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# Chapter 11

## USER\_VAR

### Edition 2

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## Overview

This class contains and range of Function Blocks which provide internal variables for subsequent manipulation or for intermediate data storage. A wide range of data types are supported:

Boolean, Real, Integer, Time, Time\_Of\_Day, Date\_And\_Time, Date and String

Long\_String is a special case of String in which the maximum length is increased from 80 characters to 255.

## BOOL FUNCTION BLOCK

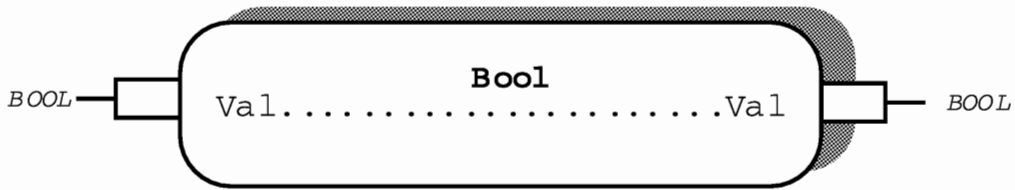


Figure 11-1 Bool Function Block Diagram

### Functional Description

The Bool function block is a user variable, which can be used for the storing of intermediate values in user programs. The boolean value is held in the Input / Output parameter, Val.

### Function Block Attributes

Type:..... 56 16  
 Class: ..... USER\_VAR  
 Default Task: ..... Task\_1  
 Short List: ..... Val  
 Memory Requirements: ..... 2 Bytes  
 Execution Time: ..... 17.2 μ Secs

### Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Val	<b>BOOL</b>	Off (0)	Oper	Oper	Senses	Off (0) On (1)

Table 11-1 Bool Function Block Diagram

## REAL FUNCTION BLOCK

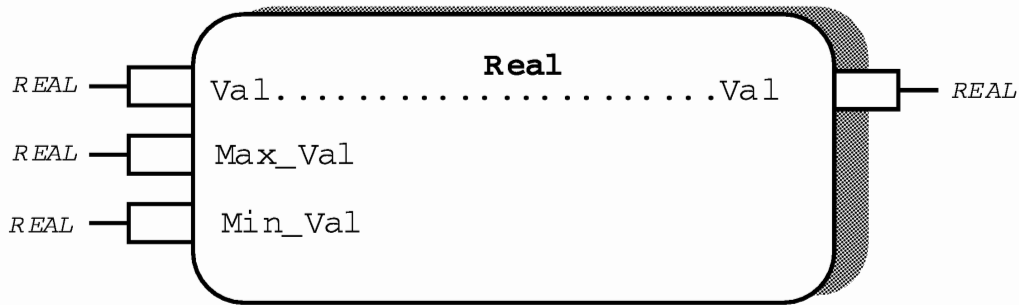


Figure 11-2 Real Function Block Diagram

### Functional Description

The Real function block is a user variable, which can be used for the definition of intermediate values in user programs. The real value is held in the Input / Output parameter Val.

The limit parameters Max\_Val and Min\_Val are used to restrict the maximum and minimum values that can be written to the function block when accessed via external serial communications.

Values written to the block via Sequential Function Charts or written from other blocks using user wiring are not restricted by the Max\_Val and Min\_Val parameters.

### Function Block Attributes

Type: .....56 32  
 Class:.....USER\_VAR  
 Default Task: .....Task\_2  
 Short List: .....Val, Max\_Val, Min\_Val  
 Memory Requirements: ..... 12 Bytes  
 Execution Time: .....19.5  $\mu$  Secs

## Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Val	<b>REAL</b>	0.0	Oper	Oper	High Limit Low Limit	Defined by Max_Val Defined by Min_Val
Max_Val	<b>REAL</b>	1000.0	Oper	Oper	High Limit Low Limit	1,000,000 Defined by Min_Val
Min_Val	<b>REAL</b>	-1000.0	Oper	Oper	High Limit Low Limit	Defined by Max_Val -1,000,000

Table 11-2 Real Function Block Diagram

## INTEGER FUNCTION BLOCK

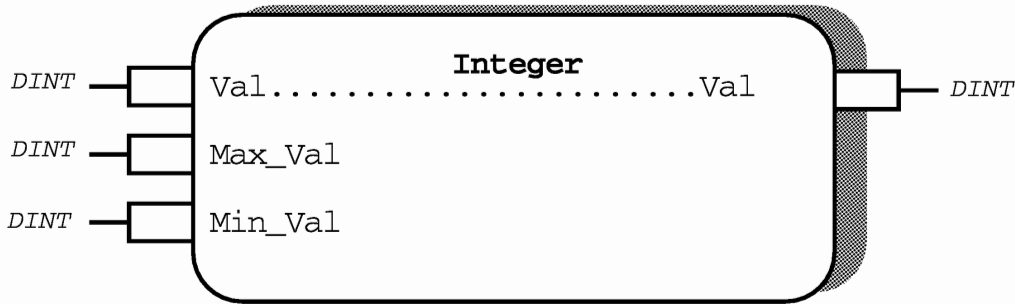


Figure 11-3 Integer Function Block Diagram

### Functional Description

The Integer function block is a user variable, which can be used for the definition of intermediate values in user programs. The integer value is held in the Input / Output parameter Val.

The limit parameters Max\_Val and Min\_Val are used to restrict the maximum and minimum values that can be written to the function block when accessed via external serial communications.

Values written to the block via Sequential Function Charts or written from other blocks using user wiring are not restricted by the Max\_Val and Min\_Val parameters.

### Function Block Attributes

Type:..... 38 30  
 Class:.....USER\_VAR  
 Default Task: ..... Task\_2  
 Short List: ..... Val, Max\_Val, Min\_Val  
 Memory Requirements: ..... 12 Bytes  
 Execution Time: ..... 19.5  $\mu$  Secs

## Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Val	<b>DINT</b>	0	Oper	Oper	High Limit Low Limit	Defined by Max_Val Defined by Min_Val
Max_Val	<b>DINT</b>	1000	Oper	Oper	High Limit Low Limit	1,000,000 Defined by Min_Val
Min_Val	<b>DINT</b>	-1000	Oper	Oper	High Limit Low Limit	Defined by Max_Val -1,000,000

Table 11-3 Integer Parameter Attributes

## TIME FUNCTION BLOCK

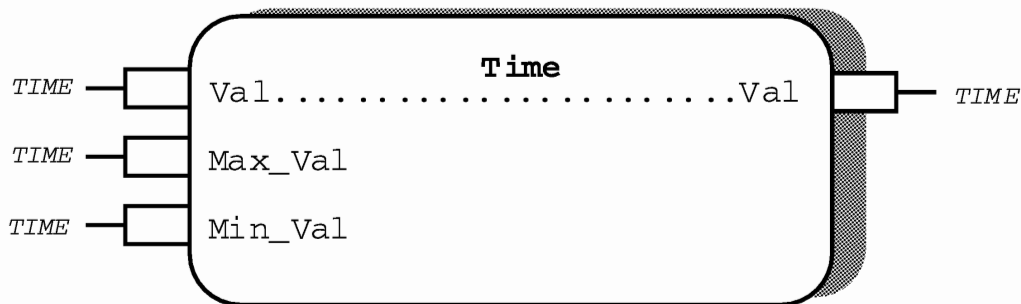


Figure 11-4 Time Function Block Diagram

### Functional Description

The Time function block is a user variable, which can be used for the definition of intermediate values in user programs. The time value is held in the Input / Output parameter Val.

The limit parameters Max\_Val and Min\_Val are used to restrict the maximum values that can be written to the function block when accessed via external serial communications.

Values written to the block via Sequential Function Charts or written from other blocks using user wiring are not restricted by the Max\_Val and Min\_Val parameters.

### Function Block Attributes

Type:..... 38 40

Class:.....USER\_VAR

Default Task: .....Task\_2

Short List: .....Val, Max\_Val, Min\_Val

Memory Requirements: ..... 12 Bytes

Execution Time: .....19.5  $\mu$  Secs



## Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Val	<b>TIME</b>	0	Oper	Oper	High Limit Low Limit	Defined by Max_Val Defined by Min_Val
Max_Val	<b>TIME</b>	1d	Oper	Oper	High Limit Low Limit	23d 23h 59m 59s Defined by Min_Val
Min_Val	<b>TIME</b>	0	Oper	Oper	High Limit Low Limit	Defined by Max_Val 0

Table 11-4 Time Parameter Attributes

## TIME\_OF\_DAY FUNCTION BLOCK

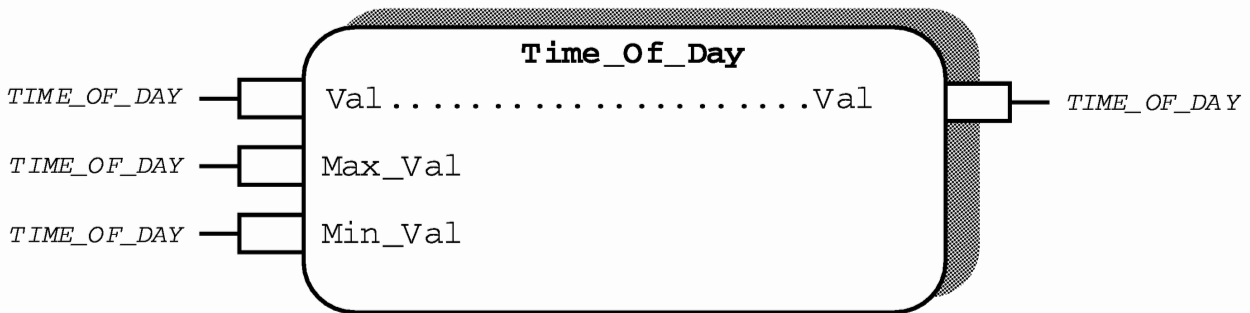


Figure 11-5 Time\_Of\_Day Function Block Diagram

### Functional Description

The Time\_Of\_Day function block is a user variable, which can be used for the definition of intermediate values in user programs. The time of day is held in the Input / Output parameter Val. The maximum limit of Val is set by Max\_Val and the minimum limit of Val is set by Min\_Val.

### Function Block Attributes

Type:..... 38 50  
 Class:.....USER\_VAR  
 Default Task: .....Task\_2  
 Short List: .....Val, Max\_Val, Min\_Val  
 Memory Requirements: ..... 12 Bytes  
 Execution Time: .....19.5μ Secs

## Parameter Attributes

<b>Name</b>	<b>Type</b>	<b>Cold Start</b>	<b>Read Access</b>	<b>Write Access</b>	<b>Type Specific Information</b>	
Val	<b>TIME_OF_DAY</b>	0	Oper	Oper	High Limit Low Limit	Defined by Max_Val Defined by Min_Val
Max_Val	<b>TIME_OF_DAY</b>	23:59:59	Oper	Oper	High Limit Low Limit	23:59:59 Defined by Min_Val
Min_Val	<b>TIME_OF_DAY</b>	0	Oper	Oper	High Limit Low Limit	Defined by Max_Val 0

Table 11-5 Time\_Of\_Day Parameter Attributes

## DATE FUNCTION BLOCK

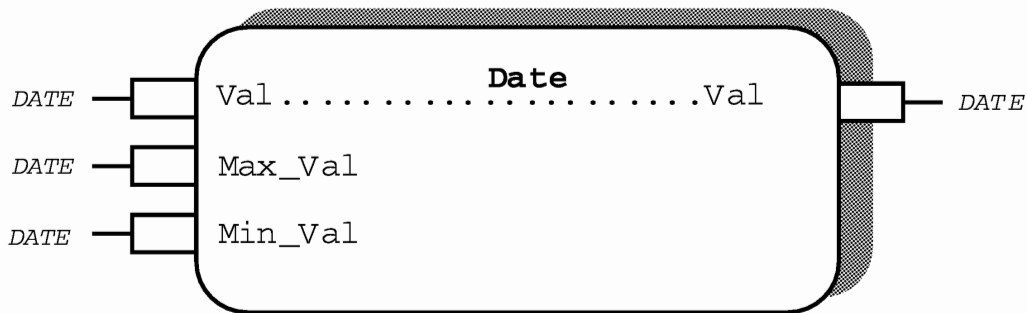


Figure 11-6 Date Function Block Diagram

### Functional Description

The Date function block is a user variable, which can be used for the definition of intermediate values in user programs. Date is held in the Input / Output parameter Val.

The limit parameters Max\_Val and Min\_Val are used to restrict the maximum and minimum block when accessed via external serial communications.

Values written to the Date block via Sequential Function Charts or written from other blocks using user wiring are not restricted by the Max\_Val and Min\_Val parameters.

### Function Block Attributes

Type:..... 38 60  
 Class:.....USER\_VAR  
 Default Task: .....Task\_2  
 Short List: .....Val, Max\_Val, Min\_Val  
 Memory Requirements; ..... 12 Bytes  
 Execution Time: .....19.5  $\mu$  Secs

## Parameter Attributes

<b>Name</b>	<b>Type</b>	<b>Cold Start</b>	<b>Read Access</b>	<b>Write Access</b>	<b>Type Specific Information</b>	
Val	<b>DATE</b>	01-Jan-1970	Oper	Oper	High Limit Low Limit	Defined by Max_Val Defined by Min_Val
Max_Val	<b>DATE</b>	31-Dec-2032	Oper	Oper	High Limit Low Limit	31-Dec-2032 Defined by Min_Val
Min_Val	<b>DATE</b>	01-Jan-1970	Oper	Oper	High Limit Low Limit	Defined by Max_Val 01-Jan-1970

Table 11-6 Date Parameter Attributes

## DATEANDTIME FUNCTION BLOCK

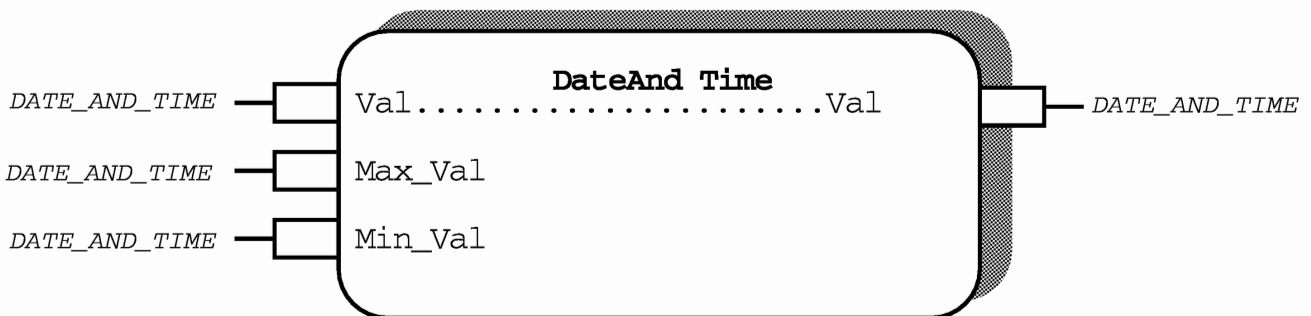


Figure 11-7 Date And Time Function Block Diagram

### Functional Description

The Date And Time function block is a user variable, which can be used to store intermediate values in user programs. The date and time is held in the Input / Output parameter Val.

The limit parameters Max\_Val and Min\_Val are used to restrict the maximum and minimum values that can be written to the Date And Time function block when accessed via external serial communications.

Values written to the block via Sequential Function Charts or written from other blocks using user wiring are not restricted by the Max\_Val and Min\_Val parameters.

### Function Block Attributes

Type:..... 38 70  
 Class:.....USER\_VAR  
 Default Task: .....Task\_2  
 Short List: .....Val  
 Memory Required:..... 12 Bytes  
 Execution Time: .....19.5 $\mu$  Secs

## Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Val	<b>DATE_AND_TIME</b>	01-Jan-1970-00:00:00	Oper	Oper	High Limit Low Limit	Defined by Max_Val Defined by Min_Val
Max_Val	<b>DATE_AND_TIME</b>	31-Dec-2032-23:59:59	Oper	Oper	High Limit Low Limit	31-Dec-2032 23:59:59 Defined by Min_Val
Min_Val	<b>DATE_AND_TIME</b>	01-Jan-1970-00:00:00	Oper	Oper	High Limit Low Limit	Defined by Max_Val 01-Jan-1970-00:00:00

Table 11-7 Date and Time Parameter Attributes

## STRING FUNCTION BLOCK

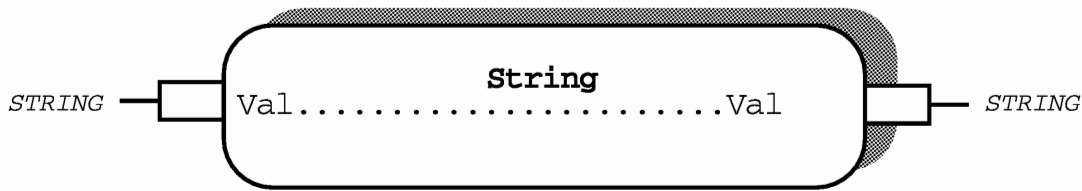


Figure 11-8 String Function Block Diagram

### Functional Description

The String function block is a user variable, which can be used for the definition of intermediate values in user programs. The string value, of up to 80 characters length, is held in the Input / Output parameter, Val.

### Function Block Attributes

- Type:..... 38 80
- Class:..... USER\_VAR
- Default Task: ..... Task\_2
- Short List: ..... Val
- Memory Requirements; ..... 82 Bytes
- Execution Time: ..... 68.2 μ Secs

### Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Val	<b>STRING</b>	' '	Oper	Oper	N/A	N/A

Table 11-8 String Parameter Attributes



### LONG\_STRING FUNCTION BLOCK

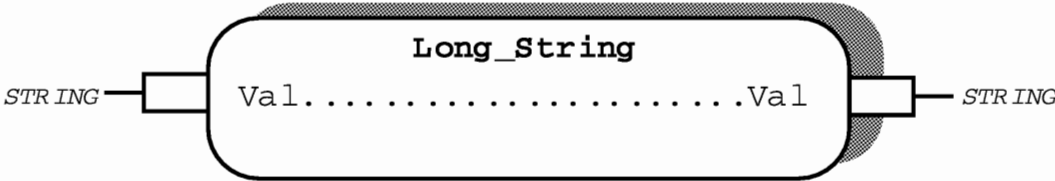


Figure 11-9 Long\_String Function Block Diagram

### Functional Description

The Long String function block is a user variable, which can be used for the definition of intermediate values in user programs. The string value, of up to 255 characters length, is held in the Input / Output parameter, Val.

### Function Block Attributes

- Type:..... 38 81
- Class: .....USER\_VAR
- Default Task: .....Task\_2
- Short List: .....Val
- Memory Requirements: .....258 Bytes

### Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Val	<b>STRING</b>	' '	Oper	Oper	N/A	N/A

Table 11-9 Long\_String Parameter Attributes