Chapter 7 Functions and function blocks

7. Functions and function blocks

The list summary of functions and functions block is described in this chapter. Please refer to Chapter 8. Basic functions and function block libraries, Chapter 9. Special function block libraries and Chapter 10. Communication function block libraries.

7.1. Function

7.1.1. Type conversion function

Convert each input data types to output data types.

Function group	Function name	Input data type	Output data type	Applied model		
				GM1~2	GM3	GM4~6
BCD_TO_***	BCD_TO_SINT	BYTE(BCD)	SINT	○	○	○
	BCD_TO_INT	WORD(BCD)	INT	○	○	○
	BCD_TO_DINT	DWORD(BCD)	DINT	○	○	○
	BCD_TO_LINT	LWORD(BCD)	LINT	○		
	BCD_TO_USINT	BYTE(BCD)	USINT	○	○	○
	BCD_TO_UINT	WORD(BCD)	UINT	○	○	○
	BCD_TO_UDINT	DWORD(BCD)	UDINT	○	○	○
	BCD_TO_ULINT	LWORD(BCD)	ULINT	○		
TRUNC	TRUNC	REAL	DINT	○		
		LREAL	LINT	○		
REAL_TO_***	REAL_TO_SINT	REAL	SINT	○		
	REAL_TO_INT	REAL	INT	○		
	REAL_TO_DINT	REAL	DINT	○		
	REAL_TO_LINT	REAL	LINT	○		
	REAL_TO_USINT	REAL	USINT	○		
	REAL_TO_UINT	REAL	UINT	○		
	REAL_TO_UDINT	REAL	UDINT	○		
	REAL_TO_ULINT	REAL	ULINT	○		
	REAL_TO_DWORD	REAL	DWORD	○		
	REAL_TO_LREAL	REAL	LREAL	○		
LREAL_TO_***	LREAL_TO_SINT	LREAL	SINT	○		
	LREAL_TO_INT	LREAL	INT	○		
	LREAL_TO_DINT	LREAL	DINT	○		
	LREAL_TO_LINT	LREAL	LINT	○		
	LREAL_TO_USINT	LREAL	USINT	○		

Function group	Function name	Input data type	Output data type	Applied model		
				GM1~2	GM3	GM4~6
LREAL_TO_***	LREAL_TO_UINT	LREAL	UINT	○		
	LREAL_TO_UDINT	LREAL	UDINT	○		
	LREAL_TO_ULINT	LREAL	ULINT	○		
	LREAL_TO_LWORD	LREAL	LWORD	○		
	LREAL_TO_REAL	LREAL	REAL	○		
SINT_TO_***	SINT_TO_INT	SINT	INT	○	○	○
	SINT_TO_DINT	SINT	DINT	○	○	○
	SINT_TO_LINT	SINT	LINT	○		
	SINT_TO_USINT	SINT	USINT	○	○	○
	SINT_TO_UINT	SINT	UINT	○	○	○
	SINT_TO_UDINT	SINT	UDINT	○	○	○
	SINT_TO_ULINT	SINT	ULINT	○		
	SINT_TO_BOOL	SINT	BOOL	○	○	○
	SINT_TO_BYTE	SINT	BYTE	○	○	○
	SINT_TO_WORD	SINT	WORD	○	○	○
	SINT_TO_DWORD	SINT	DWORD	○	○	○
	SINT_TO_LWORD	SINT	LWORD	○		
	SINT_TO_BCD	SINT	BYTE(BCD)	○	○	○
	SINT_TO_REAL	SINT	REAL	○		
	SINT_TO_LREAL	SINT	LREAL	○		
INT_TO_***	INT_TO_SINT	INT	SINT	○	○	○
	INT_TO_DINT	INT	DINT	○	○	○
	INT_TO_LINT	INT	LINT	○		
	INT_TO_USINT	INT	USINT	○	○	○
	INT_TO_UINT	INT	UINT	○	○	○
	INT_TO_UDINT	INT	UDINT	○	○	○
	INT_TO_ULINT	INT	ULINT	○		
	INT_TO_BOOL	INT	BOOL	○	○	○
	INT_TO_BYTE	INT	BYTE	○	○	○
	INT_TO_WORD	INT	WORD	○	○	○
	INT_TO_DWORD	INT	DWORD	○	○	○
	INT_TO_LWORD	INT	LWORD	○		

Function group	Function name	Input data type	Output data type	Applied model		
				GM1~2	GM3	GM4~6
INT_TO_***	INT_TO_BCD	INT	WORD(BCD)	○	○	○
	INT_TO_REAL	INT	REAL	○		
	INT_TO_LREAL	INT	LREAL	○		
DINT_TO_***	DINT_TO_SINT	DINT	SINT	○	○	○
	DINT_TO_INT	DINT	INT	○	○	○
	DINT_TO_LINT	DINT	LINT	○		
	DINT_TO_USINT	DINT	USINT	○	○	○
	DINT_TO_UINT	DINT	UINT	○	○	○
	DINT_TO_UDINT	DINT	UDINT	○	○	○
	DINT_TO_ULINT	DINT	ULINT	○		
	DINT_TO_BOOL	DINT	BOOL	○	○	○
	DINT_TO_BYTE	DINT	BYTE	○	○	○
	DINT_TO_WORD	DINT	WORD	○	○	○
	DINT_TO_DWORD	DINT	DWORD	○	○	○
	DINT_TO_LWORD	DINT	LWORD	○		
	DINT_TO_BCD	DINT	DWORD(BCD)	○	○	○
	DINT_TO_REAL	DINT	REAL	○		
	DINT_TO_LREAL	DINT	LREAL	○		
LINT_TO_***	LINT_TO_SINT	LINT	SINT	○		
	LINT_TO_INT	LINT	INT	○		
	LINT_TO_DINT	LINT	DINT	○		
	LINT_TO_USINT	LINT	USINT	○		
	LINT_TO_UINT	LINT	UINT	○		
	LINT_TO_UDINT	LINT	UDINT	○		
	LINT_TO_ULINT	LINT	ULINT	○		
	LINT_TO_BOOL	LINT	BOOL	○		
	LINT_TO_BYTE	LINT	BYTE	○		
	LINT_TO_WORD	LINT	WORD	○		
	LINT_TO_DWORD	LINT	DWORD	○		
	LINT_TO_LWORD	LINT	LWORD	○		
	LINT_TO_BCD	LINT	LWORD(BCD)	○		
	LINT_TO_REAL	LINT	REAL	○		

Function group	Function name	Input data type	Output data type	Applied model		
				GM1~2	GM3	GM4~6
LINT_TO_***	LINT_TO_LREAL	LINT	LREAL	○		
USINT_TO_***	USINT_TO_SINT	USINT	SINT	○	○	○
	USINT_TO_INT	USINT	INT	○	○	○
	USINT_TO_DINT	USINT	DINT	○	○	○
	USINT_TO_LINT	USINT	LINT	○		
	USINT_TO_UINT	USINT	UINT	○	○	○
	USINT_TO_UDINT	USINT	UDINT	○	○	○
	USINT_TO_ULINT	USINT	ULINT	○		
	USINT_TO_BOOL	USINT	BOOL	○	○	○
	USINT_TO_BYTE	USINT	BYTE	○	○	○
	USINT_TO_WORD	USINT	WORD	○	○	○
	USINT_TO_DWORD	USINT	DWORD	○	○	○
	USINT_TO_LWORD	USINT	LWORD	○		
	USINT_TO_BCD	USINT	BYTE(BCD)	○	○	○
	USINT_TO_REAL	USINT	REAL	○		
	USINT_TO_LREAL	USINT	LREAL	○		
UINT_TO_***	UINT_TO_SINT	UINT	SINT	○	○	○
	UINT_TO_INT	UINT	INT	○	○	○
	UINT_TO_DINT	UINT	DINT	○	○	○
	UINT_TO_LINT	UINT	LINT	○		
	UINT_TO_USINT	UINT	USINT	○	○	○
	UINT_TO_UDINT	UINT	UDINT	○	○	○
	UINT_TO_ULINT	UINT	ULINT	○		
	UINT_TO_BOOL	UINT	BOOL	○	○	○
	UINT_TO_BYTE	UINT	BYTE	○	○	○
	UINT_TO_WORD	UINT	WORD	○	○	○
	UINT_TO_DWORD	UINT	DWORD	○	○	○
	UINT_TO_LWORD	UINT	LWORD	○		
	UINT_TO_BCD	UINT	WORD(BCD)	○	○	○
	UINT_TO_REAL	UINT	REAL	○		
	UINT_TO_LREAL	UINT	LREAL	○		
	UINT_TO_DATE	UINT	DATE	○	○	○

Function group	Function name	Input data type	Output data type	Applied model		
				GM1~2	GM3	GM4~6
UDINT_TO_***	UDINT_TO_SINT	UDINT	SINT	○	○	○
	UDINT_TO_INT	UDINT	INT	○	○	○
	UDINT_TO_DINT	UDINT	DINT	○	○	○
	UDINT_TO_LINT	UDINT	LINT	○		
	UDINT_TO_USINT	UDINT	USINT	○	○	○
	UDINT_TO_UINT	UDINT	UINT	○	○	○
	UDINT_TO_ULINT	UDINT	ULINT	○		
	UDINT_TO_BOOL	UDINT	BOOL	○	○	○
	UDINT_TO_BYTE	UDINT	BYTE	○	○	○
	UDINT_TO_WORD	UDINT	WORD	○	○	○
	UDINT_TO_DWORD	UDINT	DWORD	○	○	○
	UDINT_TO_LWORD	UDINT	LWORD	○		
	UDINT_TO_BCD	UDINT	DWORD(BCD)	○	○	○
	UDINT_TO_REAL	UDINT	REAL	○		
	UDINT_TO_LREAL	UDINT	LREAL	○		
	UDINT_TO_TOD	UDINT	TOD	○	○	○
	UDINT_TO_TIME	UDINT	TIME	○	○	○
ULINT_TO_***	ULINT_TO_SINT	ULINT	SINT	○		
	ULINT_TO_INT	ULINT	INT	○		
	ULINT_TO_DINT	ULINT	DINT	○		
	ULINT_TO_LINT	ULINT	LINT	○		
	ULINT_TO_USINT	ULINT	USINT	○		
	ULINT_TO_UINT	ULINT	UINT	○		
	ULINT_TO_UDINT	ULINT	UDINT	○		
	ULINT_TO_BOOL	ULINT	BOOL	○		
	ULINT_TO_BYTE	ULINT	BYTE	○		
	ULINT_TO_WORD	ULINT	WORD	○		
	ULINT_TO_DWORD	ULINT	DWORD	○		
	ULINT_TO_LWORD	ULINT	LWORD	○		
	ULINT_TO_BCD	ULINT	LWORD(BCD)	○		
	ULINT_TO_REAL	ULINT	REAL	○		
	ULINT_TO_LREAL	ULINT	LREAL	○		

Function group	Function name	Input data type	Output data type	Applied model		
				GM1~2	GM3	GM4~6
BOOL_TO_***	BOOL_TO_SINT	BOOL	SINT	○	○	○
	BOOL_TO_INT	BOOL	INT	○	○	○
	BOOL_TO_DINT	BOOL	DINT	○	○	○
	BOOL_TO_LINT	BOOL	LINT	○		
	BOOL_TO_USINT	BOOL	USINT	○	○	○
	BOOL_TO_UINT	BOOL	UINT	○	○	○
	BOOL_TO_UDINT	BOOL	UDINT	○	○	○
	BOOL_TO_ULINT	BOOL	ULINT	○		
	BOOL_TO_BYTE	BOOL	BYTE	○	○	○
	BOOL_TO_WORD	BOOL	WORD	○	○	○
	BOOL_TO_DWORD	BOOL	DWORD	○	○	○
	BOOL_TO_LWORD	BOOL	LWORD	○		
	BOOL_TO_STRING	BOOL	STRING	○	○	○
BYTE_TO_***	BYTE_TO_SINT	BYTE	SINT	○	○	○
	BYTE_TO_INT	BYTE	INT	○	○	○
	BYTE_TO_DINT	BYTE	DINT	○	○	○
	BYTE_TO_LINT	BYTE	LINT	○		
	BYTE_TO_USINT	BYTE	USINT	○	○	○
	BYTE_TO_UINT	BYTE	UINT	○	○	○
	BYTE_TO_UDINT	BYTE	UDINT	○	○	○
	BYTE_TO_ULINT	BYTE	ULINT	○		
	BYTE_TO_BOOL	BYTE	BOOL	○	○	○
	BYTE_TO_WORD	BYTE	WORD	○	○	○
	BYTE_TO_DWORD	BYTE	DWORD	○	○	○
	BYTE_TO_LWORD	BYTE	LWORD	○		
	BYTE_TO_STRING	BYTE	STRING	○	○	○
WORD_TO_***	WORD_TO_SINT	WORD	SINT	○	○	○
	WORD_TO_INT	WORD	INT	○	○	○
	WORD_TO_DINT	WORD	DINT	○	○	○
	WORD_TO_LINT	WORD	LINT	○		
	WORD_TO_USINT	WORD	USINT	○	○	○
	WORD_TO_UINT	WORD	UINT	○	○	○

Function group	Function name	Input data type	Output data type	Applied model		
				GM1~2	GM3	GM4~6
WORD_TO_***	WORD_TO_UDINT	WORD	UDINT	○	○	○
	WORD_TO_ULINT	WORD	ULINT	○		
	WORD_TO_BOOL	WORD	BOOL	○	○	○
	WORD_TO_BYTE	WORD	BYTE	○	○	○
	WORD_TO_DWORD	WORD	DWORD	○	○	○
	WORD_TO_LWORD	WORD	LWORD	○		
	WORD_TO_DATE	WORD	DATE	○	○	○
	WORD_TO_STRING	WORD	STRING	○	○	○
DWORD_TO_***	DWORD_TO_SINT	DWORD	SINT	○	○	○
	DWORD_TO_INT	DWORD	INT	○	○	○
	DWORD_TO_DINT	DWORD	DINT	○	○	○
	DWORD_TO_LINT	DWORD	LINT	○		
	DWORD_TO_USINT	DWORD	USINT	○	○	○
	DWORD_TO_UINT	DWORD	UINT	○	○	○
	DWORD_TO_UDINT	DWORD	UDINT	○	○	○
	DWORD_TO_ULINT	DWORD	ULINT	○		
	DWORD_TO_BOOL	DWORD	BOOL	○	○	○
	DWORD_TO_BYTE	DWORD	BYTE	○	○	○
	DWORD_TO_WORD	DWORD	WORD	○	○	○
	DWORD_TO_LWORD	DWORD	LWORD	○		
	DWORD_TO_REAL	DWORD	REAL	○		
	DWORD_TO_TIME	DWORD	TIME	○	○	○
	DWORD_TO_TOD	DWORD	TOD	○	○	○
	DWORD_TO_STRING	DWORD	STRING	○	○	○
LWORD_TO_***	LWORD_TO_SINT	LWORD	SINT	○		
	LWORD_TO_INT	LWORD	INT	○		
	LWORD_TO_DINT	LWORD	DINT	○		
	LWORD_TO_LINT	LWORD	LINT	○		
	LWORD_TO_USINT	LWORD	USINT	○		
	LWORD_TO_UINT	LWORD	UINT	○		
	LWORD_TO_UDINT	LWORD	UDINT	○		
	LWORD_TO_ULINT	LWORD	ULINT	○		

Function group	Function name	Input data type	Output data type	Applied model		
				GM1~2	GM3	GM4~6
LWORD_TO_***	LWORD_TO_BOOL	LWORD	BOOL	○		
	LWORD_TO_BYTE	LWORD	BYTE	○		
	LWORD_TO_WORD	LWORD	WORD	○		
	LWORD_TO_DWORD	LWORD	DWORD	○		
	LWORD_TO_LREAL	LWORD	LREAL	○		
	LWORD_TO_DT	LWORD	DT	○		
	LWORD_TO_STRING	LWORD	STRING	○		
STRING_TO_***	STRING _TO_SINT	STRING	SINT	○	○	○
	STRING _TO_INT	STRING	INT	○	○	○
	STRING _TO_DINT	STRING	DINT	○	○	○
	STRING _TO_LINT	STRING	LINT	○		
	STRING _TO_USINT	STRING	USINT	○	○	○
	STRING _TO_UINT	STRING	UINT	○	○	○
	STRING _TO_UDINT	STRING	UDINT	○	○	○
	STRING _TO_ULINT	STRING	ULINT	○		
	STRING _TO_BOOL	STRING	BOOL	○	○	○
	STRING _TO_BYTE	STRING	BYTE	○	○	○
	STRING _TO_WORD	STRING	WORD	○	○	○
	STRING _TO_DWORD	STRING	DWORD	○	○	○
	STRING _TO_LWORD	STRING	LWORD	○		
	STRING _TO_REAL	STRING	REAL	○		
	STRING _TO_LREAL	STRING	LREAL	○		
	STRING _TO_DT	STRING	DT	○	○	○
	STRING _TO_DATE	STRING	DATE	○	○	○
	STRING _TO_TOD	STRING	TOD	○	○	○
	STRING _TO_TIME	STRING	TIME	○	○	○
NUM_TO_STRING	NUM_TO_STRING	ANY_NUM	STRING	○	○	○
TIME_TO_***	TIME_TO_UDINT	TIME	UDINT	○	○	○
	TIME_TO_DWORD	TIME	DWORD	○	○	○
	TIME_TO_STRING	TIME	STRING	○	○	○
DATE_TO_***	DATE_TO_UINT	DATE	UINT	○	○	○
	DATE_TO_WORD	DATE	WORD	○	○	○
	DATE_TO_STRING	DATE	STRING	○	○	○

Function group	Function name	Input data type	Output data type	Applied model		
				GM1~2	GM3	GM4~6
TOD_TO_***	TOD_TO_UDINT	TOD	UDINT	○	○	○
	TOD_TO_DWORD	TOD	DWORD	○	○	○
	TOD_TO_STRING	TOD	STRING	○	○	○
DT_TO_***	DT_TO_LWORD	DT	LWORD	○		
	DT_TO_DATE	DT	DATE	○	○	○
	DT_TO_TOD	DT	TOD	○	○	○
	DT_TO_STRING	DT	STRING	○	○	○

7.1.2. Numerical operation function

7.1.2.1. Numerical operation function with single input

Supported only at GM1 and GM2(GM3, GM4, GM5 and GM6 supports ABS.)

No.	Function name	Description
	General functions	
1	ABS	Absolute value operation
2	SQRT	Square root operation
	Log functions	
3	LN	Natural logarithm operation
4	LOG	Logarithm base to 10 operation
5	EXP	Natural Exponential
	Trigonal functions	
6	SIN	Sine of input in radians
7	COS	Cosine in radians
8	TAN	Tangent in radians
9	ASIN	Arc Sine value operation
10	ACOS	Arc Cosine value operation
11	ATAN	Arc Tangent value operation

7.1.2.2. Basic numerical operation function

EXPT is restricted to GM1 and GM2.

No.	Function name	Description
	Operation functions, which can extend the input number(but, n shall be OK to 8)	
1	ADD	Adds from 2 to n numbers (OUT <= IN1 + IN2 + ... + INn)
2	MUL	Multiples from 2 to n numbers (OUT <= IN1 * IN2 * ... * INn)
	Operation function with constant input number	
3	SUB	Performs the subtraction operation on 2 numbers (OUT <= IN1 - IN2)
4	DIV	Performs the division operation and (OUT <= IN1 / IN2)
6	MOD	Performs the division operation and returns the remainder (OUT <= IN1 Modulo IN2)
10	EXPT	Exponentiation (OUT <= $IN1^{IN2}$)
11	MOVE	Data copy (OUT <= IN)

7.1.3. Bit function

7.1.3.1. Bit shift function

No.	Function name	Description
1	SHL	OUT : = IN left-shifted by N bits (zero-filled on right)
2	SHR	OUT : = IN right-shifted by N bits (Zero-filled on left)
3	ROL	OUT : = IN left-rotated by N bits, circular
4	ROR	OUT : = IN right-rotated by N bits, circular

7.1.3.2. Bit operation function

No.	Function name	Description (n shall be ok to 8)
1	AND	Logical AND(OUT : = IN1 AND IN2 AND ... AND INn)
2	OR	Logical OR(OUT : = IN1 OR IN2 OR ... OR INn)
3	XOR	Logical exclusive OR(OUT : = IN1 XOR IN2 XOR ... XOR INn)
4	NOT	Logical inversion(OUT : = NOT IN1)

7.1.4. Selection function

No.	Function name	Description (n shall be ok to 8)
1	SEL	Output(Selected input between IN0 or IN1)
2	MAX	Output put max. value among IN1,...INn
3	MIN	Output put min. value among IN1,...INn
4	LIMIT	Outputs the upper or lower limit orf input
5	MUX	Outputs Kth input among IN0,…INn

7.1.5. Comparison function

No.	Function name	Description (n shall be OK to 8)
1	GT	'Greater than' comparison OUT : = (IN1>IN2) & (IN2>IN3) & ... & (INn-1 > INn)
2	GE	'Greater than equal' comparison OUT : = (IN1>=IN2) & (IN2>=IN3) & ... & (INn-1 >= INn)
3	EQ	'Equal' comparison OUT : = (IN1=IN2) & (IN2=IN3) & ... & (INn-1 = INn)
4	LE	'Less than or equal' comparison OUT : = (IN1<=IN2) & (IN2<=IN3) & ... & (INn-1 <= INn)
5	LT	'Less than' comparison OUT : = (IN1<IN2) & (IN2<IN3) & ... & (INn-1 < INn)
6	NE	'Not equal' comparison OUT : = (IN1<>IN2) & (IN2<>IN3) & ... & (INn-1 <> INn)

7.1.6. Character function

No.	Function name	Description
1	LEN	Character string length
2	LEFT	Leftmost L characters of IN
3	RIGHT	Rightmost L characters of IN
4	MID	L character of IN, beginning at the p-th
5	CONCAT	Extensible concatenation
6	INSERT	Insert IN2 into IN1 after the p-th character position
7	DELETE	Delete L characters of IN, beginning at the p-th character position
8	REPLACE	Replace L characters of IN1 by IN2, starting at the p-th character position
9	FIND	Find the character position of the beginning of the first occurrence of IN2 in IN1, if no occurrence of IN2 is found, then OUT : = 0

7.1.7. Functions of time data types

No.	Function name	Description
	Operation and concatenation functions	
1	ADD_TIME	Adds TIME to TIME, TOD or DT
2	SUB_TIME	Subtracts TIME from TIME, TOD or DT
	SUB_DATE	Subtracts DATE from DATE, result is TIME
	SUB_TOD	Subtracts TOD from TOD, result is TIME
	SUB_DT	Subtracts DT from DT, result is TIME
3	MUL_TIME	Multiply the TIME by number
4	DIV_TIME	Divide the TIME by number
5	CONCAT_TIME	Concatenates DATE and TOD to DT

7.1.8. System control function

No.	Function name	Description
1	DI	Task program operation prohibit
2	EI	Task program operation allow
3	STOP	Operation stop by program
4	ESTOP	Emergency stop by program
5	DIREC_IN	Instant refresh of input data (applicable in GM1-GM4, GM6)
6	DIREC_IN5	Instant refresh of input data (applicable in GM5)
7	DIREC_O	Instant refresh of output data (applicable in GM1-GM4, GM6)
8	DIREC_O5	Instant refresh of output data (applicable in GM5)
9	WDT_RST	Watch_Dog Timer reset

7.2. MK(MASTER-K) function libraries

No.	Function name	Description (n shall be below than 8)
1	ENCO_B,W,D,L	Outputs the most high ON bit position
2	DECO_B,W,D,L	Sets the assigned bit position to 1
3	BSUM_B,W,D,L	Outputs the number of ON bits
4	SEG	Converts BCD or HEX value to 7 segment display code
5	BMOV_B,W,D,L	Copy and move some part of bit strings
6	INC_B,W,D,L	Increases IN data
7	DEC_B,W,D,L	Decreases IN data

7.3. Function blocks

7.3.1. Bistable function block

No.	Function block name	Description
1	SR	Set priority bistable output
2	RS	Reset priority bistable output
3	SEMA	Semaphore for system resource control

7.3.2. Edge detection function block

No.	Function block name	Description
1	R_TRIG	Rising Edge Detector
2	F_TRIG	Falling Edge Detector

7.3.3. Counter function block

No.	Function block name	Description
1	CTU	Up Counter
2	CTD	Down Counter
3	CTUD	Up Down Counter

7.3.4. Timer function block

No.	Function block name	Description
1	TP	Pulse Timer
2	TON	On-Delay Timer
3	TOF	Off-Delay Timer

7.4. Analog function blocks(For special module only)

7.4.1. A/D function block

No.	GM3		GM4		GM6	Description
	Local	Remote	Local	Remote	Local	
1	AD4INI	ADR4INI	AD2INI	ADR2INI	AD2INI	Module initialization
2	AD4ARD	ADR4RD	AD2ARD	ADR2RD	AD2ARD	A/D converting value reading(Array type)
3	AD4RD	-	AD2RD	-	AD2RD	A/D converting value reading(Stand-alone type)

7.4.2. A/T(Analog Timer) function block

No.	GM3		GM4		Description
	Local	Remote	Local	Remote	
1	AT4TON	-	AT3TON	-	Activates analog timer

7.4.3. D/A function block

No.	GM3		GM4		GM6	Description
	Local	Remote	Local	Remote	Local	
1	DA4INI	DAR4INI	DA1INI	DAR1INI	-	Module initialization
2	DA4AWR	DAR4WR	DA1AWR	DAR1WR	DA1AWR	Digital data writing(Array type)
3	DA4WR	-	DA1WR	-	DA1WR	Digital data writing(Stand-alone type)

7.4.4. T/C(Thermo-Couple) function block

No.	GM3		GM4		Description
	Local	Remote	Local	Remote	
1	TC4INI	TCR4INI	TC2INI	TCR2INI	Module initialization
2	TC4ARD	TCR4RD	TC2ARD	TCR2RD	Temperature conversion value reading (Array type)
3	TC4RD	-	TC2RD	-	Temperature conversion value reading (Stand-alone type)

7.4.5. RTD(Resistor Temperature Detection) function block

No.	GM3		GM4		Description
	Local	Remote	Local	Remote	
1	RTD3INI	RTDR3INI	RTD2INI	RTDR2INI	Module initialization
2	RTD3ARD	RTDR3RD	RTD2ARD	RTDR2RD	RTD temperature conversion value reading (Array type)
3	RTD3RD	-	RTD2RD	-	RTD temperature conversion value reading (Stand-alone type)

7.4.6. PID function block

No.	GM3		GM4		Description
	Local	Remote	Local	Remote	
1	PID5INI	-	PID3INI	-	Module initialization
2	PID5ARD	-	PID3ARD	-	PID operation value reading(Array type)
3	PID5RD	-	PID3RD	-	PID operation value reading(Stand-alone type)

7.4.7. High-speed counter function block

No.	GM3		GM4		GM6	Description
	Local	Remote	Local	Remote	Local	
1	HSC_CMP	HSCR1CMP	HSC_CMP	HSCR0CMP	HSC_CMP	Module comparison value selection
2	HSC_PRE	HSCR1PRE	HSC_PRE	HSCR1PRE	HSC_PRE	Module Preset value selection
3	HSC_WR	HSCR1WR	HSC_WR	HSCR0WR	HSC_WR	Output information selection
4	HSC_RD	HSCR1RD	HSC_RD	HSCR0RD	HSC_RD	Input information selection

7.4.8. Position control(Analog output) function block

No.	GM3		GM4		Description
	Local	Remote	Local	Remote	
1	POSA_AST	-	-	-	General automatic positioning operation instruction
2	POSA_CRD	-	-	-	Current operation status reading
3	POSA_EMG	-	-	-	Emergency stop instruction
4	POSA_FLT	-	-	-	Movable zero point set instruction
5	POSA_JOG	-	-	-	JOG operation instruction
6	POSA_MOF	-	-	-	M code off instruction
7	POSA_NM	-	-	-	Next move operation instruction
8	POSA_OR	-	-	-	Override operation instruction
9	POSA_ORG	-	-	-	Zero point return instruction
10	POSA_RES	-	-	-	Error reset instruction
11	POSA_RTP	-	-	-	Position retrieval instruction before manual operation
12	POSA_SMC	-	-	-	Operation data number change instruction
13	POSA_SRD	-	-	-	Current operation status bit reading
14	POSA_TEA	-	-	-	Position teaching instruction
15	POSA_TMP	-	-	-	Deceleration stop instruction
16	POSA_TPB	-	-	-	Teaching playback instruction
17	POSA_VCG	-	-	-	Speed change instruction
18	POSA_VLT	-	-	-	Speed teaching instruction

7.4.9. Position control(Pulse output) function block

No.	GM3		GM4		Description
	Local	Remote	Local	Remote	
1	POSP_AST	-	POSP_AST	-	General automatic positioning operation instruction
2	POSP_CRD	-	POSP_CRD	-	Current operation status reading
3	POSP_EMG		POSP_EMG		Emergency stop instruction
4	POSP_FLT	-	POSP_FLT	-	Movable zero point set instruction
5	POSP_INC	-	POSP_INC	-	Inching operation instruction
6	POSP_INT	-	-	-	Interpolation instruction
7	POSP_JOG	-	POSP_JOG	-	JOG operation instruction
8	POSP_MOF	-	POSP_MOF	-	M Code off instruction
9	POSP_MPG	-	-	-	Manual pulse generator enable instruction
10	POSP_NM	-	POSP_NM	-	Next move operation instruction
11	POSP_OFF		POSP_OFF		Output prohibit release instruction
12	POSP_OR	-	POSP_OR	-	Override operation instruction
13	POSP_ORG	-	POSP_ORG	-	Zero point return instruction
14	POSP_PRE	-	POSP_PRE	-	Current position preset instruction
15	POSP_RES	-	POSP_RES	-	Error reset instruction
16	POSP_RTP	-	POSP_RTP	-	Position return instruction before the manual operation
17	POSP_SMC	-	POSP_SMC	-	Operation data number change instruction
18	POSP_SRD	-	POSP_SRD	-	Current operation status bit reading
19	POSP_TEA	-	POSP_TEA	-	Position teaching instruction
20	POSP_TMP	-	POSP_TMP	-	Deceleration stop instruction
21	POSP_VCG	-	POSP_VCG	-	Speed change instruction
22	POSP_VLT	-	POSP_VLT	-	Speed Teaching instruction

7.5. Communication function blocks

No.	Function block name	Description
1	CONNECT	Establishes logical communication channel between self-station and other station (only for Mini_MAP)
2	RDARRAY	Reading array type data from other station
3	RDBLOCK	Reading the block data from other station (Max. 450 Bytes)
4	RDTYPE(BOOL...DT)	Reading data from other station
5	STATUS	Reading status of other station
6	WRARRAY	Writing the array type data to other station
7	WRBLOCK	Writing block data to other station (Max. 450 Bytes)
8	WRTYPE(BOOL...DT)	Writing data to other station

7.6. Computer communication module function blocks

No.	Function block name	Description
1	SND_MSG	Sending the defined frame data to other station
8	RCV_MSG	Receiving data from other station