Defining GUD Variables for Access in uaGate 840D and dataFEED edgeConnector 840D
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1. Introduction

In the NCU numerical control unit of the Sinumerik 840D CNC controller, users can define global variables according to their requirements for individual use in the machine tool. These GUD (Global User Data) variables can be accessed with uaGate 840D and dataFEED edgeConnector 840D. This requires the definition of a corresponding structure in the associated .AWL file.

2. Structure for Defining GUD Variables in the .AWL File

The definition of a GUD variable in the .AWL file uses the following structure:

GUD_Variable:

  STRUCT
    SYNTAX_ID : BYTE := B#16#82;
    bereich_u_einheit : BYTE;
    spalte : WORD;
    zeile : WORD := W#16#1;
    bausteintyp : BYTE;
    ZEILENANZAHL : BYTE := B#16#1;
    typ : BYTE;
    laenge : BYTE;
  END_STRUCT;

Here, the individual components of this variable are defined using the following syntax:

<Component Name> : <Data Type BYTE | WORD> := <Initial Value>;

All GUD variable components have to be initialized with a value.
3. Initial Values of the GUD Variable Components

For the initialization of the individual components of a GUD variable the values according to the following description are used.

3.1 Initial Values of the Component SYNTAX_ID

The component SYNTAX_ID has always to be initialized by the value B#16#82. This value must not be changed.

3.2 Initial Values of the Component bereich_u_einheit

The component bereich_u_einheit specifies the range of validity of the GUD variable. The NCK (entire numerical controller) and Channel (one channel of the numerical controller) ranges of validity are supported.

- For defining the NCK range of validity the value B#16#1 has to be assigned.
- For defining the Channel range of validity the value B#16#41 has to be assigned.

3.3 Initial Values of the Component spalte

The component spalte specifies the line in which the GUD variable is displayed in the SINUMERIK 840D user interface.

3.4 Initial Values of the Component zeile

The component zeile has always to be initialized by the value W#16#1. This value must not be changed.

3.5 Initial Values of the Component bausteintyp

The component bausteintyp specifies the type of data block.

- For the data block SGUD the value B#16#17 has to be assigned.
- For the data block MGUD the value B#16#2D has to be assigned.
- For the data block UGUD the value B#16#2E has to be assigned.
- For the data block GUD4 the value B#16#2F has to be assigned.
- For the data block GUD5 the value B#16#30 has to be assigned.
- For the data block GUD6 the value B#16#31 has to be assigned.
- For the data block GUD7 the value B#16#32 has to be assigned.
- For the data block GUD8 the value B#16#33 has to be assigned.
- For the data block GUD9 the value B#16#34 has to be assigned.
- For the data block SGUD GD1 the value B#16#34 has to be assigned.

3.6 Initial Values of the Component ZEILENANZAHL

The component ZEILENANZAHL has always to be initialized by the value B#16#1. This value must not be changed.
3.7 Initial Values of the Component typ

The component typ specifies the datatype of the GUD variable.
- For the data type Real the value B#16#F has to be assigned.
- For the data type Char the value B#16#3 has to be assigned.
- For the data type String the value B#16#13 has to be assigned.
- For the data type Bool the value B#16#1 has to be assigned.
- For the data type Integer the value B#16#7 has to be assigned.
- For the data type Axis the value B#16#13 has to be assigned.

3.8 Initial Values of the Component laenge

The component laenge specifies the length of the GUD variable.
- For the data type Real the value B#16#8 has to be assigned as length.
- For the data type Char the value B#16#1 has to be assigned as length.
- For the data type String the string length plus 1 has to be assigned as length.
  (e.g. for a string of length 25 the value B#16#26 has to be assigned as length.)
- For the data type Bool the value B#16#1 has to be assigned as length.
- For the data type Integer the value B#16#4 has to be assigned as length.
- For the data type Axis the value B#16#4 has to be assigned as length.

4. Example of a Variable Definition

By the following structure the GUD variable SampleGUD is defined. This has a Channel range of validity, is displayed in the first line of the user interface, is a GUD5 data block and has the data type Integer.

```
SampleGUD_Variable:
  STRUCT
    SYNTAX_ID : BYTE := B#16#82;
    bereich_u_einheit : BYTE := B#16#41;
    spalte : WORD := W#16#1;
    zeile : WORD := W#16#1;
    bausteintyp : BYTE := B#16#30;
    ZEILENANZAHL : BYTE := B#16#1;
    typ : BYTE := B#16#7;
    laenge : BYTE := B#16#4;
  END_STRUCT;
```