Write a self-contained function block in 61131-3 to multiply two 4 by 4 matrices.

In IEC 61131-3, there are multiple programming languages you can use to implement a function block. In this case, I'll provide a solution using Structured Text (ST) language.

Here's a self-contained function block to multiply two 4x4 matrices:

iecst Copy code

```
FUNCTION_BLOCK MatrixMultiplication
VAR_INPUT
    Matrix1 : ARRAY [1..4, 1..4] OF REAL;
    Matrix2 : ARRAY [1..4, 1..4] OF REAL;
END_VAR

VAR_OUTPUT
    Result : ARRAY [1..4, 1..4] OF REAL;
END_VAR

METHOD Multiply : BOOL
VAR
    i, j, k : INT;
    sum : REAL;
END_VAR

FOR i := 1 TO 4 DO
    FOR j := 1 TO 4 DO
        sum := 0.0;
        FOR k := 1 TO 4 DO
            sum := sum + Matrix1[i, k] * Matrix2[k, j];
        END_FOR;
        Result[i, j] := sum;
    END_FOR;
END_FOR;

RETURN TRUE;

END_METHOD
END_FUNCTION_BLOCK
```

To use this function block, you need to create an instance of it and call the Multiply method with the input matrices:

iecst Copy code

```
PROGRAM MatrixMultiplyExample
VAR
    MatrixMult : MatrixMultiplication;
    A : ARRAY [1..4, 1..4] OF REAL := [(1, 2, 3, 4), (5, 6, 7, 8), (9, 10, 11, 12),
    B : ARRAY [1..4, 1..4] OF REAL := [(17, 18, 19
```

continue

, 20), (21, 22, 23, 24), (25, 26, 27, 28), (29, 30, 31, 32)];
C : ARRAY [1..4, 1..4] OF REAL;
END_VAR

MatrixMult.Matrix1 := A;
MatrixMult.Matrix2 := B;
IF MatrixMult.Multiply() THEN
C := MatrixMult.Result;
END_IF;
END_PROGRAM

javascript Copy code

```
In this example, the `MatrixMultiplyExample` program initializes two 4x4 matrices A
```