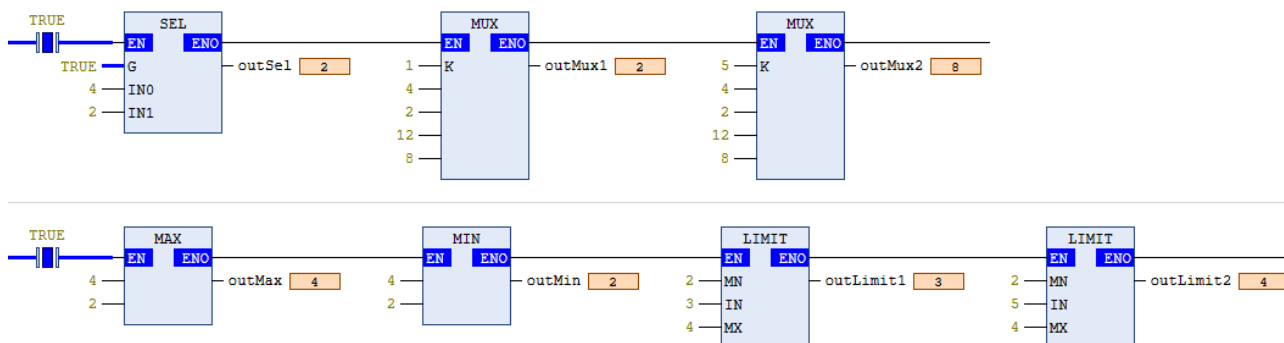—

Technical Note PLC-EOTKN114U-EN

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 on 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.

```
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);
```

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