

applications & TOOLS

System Time Conversion

SIEMENS

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User Manual

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1 System Time Conversion

1.1 Task / Functionality of the Unit

The unit contains the following functionalities:

- Conversion of a SIMOTION data type DATE_AND_TIME into a serial time (UTC time)
- Conversion of a serial time (UTC time) into the SIMOTION data type DATE_AND_TIME
- Conversion of a SIMOTION data type TIME into separate values for days, hours, minutes, seconds and milli seconds
- Conversion of a SIMOTION data type DATE into separate values for years, month and days
- Conversion a ASCII string (date / time) into the SIMOTION data type DATE_AND_TIME

1.2 Function Elements and Integration

Table 1-1: Elements and integration

Source	ConvTime	Programming language	ST
Library	LBasic	Know How Protection	No
Function / Function block program	Features / Function	Must be adapted to the application	
FBDateAndTimeToUTC	Callable in all cyclic tasks	No	
FBUTCtoDateAndTime	Callable in all cyclic tasks	No	
FBConvertTimeToInt	Callable in all cyclic tasks	No	
FBConvertDateToInt	Callable in all cyclic tasks	No	
FBConvertStringToDateAndTime	Callable in all cyclic tasks	No	

2 Program Organization Unit of the Unit

2.1 Function Block FBDateAndTimeToUTC

2.1.1 Functionality

The function block FBDateAndTimeToUTC converts a SIMOTION time delivered at the input connector 'dateTime' into a serial time of seconds. The output corresponds to the time 1. January 1970, 0:00:00 Greenwich Time. The calculation includes the time zone offset 'timeZone' as well as summertime change 'dayLight'.

In case of an invalid time target or an invalid time zone offset, the output 'error' is set 'error = TRUE' and the output 'utcTime' remains unchanged.

Features / Limitations:

Definition area of the input connector 'dateTime':

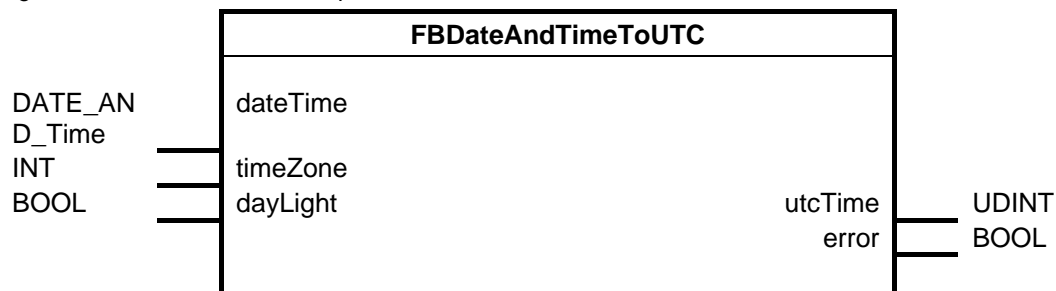
] DT#1992-02-19-13:00:00; DT#2106-02-06-18:29:15]

Definition area of the input connector 'timeZone':

] -720; 720]

2.1.2 Schematic LAD – Representation

Figure 2-1: Schematic LAD - Representation



2.1.3 Input and Output Parameters

Table 2-1: Input and output parameters

Element	P type ¹⁾	Data type	M/O ²⁾	Initial value	Description
dateTime	IN	DATE_AND_Time	M	-	Time in data type DATE_AND_TIME
timeZone	IN	INT	M	-	Time zone offset in minutes
dayLight	IN	BOOL	M	-	0: Wintertime 1: Summertime
utcTime	OUT	UDINT	-	-	Serial time
error	OUT	BOOL	-	-	Error parameterization

¹⁾ Parameter types: IN = input parameter, OUT = output parameter, IN/OUT = in / out parameter

²⁾ Parameter type: M = mandatory parameter, O = optional parameter

2.2 Function Block FBUTCtoDateAndTime

2.2.1 Functionality

The function block FBUTCtoDateAndTime calculates the date and the local time out of the number of elapsed seconds since 1. Januar 1970, 0:00:00 Greenwich Time (UTC time) and provides them in the data format DATE_AND_TIME at the output 'dateTime'.

The calculation includes the time zone offset 'timeZone' as well as the summertime change 'dayLight'. The corresponding day of the week is also provided at the output 'weekDay'.

In case of an invalid time target or an invalid time zone offset, the output 'error' is set 'error = TRUE', the outputs 'dateTime' and 'weekDay' remain unchanged.

Features / Limitations:

Definition area of the input connector 'utcTime':

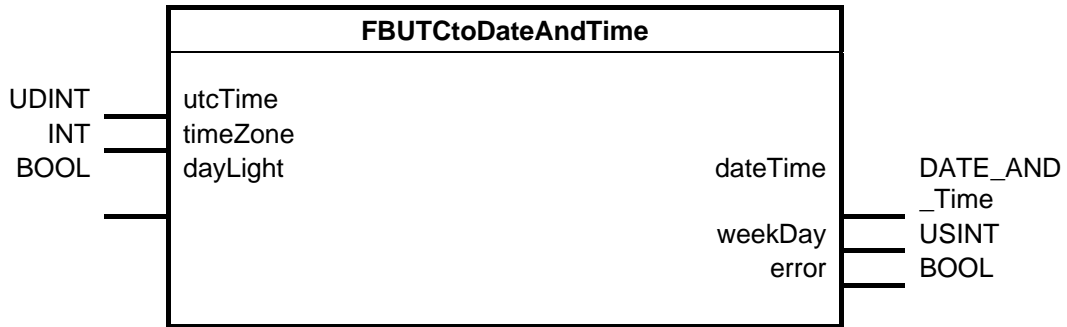
[694_224_000; 4_294_967_295]

Definition area of the input connector 'timeZone':

] -720; 720]

2.2.2 Schematic LAD – Representation

Figure 2-2: Schematic LAD - Representation



2.2.3 Input and Output Parameters

Table 2-2: Input and output parameters

Element	P type ¹⁾	Data type	M/O ²⁾	Initial value	Description
utcTime	IN	UDINT	M	-	Serial time
timeZone	IN	INT	M	-	Time zone offset in minutes
dayLight	IN	BOOL	M	-	Summertime change 0: Wintertime 1: Summertime
dateTime	OUT	DATE_AND_Time	-	-	Time in data type DATE_AND_TIME
weekDay	OUT	USINT	-	-	Day of week 1: Sunday 2: Monday ... 7: Saturday
error	OUT	BOOL	-	-	Error parameterization

¹⁾ Parameter types: IN = input parameter, OUT = output parameter, IN/OUT = in / out parameter

²⁾ Parameter type: M = mandatory parameter, O = optional parameter

2.3 Function Clock FBConvertTimeToInt

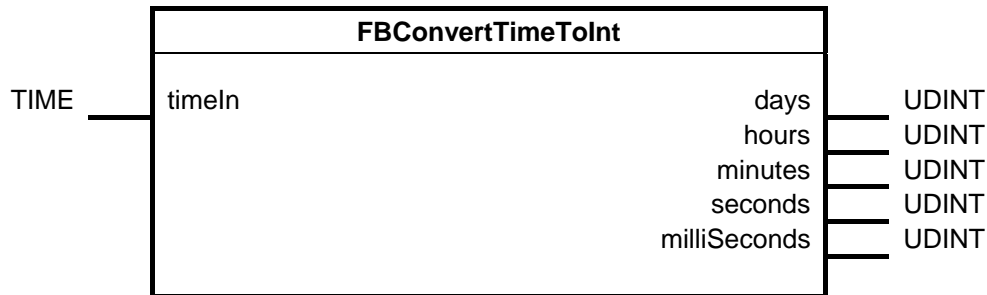
2.3.1 Functionality

The function block FBConvertTimeToInt uses a time specification in the SIMOTION format TIME to calculate the separate number of days, hours, minutes, seconds and milli seconds.

An error analysis (parameterization) is not done.

2.3.2 Schematic LAD – Representation

Figure 2-3: Schematic LAD – Representation



2.3.3 Input and Output Parameters

Table 2-3: Input and output parameters

Element	P type ¹⁾	Data type	M/O ²⁾	Initial value	Description
timeIn	IN	DATE	M	-	time specification in SIMOTION format
days	OUT	UDINT	-	-	Separate number of days
hours	OUT	UDINT	-	-	Separate number of hours
minutes	OUT	UDINT	-	-	Separate number of minutes
seconds	OUT	UDINT	-	-	Separate number of seconds
milliSeconds	OUT	UDINT	-	-	Separate number of milli seconds

¹⁾ Parameter types: IN = input parameter, OUT = output parameter, IN/OUT = in / out parameter
²⁾ Parameter type: M = mandatory parameter, O = optional parameter

2.4 Function Clock FBConvertDateToInt

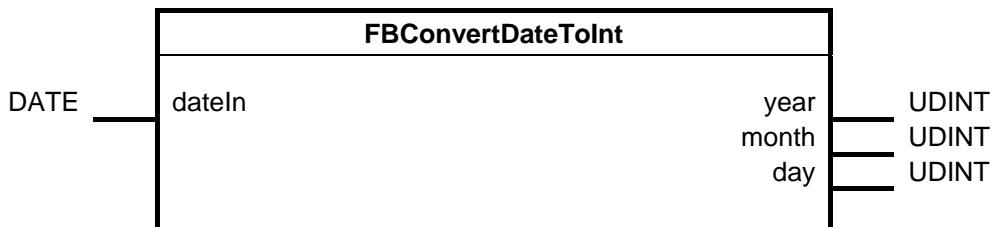
2.4.1 Functionality

The function block FBConvertDateToInt uses a date specification in the SIMOTION format DATE to calculate the separate number of years, months and days.

An error analysis (parameterization) is not done.

2.4.2 Schematic LAD – Representation

Figure 2-4: Schematic LAD – Representation



2.4.3 Input and Output Parameters

Table 2-4: Input and output parameters

Element	P type ¹⁾	Data type	M/O ²⁾	Initial value	Description
dateIn	IN	DATE	M	-	Date specification in SIMOTION format
year	OUT	UDINT	-	-	Separate number of years
month	OUT	UDINT	-	-	Separate number of month
day	OUT	UDINT	-	-	Separate number of days
¹⁾ Parameter types: IN = input parameter, OUT = output parameter, IN/OUT = in / out parameter ²⁾ Parameter type: M = mandatory parameter, O = optional parameter					

2.5 Function Block FBConvertStringToDateAndTime

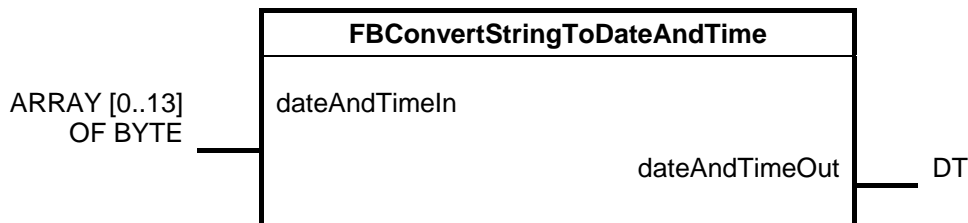
2.5.1 Functionality

The function block FBConvertStringToDateAndTime converts an ASCII string into the SIMOTION date and time format DT.

An error analysis (parameteriation) is not done.

2.5.2 Schematic LAD – Representation

Figure 2-5: Schematic LAD - Representation



2.5.3 Input and Output Paramet

Table 2-5: Input and Output Parameters

Element	P type ¹⁾	Data type	M/O ²⁾	Initial value	Description
dateAndTimeIn	IN	ARRAY [0..13] OF BYTE	M	-	Date and time specification as ASCII string
dateAndTimeOut	OUT	DT	-	-	Date and time specifiacion in SIMOTION format

¹⁾ Parameter types: IN = input parameter, OUT = output parameter, IN/OUT = in / out parameter

²⁾ Parameter type: M = mandatory parameter, O = optional parameter

User Manual

Appendix

3 Literature

Table 3-1: Literature

Nr.	Literature
1.	

4 Revision/Authors

Table 4-1: Revision/Authors

Version	Date/Author	Revision
V 1.0	21.07.2004 / XXX	First creation
V 2.0	11.04.2007 / Chr. Fecke	Adaption to SEB
V 2.1	09.08.2007 / Chr. Fecke	Changes with reference to the styleguide V3.5
V 2.2	08.02.2008 / Chr. Fecke	New functions FBConvertDateToInt and FBConvertStringToDateAndTime as well as change of name of the existing functions / adaption to SEB

5 Contact partners

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