MELSOFT LIBRARY QD65PD2 REFERENCE MANUAL

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Reference Manual Revision History

Reference Manual Number	Date	Description
FBM-M035-A	2010/10/31	First edition

1.M+QD65PD2_RingCounterSetting (Ring counter setting)

FB Name

M+QD65PD2_RingCounterSetting

Item	Description			
Function overview	Sets the ring counter upper limit and lower limit.			
Symbol	M+QD65PD2_RingCounterSetting			
	Execution command — B : FB_EN FB_ENO : B Execution status			
	Module start XY address — W : i_Start_IO_No FB_OK : B — Completed without error			
	Target CH — W : i_CH			
	Ring counter upper limit — D : i_RingUpperLimit ERROR_ID : W Error code			
	Ring counter lower limit — D : i_RingLowerLimit			
Applicable hardware	Compatible hardware: QD65PD2			
and software	Hardware details:			
	Q series * Basic model			
	High performance model			
	Universal model			
	*Not applicable for QCPU (A mode)			
	Compatible software: GX Works2 Ver1.31H or later			
Programming	Ladder			
language				
Number of steps	For universal model CPU: 136*			
(maximum value)	*The value is the number of steps in the label program, and is therefore stated as a			
	reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple			
	Project).			
Function description	•When FB_EN (Execution command) is turned ON, the preset ring counter lower and			
	upper values are stored in the buffer memory. To reflect the preset upper and lower			
	values, turn OFF and then ON the operating condition settings batch-change command (Y			
	signal) or count enable command (Y signal).			
	•FB operation is one-shot only, triggered by the FB_EN signal.			
	•When the target CH setting value is out of range, the FB_ERROR output turns ON,			
	processing is interrupted, and the error code is stored in ERROR_ID (Error code).			
	Refer to the error code explanation section for details.			

Item	Description			
Compiling method	Macro type			
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do			
	not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop, etc. because it is impossible to turn OFF.			
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of			
	the target CH.			
	5) This FB uses index registers Z9, Z8, Z7, and Z6. Please do not use these index registers			
	in an interrupt program.			
	6) Every input must be provided with a value for proper FB operation.			
	7) If the parameter is set using the configuration function of GX Works 2, using this FB is			
	8) Perform settings using the GX Works2 intelligent function module switch setting to match			
	systems and devices connected to the QD65PD2.			
	For details on how to use the intelligent function module switch setting, refer to GX			
	Works2 Operating Manual (Common).			
FB operation type	Pulsed execution (1 scan execution type)			
Application example	Refer to Appendix 1 - Application examples			
Timing chart	Operation of I/O signals			
	[When operation completes without error] [When an error occurs]			
	FB_EN (Execution command)			
	FB_ENO (Execution status)			
	Ring counter value write processing No processing Write No processing Ring counter value write processing			
	FB_OK (Completed without error)			
	FB_ERROR (Error flag)			
	ERROR ID (Error code) 0 ERROR ID (Error code) 0 Error code			
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual			

Error codes

Error code list

Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

■Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No	W	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the QD65PD2
				module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	W	1~2	Specify the CH number.
Ring counter upper	i_RingUpperLimit	D	-2,147,483,648~	Specify the ring counter
limit			2,147,483,647	upper limit.
Ring counter lower	i_RingLowerLimit	D	-2,147,483,648~	Specify the ring counter
limit			2,147,483,647	lower limit.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates that the settings of
error				ring counter upper and lower values are
				completed.
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_RingCounterSetting function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

2.M+QD65PD2_CountEnable (Count enable)

FB Name

M+QD65PD2_CountEnable

Item	Description			
Function overview	Performs count operation (count start/stop).			
Symbol		M+QD65PD2_CountEnable		
	Execution command — B :	FB_EN FB_ENO : B Execution status		
	Module start XY address — W	i_Start_IO_No o_CountStart : B Count operation flag		
	Target CH —— W	i_CH FB_ERROR : B Error flag		
		ERROR_ID : W —— Error code		
Applicable hardware	Compatible hardware: QD65P	02		
and software	Hardware details:			
	Q series *	Basic model		
		High performance model		
	Universal model			
	*Not applicable for QCPU (A mode)			
	Compatible software: GX Works2 Ver1.31H or later			
Programming	Ladder			
language				
Number of steps	For universal model CPU: 115*			
(maximum value)	*The value is the number of steps in the label program, and is therefore stated as a			
	reference value. For details, r	efer to the GX Works2 Version1 Operation Manual (Simple		
	Project).			
Function description	•By turning ON/OFF FB_EN (Execution command), the count enable (Y signal) is turned ON/OFF			
	•When the target CH setting value is out of range, the FB_ERROR output turns ON			
	processing is interrupted, and the error code is stored in ERROR ID (Error code).			
	Refer to the error code explanation section for details.			
Compiling method	Macro type			

Item	Description				
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery				
precautions	processing separately in accordance with the required system operation.				
	2) The FB cannot be used in an interrupt program.				
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do				
	not use this FB in programs that are only executed once such as a subroutine,				
	FOR-NEXT loop, etc. because it is impossible to turn OFF.				
	4) This FB uses index registers Z9 and Z8. Please do not use these index registers in an				
	interrupt program.				
	5) Every input must be provided with a value for proper FB operation.				
	6) When this FB is used in two or more places, a duplicated coil warning will occur during				
	compile operation due to the Y signal being operated by index modification. However this				
	is not a problem and the FB will operate without error.				
	7) Perform settings using the GX Works2 intelligent function module switch setting to match				
	systems and devices connected to the QD65PD2.				
	For details on how to use the intelligent function module switch setting, refer to GX				
	Works2 Operating Manual (Common).				
FB operation type	Real-time execution				
Application example	Refer to Appendix 1 - Application examples				
Timing chart	•Operation of I/O signals				
	[When operation completes without error] [When an error occurs]				
	FB_EN (Execution command)				
	FB_ENO (Execution status) FB_ENO (Execution status)				
	Count enable command (Y signal)				
	o_CountStart (Count operation flag)				
	FB_ERROR (Error flag) FB_ERROR (Error flag)				
	ERROR_ID (Error code) 0 Error code 0 Error code				
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual				

Error codes

Error code list

Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

■Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No	W	Depends on the I/O	Specify the starting XY
address			point range. For details,	address (in hexadecimal)
			refer to the CPU user's	where the QD65PD2
			manual.	module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	W	1~2	Specify the CH number.

Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Counter operation	o_CountStart	В	OFF	ON: Count enable command (Y signal) is
flag				ON.
				OFF: Count enable command (Y signal) is
				OFF.
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_CountEnable function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

3.M+QD65PD2_PresentValueStorage (Present value monitoring)

FB Name

M+QD65PD2_PresentValueStorage

Item	Description			
Function overview	Monitors the present value.			
Symbol	M+QD65PD2_PresentValueStorage			
	Execution command — B :	FB_EN FB_ENO : B Execution status		
	Module start XY address — W	: i_Start_IO_No FB_OK : B Completed without error		
	Target CHW	: i_CH o_PresentValue : D Present value		
		FB_ERROR : B — Error flag		
		ERROR_ID : W —— Error code		
Applicable hardware	Compatible hardware: QD65PD2			
and software	Hardware details:			
	Q series *	Basic model		
		High performance model		
		Universal model		
	*Not applicable for QCPU (A n	node)		
	Compatible software: GX Wor	ks2 Ver1.31H or later		
Programming	Ladder			
language				
Number of steps	For universal model CPU: 103	*		
(maximum value)	*The value is the number of steps in the label program, and is therefore stated as a			
	reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple			
	Project).			
Function description	•When FB_EN (Execution command) is turned ON, the present value is read from the			
	buffer memory.			
	•When the target CH setting v	alue is out of range, the FB_ERROR output turns ON,		
	processing is interrupted, and	the error code is stored in ERROR_ID (Error code).		
	Refer to the error code explanation section for details.			
Compiling method	Macro type			

Item	Description			
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do			
	not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop, etc. because it is impossible to turn OFF.			
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of			
	the target CH.			
	5) This FB uses index registers Z9, Z8 and Z7. Please do not use these index registers in			
	an interrupt program.			
	6) Every input must be provided with a value for proper FB operation.			
	7) Perform settings using the GX Works2 intelligent function module switch setting to match			
	systems and devices connected to the QD65PD2.			
	For details on how to use the intelligent function module switch setting, refer to GX			
	Works2 Operating Manual (Common).			
FB operation type	Real-time execution			
Application example	Refer to Appendix 1 - Application examples			
Timing chart	•Operation of I/O signals			
	[When operation completes without error] [When an error occurs]			
	FB_EN (Execution command)			
	FB_ENO (Execution status)			
	o.PresentValue (Present value) Refreshing Refreshing o.PresentValue (Present value) Refreshing stop (Present value)			
	FB_OK (Completed without error)			
	FB_ERROR (Error flag)			
	ERROR JD (Error code) 0 ERROR JD (Error code) 0 Error code			
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual			

Error codes	
Error code list	
Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

■ Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No	W	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the QD65PD2
				module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	W	1~2	Specify the CH number.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates that the present value
error				is being read.
Present value	o_PresentValue	D	0	Store the present value.
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_PresentValueStorage function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

4.M+QD65PD2_SetCoincidenceOutput (Coincidence output function setting)

FB Name

M+QD65PD2_SetCoincidenceOutput

Item	Description			
Function overview	Sets a coincidence output point and performs coincidence output reset.			
Symbol		M+QD65PD2_SetCoin	cidenceOutput	
	Execution command —	B : FB_EN	FB_ENO : B-	Execution status
	Module start XY address —	—W : i_Start_IO_No	FB_OK : B—	— Completed without error
	Point setting (coincidence output 1)-	— D : i_SetPoint_No1	FB_ERROR : B-	— Error flag
	Point setting (coincidence output 2)-	D : i_SetPoint_No2	ERROR_ID : W	Error code
	Point setting (coincidence output 3)-	D : i_SetPoint_No3		
	Point setting (coincidence output 4)-	D : i_SetPoint_No4		
	Point setting (coincidence output 5) -	D : i_SetPoint_No5		
	Point setting (coincidence output 6) -	D : i_SetPoint_No6		
	Point setting (coincidence output 7)-	D : i_SetPoint_No7		
	Point setting (coincidence output 8) -	D : i_SetPoint_No8		
Applicable hardware	Compatible hardware: QD65PI	02		
and software	Hardware details:	Hardware details:		
	Q series *	Basic model		
		High performance mo	odel	
		Universal model		
	*Not applicable for QCPU (A m	ode)		
	Compatible software: GX Work	s2 Ver1.31H or later		
Programming	Ladder			
language				
Number of steps	For universal model CPU: 209	÷		
(maximum value)	*The value is the number of ste	eps in the label program	n, and is therefor	re stated as a
	reference value. For details, r	efer to the GX Works2	Version1 Operat	tion Manual (Simple
	Project).			

Item	Description
Function description	•By turning ON FB_EN (Execution command), i_SetPoint (Point setting (coincidence output
	n)) is reflected in the QD65PD2 and the reset command (coincidence output n) (Y signal) is
	turned ON. When the coincidence output n (X signal) is turned OFF, the reset command
	(coincidence output n) (Y signal) is turned OFF. (n indicates 1 to 8.)
	•The coincidence output and external coincidence output are turned ON again even if the
	coincidence output and external coincidence output are reset with this FB while the present
	value is the coincidence output point setting.
	•This FB performs for the channel that has been assigned with the channel assignment
	setting.
	•FB operation is one-shot only, triggered by the FB_EN signal.
Compiling method	Macro type
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery
precautions	processing separately in accordance with the required system operation.
	2) The FB cannot be used in an interrupt program.
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program.
	Do not use this FB in programs that are only executed once such as a subroutine,
	FOR-NEXT loop, etc. because it is impossible to turn OFF.
	4) This FB uses index registers Z9 and Z8. Please do not use these index registers in an
	interrupt program.
	5) Every input must be provided with a value for proper FB operation.
	6) Set the coincidence output condition setting (buffer memory) for 00b: coincidence output
	when using the FB.
	7) The intelligent function module switch setting needs to be set when executing the
	coincidence output function with this FB. For details, refer to the user's manual.
	8) Perform settings using the GX Works2 intelligent function module switch setting to match
	systems and devices connected to the QD65PD2.
	For details on how to use the intelligent function module switch setting, refer to GX
	Works2 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to Appendix 1 - Application examples

Item	Description
Timing chart	Operation of I/O signals [When operation completes without error] FB_EN (Execution command) FB_ENO (Execution statua) Point setting (coincidence output No.1) (buffer memory) Setting change request (coincidence output 1 (X signal) Reset command (coincidence output 1) (Y signal) FB_OK (Completed without error) FB_ERROR (Error flag) ERRORID (Error code)
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual

Error codes	
Error code list	
Error code	Description
None	None

■Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No	W	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the QD65PD2
				module is mounted. (For
				example, enter H10 for
				X10.)
Point setting	i_SetPoint1	D	-2,147,483,648~	Specify the coincidence
(coincidence output			2,147,483,647	output No.1 point setting
1)				value.
Point setting	i_SetPoint2	D	-2,147,483,648~	Specify the coincidence
(coincidence output			2,147,483,647	output No.2 point setting
2)				value.

Name	Variable name	Data	Setting range	Description
		type		
Point setting	i_SetPoint3	D	-2,147,483,648~	Specify the coincidence
(coincidence output			2,147,483,647	output No.3 point setting
3)				value.
Point setting	i_SetPoint4	D	-2,147,483,648~	Specify the coincidence
(coincidence output			2,147,483,647	output No.4 point setting
4)				value.
Point setting	i_SetPoint5	D	-2,147,483,648~	Specify the coincidence
(coincidence output			2,147,483,647	output No.5 point setting
5)				value.
Point setting	i_SetPoint6	D	-2,147,483,648~	Specify the coincidence
(coincidence output			2,147,483,647	output No.6 point setting
6)				value.
Point setting	i_SetPoint7	D	-2,147,483,648~	Specify the coincidence
(coincidence output			2,147,483,647	output No.7 point setting
7)				value.
Point setting	i_SetPoint8	D	-2,147,483,648~	Specify the coincidence
(coincidence output			2,147,483,647	output No.8 point setting
8)				value.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates that the coincidence
error				output has been reset.
Error flag	FB_ERROR	В	OFF	Always OFF
Error code	ERROR_ID	W	0	Always 0

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_SetCoincidenceOutput function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

5.M+QD65PD2_Preset (Preset/replace)

FB Name

M+QD65PD2_Preset

Item	Description					
Function overview	Performs preset/replace of the	Performs preset/replace of the present value.				
Symbol	M+QD65PD2_Preset					
	Execution command ——B	FB_EN	FB_ENO : B	—— Execution status		
	Module start XY address ——W	: i_Start_IO_No	FB_OK : B	—— Completed without error		
	Target CH ——W	: i_CH	FB_ERROR : B	—— Error flag		
	Preset/replace value — D	i_PresetValue	ERROR_ID : W	—— Error code		
Applicable hardware	Compatible hardware: QD65F	PD2				
and software	Hardware details:					
	Q series *	Basic model				
		High performa	nce model			
		Universal mod	el			
	*Not applicable for QCPU (A mode)					
	Compatible software: GX Works2 Ver1.31H or later					
Programming	Ladder					
language						
Number of steps	For universal model CPU: 149*					
(maximum value)	*The value is the number of s	teps in the label p	program, and is th	herefore stated as a		
	reference value. For details, Project)	refer to the GX W	/orks2 Version1 (Operation Manual (Simple		
Function description	•By turning ON FB EN (Exec	ution command).	i PresetValue (F	Preset/replace value) is set		
	for the preset/replace value s	setting (buffer me	mory), the prese	t/replace is performed, and		
	the present/replace value of	the counter is rev	vritten.	• • •		
	•FB operation is one-shot onl	y, triggered by the	FB_EN signal.			
	•When the target CH setting v	alue is out of ran	ge, the FB_ERR	OR output turns ON,		
	processing is interrupted, an	d the error code is	s stored in ERRO	DR_ID (Error code).		
	Refer to the error code expla	nation section for	r details.			
Compiling method	Macro type					

Item	Description				
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery				
precautions	processing separately in accordance with the required system operation.				
	2) The FB cannot be used in an interrupt program.				
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do				
	not use this FB in programs that are only executed once such as a subroutine,				
	FOR-NEXT loop, etc. because it is impossible to turn OFF.				
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target CH.				
	5) This FB uses index registers Z9, Z8, Z7, and Z6. Please do not use these index registers				
	in an interrupt program.				
	6) Every input must be provided with a value for proper FB operation.				
	7) The preset/replace is not performed by the phase Z input terminal with this FB.				
	8) When this FB is used in two or more places, a duplicated coil warning will occur during				
	compile operation due to the Y signal being operated by index modification. However this				
	is not a problem and the FB will operate without error.				
	9) Perform settings using the GX Works2 intelligent function module switch setting to match				
	systems and devices connected to the QD65PD2.				
	For details on how to use the intelligent function module switch setting, refer to GX				
	Works2 Operating Manual (Common).				
FB operation type	Pulsed execution (1 scan execution type)				
Application example	Refer to Appendix 1 - Application examples				
Timing chart	•Operation of I/O signals				
	[When operation completes without error] [When an error occurs]				
	FB_EN (Execution command)				
	FB_ENO (Execution status)				
	Preset/replace value (buffer memory) No processing New value Preset/replace value (buffer memory) No setting				
	Preset/replace command (Y signal)				
	Present value Present value Present value Present value Present value (buffer memory)				
	FB_OK (Completed without error)				
	FB_ERROR (Error flag) FB_ERROR (Error flag)				
	ERROR ID (Error code) 0 Error code 0 Error code				
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual				

Error codes

Error code list

Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

Labels

Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No	W	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the QD65PD2
				module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	W	1~2	Specify the CH number.
Preset/replace value	i_PresetValue	D	-2,147,483,648~	Specify the preset/replace
			2,147,483,647	value.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates that preset/replace
error				command (Y signal) is ON.
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_Preset function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

6.M+QD65PD2_LatchCounterOperation (Latch counter function operation)

FB Name

M+QD65PD2_LatchCounterOperation

Item	Description			
Function overview	Executes latch counter function.			
Symbol	M+QD65PD2 LatchCounterOperation			
	Execution command — B	: FB FN	FB ENO B	Execution status
	Medule start XV address			
			FB_UK.B	Completed without error
	Target CH — W	/:i_CH	o_LatchCount : D-	— Latch count value
			FB_ERROR : B	— Error flag
			ERROR_ID : W	— Error code
	L			
Applicable hardware	Compatible hardware: QD65F	PD2		
and software	Hardware details:			
	Q series *	Basic model		
		High performar	ice model	
		Universal mode	el	
	*Not applicable for QCPU (A mode)			
	Compatible software: GX Wor	rks2 Ver1.31H or l	ater	
Programming	Ladder			
language				
Number of steps	For universal model CPU: 190*			
(maximum value)	*The value is the number of s	teps in the label p	rogram, and is there	efore stated as a
	reference value. For details,	refer to the GX W	orks2 Version1 Ope	eration Manual (Simple
	Project).			
Function description	•By turning ON FB_EN (Exec	cution command), f	the count value, wh	ich has been latched by
	the latch counter function, is	stored in o_Latch	Count (Latch count	value).
	•FB operation is one-shot onl	y, triggered by the	FB_EN signal.	
	•When the target CH setting v	value is out of rang	ge, the FB_ERROR	output turns ON,
	processing is interrupted, an	d the error code is	stored in ERROR_	ID (Error code).
	Refer to the error code expla	anation section for	details.	
Compiling method	Macro type			

Item	Description				
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery				
precautions	processing separately in accordance with the required system operation.				
	2) The FB cannot be used in an interrupt program.				
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do				
	not use this FB in programs that are only executed once such as a subroutine,				
	FOR-NEXT loop, etc. because it is impossible to turn OFF.				
	4) Turn OFF the selected counter function start command (Y signal) when using the FB.				
	When the signal is ON, the latch counter function of the target channel will not be				
	executed.				
	5) When two or more of these FBs are used, precaution must be taken to avoid repetition of				
	the target CH.				
	6) This FB uses index registers Z9, Z8, Z7, and Z6. Please do not use these index registers				
	in an interrupt program.				
	7) Every input must be provided with a value for proper FB operation.				
	8) The intelligent function module switch setting needs to be set when executing the latch				
	counter function. For details, refer to the user's manual.				
	9) When this FB is used in two or more places, a duplicated coil warning will occur during				
	compile operation due to the Y signal being operated by index modification. However this				
	is not a problem and the FB will operate without error.				
	10) Perform settings using the GX Works2 intelligent function module switch setting to match				
	systems and devices connected to the QD65PD2.				
	For details on how to use the intelligent function module switch setting, refer to GX				
	Works2 Operating Manual (Common).				
FB operation type	Pulsed execution (multiple scan execution type)				
Application example	Refer to Appendix 1 - Application examples				
Timing chart	•Operation of I/O signals				
	[When operation completes without error] [When an error occurs]				
	FB_EN (Execution command)				
	FB_ENO (Execution status)				
	Selected counter function start command (Y signal) Selected counter function start command (Y signal)				
	Latch count value update flag (buffer memory)				
	Latch count value update flag reset command (buffer memory) 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
	o_Latch Count (Latch count value) No setting Latch count value O_Latch Count (Latch count value) No setting No setting				
	FB_OK (Completed without error)				
	FB_ERROR (Error flag)				
	ERROR ID (Error code) 0 ERROR ID (Error code) 0 Error code 0				

Item	Description
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual

Error codes	
Error code list	
Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

■Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No	W	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the QD65PD2
				module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	W	1~2	Specify the CH number.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates that the latch counter
error				function is completed.
Latch count value	o_LatchCount	D	0	Store the count value that has been latched.
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_LatchCounterOperation function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

7.M+QD65PD2_SamplingOperation (Sampling counter function operation)

FB Name

M+QD65PD2_SamplingOperation

Item	Description				
Function overview	Executes sampling counter function.				
Symbol	M+QD65PD2_SamplingOperation				
	Execution command —	B : FB_EN FB_ENO : B Execution status			
	Module start XY address —	W : i_Start_IO_No FB_OK : B Completed without error			
	Target CH—	W : i_CH o_SamplingCount : D Sampling count value			
	Time unit setting (sampling counter) —	W : i_SetUnitTime FB_ERROR : B Error flag			
	Cycle setting (sampling counter)—	W : i_SamplingTime ERROR_ID : W Error code			
Applicable hardware	Compatible hardware: QD65PI	02			
and software	Hardware details:				
	Q series *	Basic model			
		High performance model			
		Universal model			
	*Not applicable for QCPU (A mode)				
	Compatible software: GX Works2 Ver1.31H or later				
Programming	Ladder				
language					
Number of steps	For universal model CPU: 231*				
(maximum value)	*The value is the number of steps in the label program, and is therefore stated as a				
	reference value. For details, re	efer to the GX Works2 Version1 Operation Manual (Simple			
	Project).				
Function description	•By turning ON FB_EN (Execu	tion command), the sampling count is started with the preset			
	i_SetUnitTime (Time unit setti	ng (sampling counter)) and i_SamplingTime (Cycle setting			
	(sampling counter)) and the sa	ampling count value is read from the buffer memory.			
	•When the sampling time has e	elapsed, FB_OK (Completed without error) is turned ON and			
	the processing ends.				
	•When the target CH setting va	lue is out of range, the FB_ERROR output turns ON,			
	processing is interrupted, and	the error code is stored in ERROR_ID (Error code).			
	Refer to the error code explan	ation section for details.			
Compiling method	Macro type				

Item	Description
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery
precautions	processing separately in accordance with the required system operation.
	2) The FB cannot be used in an interrupt program.
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do
	not use this FB in programs that are only executed once such as a subroutine,
	FOR-NEXT loop, etc. because it is impossible to turn OFF.
	4) Turn OFF the selected counter function start command (Y signal) when using this FB.
	When it is turned ON, the sampling counter function of the corresponding channel is not
	performed.
	5) When two or more of these FBs are used, precaution must be taken to avoid repetition of
	the target CH.
	6) This FB uses index registers Z9, Z8, Z7, and Z6. Please do not use these index registers
	in an interrupt program.
	7) Every input must be provided with a value for proper FB operation.
	8) The intelligent function module switch setting needs to be set when executing the
	sampling counter function. For details, refer to the user's manual.
	9) When this FB is used in two or more places, a duplicated coil warning will occur during
	compile operation due to the Y signal being operated by index modification. However this
	is not a problem and the FB will operate without error.
	10) Perform settings using the GX Works2 intelligent function module switch setting to match
	systems and devices connected to the QD65PD2.
	For details on how to use the intelligent function module switch setting, refer to GX
	Works2 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to Appendix 1 - Application examples

Item	Description				
Timing chart	•Operation of I/O signals				
	[When operation completes without error] [When an error occurs]				
	FB_EN (Execution command) FB_EN (Execution command) FB_EN (Execution status) Time unit setting (sampling counter/periodic pulse counter) (buffer memory) Cycle setting (sampling counter/periodic pulse counter) (buffer memory) Setting value Setting change request (sampling counter) Setting value (Sampling counter) 0 Setting change request (sampling counter) Refreshing (Sampling counter/periodic pulse counter function start command) No setting Sampling counter/periodic pulse counter operation flag (buffer memory) Selected counter function start command (Y signal) Sampling count value 0 Sampling count value 0				
	Sampling count value update flag reset command (buffer memory) FB_OK (Completed without error) FB_DCK (Completed without error) FB_DCK (Completed without error) FB_DCK (Completed without error) FB_DCK (Completed without error) FB_DCK (Completed without error)				
	PB_ERROR (Error tag) FB_ERROR (Error tag) ERROR ID (Error code) 0 ERROR ID (Error code) 0				
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual				

Error codes	
Error code list	
Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

■ Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No	W	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the QD65PD2
				module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	W	1~2	Specify the CH number.

Name	Variable name	Data	Setting range	Description
		type		
Time unit setting	i_SetUnitTime	W	0: 1 ms	Specify the unit for the
(sampling counter)			1: 10 ms	sampling operation time.
Cycle setting	i_SamplingTime	W	1~65,535 *1	Set the sampling time.
(sampling counter)				When the time unit setting
				(sampling counter) is set
				to 1: 10 ms, the setting
				range is 10 ~ 655350 ms
				*1: Setting method
				•1~32,767: Set in decimal.
				•32,768~65,535: Set after
				converted into
				hexadecimal.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates that the execution of
error				the sampling counter function is completed.
Sampling count	o_SamplingCount	D	0	Store the sampling count value.
value				
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_SamplingOperation function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

8.M+QD65PD2_PeriodicPulseCounter (Periodic pulse counter function operation)

FB Name

M+QD65PD2_PeriodicPulseCounter

Item	Description			
Function overview	Executes periodic pulse counter function.			
Symbol	M+QD65PD2_PeriodicPulseCounter			
	Execution command ——	B : FB_EN FB_ENO : B Execution status		
	Module start XY address —	W : i_Start_IO_No FB_OK : B Completed without error		
	Target CH ——	W : i_CH o_DifferenceValue : D Periodic pulse count, difference value		
	Time unit setting (periodic pulse counter)	W : i_SetUnitTime o_PresentValue : D Periodic pulse count, present value		
	Cycle setting (periodic pulse counter) —	W : i_PeriodTime FB_ERROR : B Error flag		
		ERROR_ID : W —— Error code		
Applicable bardware	Compatible bardware: OD650			
Applicable hardware	Compatible nardware: QD65PD2			
	Haroware details:			
		Basic model		
	Viet appliable for OCDU (A mode)			
	Not applicable for QCPU (A mode)			
Des serversie e	Compatible software: GX Works2 Ver1.31H or later			
Programming	Ladder			
language				
Number of steps		· · · · · · · · · · · · · · · · · · ·		
(maximum value)	*The value is the number of steps in the label program, and is therefore stated as a			
	reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple			
	Project).			
Function description	•By turning ON FB_EN (Execution command), the periodic pulse count is started with the			
	preset i_PeriodTime (Cycle setting (periodic pulse counter)), and the periodic pulse count			
	present value and periodic pulse count difference value are read from the buffer memory.			
	•When the target CH setting value is out of range, the FB_ERROR output turns ON,			
	processing is interrupted, and the error code is stored in ERROR_ID (Error code).			
	Refer to the error code explanation section for details.			
Compiling method	Macro type			

Item	Description				
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery				
precautions	processing separately in accordance with the required system operation.				
	2) The FB cannot be used in an interrupt program.				
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do				
	not use this FB in programs that are only executed once such as a subroutine,				
	FOR-NEXT loop, etc. because it is impossible to turn OFF.				
	4) Turn OFF the selected counter function start command (Y signal) when using the FB.				
	5) When two or more of these FBs are used, precaution must be taken to avoid repetition of				
	the target CH.				
	6) This FB uses index registers Z9, Z8, Z7, and Z6. Please do not use these index registers				
	in an interrupt program.				
	7) Every input must be provided with a value for proper FB operation.				
	8) The intelligent function module switch setting needs to be set when executing the periodic				
	pulse counter function. For details, refer to the user's manual.				
	9) When this FB is used in two or more places, a duplicated coil warning will occur during				
	compile operation due to the Y signal being operated by index modification. However this				
	is not a problem and the FB will operate without error.				
	10) Perform settings using the GX Works2 intelligent function module switch setting to match				
	systems and devices connected to the QD65PD2.				
	For details on how to use the intelligent function module switch setting, refer to GX				
	Works2 Operating Manual (Common).				
FB operation type	Pulsed execution (multiple scan execution type)				
Application example	Refer to Appendix 1 - Application examples				
Timing chart	•Operation of I/O signals				
	[When operation completes without error] [When an error occurs]				
	FB_EN (Execution command)				
	FB_ENO (Execution status)				
	counter/periodic pulse counter/buffer memory) Cvcle setting (sampling				
	counter/periodic pulse counter/periodic pulse				
	Setting change request (sampling counter) (buffer memory) 0				
	Selected counter function start command (Y signal)				
	o PresentVal (Periodic pulse count, present value) No Refreshing Refreshing Perfereshing pulse count, present value) No Refreshing Perfereshing Perf				
	o DifferenceVal (Periodic pulse count, difference value) Refreshing Refreshing difference value) No Befreshing No DifferenceVal				
	Gompleted without error)				
	FB_ERROR (Error flag)				
	ERROR ID (Error code) 0 Error code 0				
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual				

Error codes

Error code list

Error code	Description	
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2	
	Please try again after confirming the setting.	

Labels

■Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No	W	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the QD65PD2
				module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	W	1~2	Specify the CH number.
Time unit setting	i_SetUnitTime	W	0: 1ms	Set the unit for the periodic
(periodic pulse			1: 10ms	time.
counter)				
Cycle setting	i_PeriodTime	W	1~65,535 *1	Set periodic time setting.
(periodic pulse				When the time unit setting
counter)				(periodic pulse counter) is
				set to 1: 10 ms, the setting
				range is 10 ~ 655350 ms.
				*1: Setting method
				•1~32,767: Set in decimal.
				•32,768~65,535: Set after
				converted into
				hexadecimal.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates that the periodic pulse
error				counter function is being performed.
Periodic pulse count,	o_DifferenceVal	D	0	Store the periodic pulse difference count
difference value				value.
Periodic pulse count,	o_PresentVal	D	0	Store the present value of when the periodic
present value				time has elapsed.
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_PeriodicPulseCounter function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.
9.M+QD65PD2_FrequencyMeasure (Frequency measurement)

FB Name

M+QD65PD2_FrequencyMeasure

Item	Description		
Function overview	Starts the frequency measurement function and reads the measured frequency value that		
	has been calculated.		
Symbol		M+QD65PD2_FrequencyMeasure	
	Execution command	B : FB_EN FB_ENO : B Execution status	
	Module start XY address	W : i_Start_IO_No FB_OK : B Completed without error	
	Target CH	W : i_CH o_FrequencyVal : D Measured frequency value	
	Time unit setting (frequency measurement)	W : i_SetUnitTime FB_ERROR : B Error flag	
	Moving average count (frequency measurement)	W : i_SetAverage ERROR_ID : W Error code	
Applicable hardware	Compatible hardware: QD65PE)2	
and software	Hardware details:		
	Q series *	Basic model	
		High performance model	
		Universal model	
	*Not applicable for QCPU (A mode)		
	Compatible software: GX Works2 Ver1.31H or later		
Programming	Ladder		
language			
Number of steps	For universal model CPU: 185*		
(maximum value)	*The value is the number of steps in the label program, and is therefore stated as a		
	reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple		
	Project).		
Function description	•By turning ON FB_EN (Execution command), the frequency measurement function is		
	executed with the preset i_SetUnitTime (Time unit setting (frequency measurement)) and		
	i_SetAverage (Moving average count (frequency measurement)), and the measured		
	frequency value is read from the buffer memory.		
	•When the target CH setting value is out of range, the FB_ERROR output turns ON,		
	processing is interrupted, and	the error code is stored in ERROR_ID (Error code).	
	Refer to the error code explan	ation section for details.	
Compiling method	Macro type		

Item	Description		
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery		
precautions	processing separately in accordance with the required system operation.		
	2) The FB cannot be used in an interrupt proc	gram.	
	3) Please ensure that the FB_EN signal is ca	pable of being turned OFF by the program. Do	
	not use this FB in programs that are only e	executed once such as a subroutine,	
	FOR-NEXT loop, etc. because it is imposs	ible to turn OFF.	
	4) When two or more of these FBs are used,	precaution must be taken to avoid repetition of	
	the target CH.		
	5) This FB uses index registers Z9, Z8, Z7, ar	nd Z6. Please do not use these index registers	
	in an interrupt program.		
	6) Every input must be provided with a value	for proper FB operation.	
	7) The intelligent function module switch setting	ng needs to be set when executing the	
	frequency measurement function. For deta	ils, refer to the user's manual.	
	8) When this FB is used in two or more places	s, a duplicated coil warning will occur during	
	compile operation due to the Y signal being	g operated by index modification. However this	
	is not a problem and the FB will operate wi	ithout error.	
	9) Perform settings using the GX Works2 intelligent function module switch setting to match		
	systems and devices connected to the QD65PD2.		
	For details on how to use the intelligent fur	nction module switch setting, refer to GX	
	Works2 Operating Manual (Common).		
FB operation type	Real-time execution		
Application example	Refer to Appendix 1 - Application examples		
Timing chart	 Operation of I/O signals 		
	[When operation completes without error]	[When an error occurs]	
	FB_EN (Execution command)	FB_EN (Execution command)	
	FB_ENO(Execution status)	FB_ENO (Execution status)	
	Time unit setting (frequency measurement) (buffer memory)	I me unit setting (frequency measurement) (buffer memory) No setting	
	Moving average count (frequency measurement) (buffer memory)	Moving average count (frequency measurement) (buffer memory)	
	Count enable command (Y signal)	Count enable command (Y signal)	
	Measured frequency value (o_FrequencyVal)	Measured frequency value No Refreshing	
	Measured frequency value update flag (buffer memory)	Measured frequency value update flag (buffer memory)	
	Measured frequency value update flag reset command (buffer memory)	Measured frequency value update flag reset command (buffer memory)	
	Frequency measurement flag (buffer memory) 1 0	Frequency measurement 0 flag (buffer memory)	
	FB_OK (Completed without error)	FB_OK (Completed without error)	
	FB_ERROR (Error flag)	FB_ERROR (Error flag)	
	ERROR JD (Error code) 0	ERROR_ID (Error code)	

Item	Description
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual

Error codes	
Error code list	
Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No	W	Depends on the I/O	Specify the starting XY
address			point range. For details,	address (in hexadecimal)
			refer to the CPU user's	where the QD65PD2
			manual.	module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	W	1~2	Specify the CH number.
Time unit setting	i_SetUnitTime	W	0: 0.01s	Specify the unit time for the
(frequency			1: 0.1s	frequency measurement.
measurement)			2: 1s	
Moving average	i_SetAverage	W	1~100	Specify the moving average
count (frequency				count for the frequency
measurement)				measurement.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates the frequency is being
error				measured.

Name	Variable name	Data	Initial	Description
		type	value	
Measured frequency	o_FrequencyVal	D	0	Store the measured frequency value.
value				
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_FrequencyMeasure function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

10.M+QD65PD2_RotationSpeedMeasure (Rotation speed measurement)

FB Name

M+QD65PD2_RotationSpeedMeasure

Item	Description		
Function overview	Starts the rotation speed measurement function and reads the measured rotation speed		
	value that has been calculated		
Symbol		M+QD65PD2_RotationSpeedMeasure	
	Execution comma	and — B : FB_EN FB_ENO : B — Execution status	
	Module start XY addr	ess — W : i_Start_IO_No FB_OK : B — Completed without error	
	Target	CH — W : i_CH o_RotationVal : D — Measured rotation speed value	
	Time unit setting (rotation speed measureme	ent) —— W : i_SetUnitTime FB_ERROR : B —— Error flag	
	Moving average co (rotation speed measureme	untW : i_SetAverage ERROR_ID : W Error code	
	No. of pulses per rotat	ion — D : i_SetRotation	
Applicable hardware	Compatible hardware: QD65PI	02	
and software	Hardware details:		
	Q series *	Basic model	
		High performance model	
		Universal model	
	*Not applicable for QCPU (A mode)		
	Compatible software: GX Work	s2 Ver1.31H or later	
Programming	Ladder		
language			
Number of steps	For universal model CPU: 189'		
(maximum value)	*The value is the number of ste	eps in the label program, and is therefore stated as a	
	reference value. For details, re	efer to the GX Works2 Version1 Operation Manual (Simple	
	Project).		
Function description	•By turning ON FB_EN (Execution command), the rotation speed measurement is executed		
	with the preset i_SetUnitTime (Time unit setting (rotation speed measurement)),		
	i_SetAverage (Moving average count (rotation speed measurement)) and i_SetRotation		
	(No. of pulses per rotation), and the measured rotation speed value is read from the buffer		
	memory.		
	•vvnen the target CH setting va	alue is out of range, the FB_ERROR output turns ON,	
	processing is interrupted, and the error code is stored in ERROR_ID (Error code).		
	Reter to the error code explanation section for details.		

Item	Description	
Compiling method	Macro type	
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery	
precautions	processing separately in accordance with the required system operation.	
	2) The FB cannot be used in an interrupt program.	
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do	
	not use this FB in programs that are only executed once such as a subroutine,	
	FOR-NEXT loop, etc. because it is impossible to turn OFF.	
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of	
	the target CH.	
	5) This FB uses index registers Z9, Z8, Z7, and Z6. Please do not use these index registers	
	in an interrupt program.	
	6) Every input must be provided with a value for proper FB operation.	
	7) The intelligent function module switch setting needs to be set when executing the rotation	
	speed measurement function. For details, refer to the user's manual.	
	8) When this FB is used in two or more places, a duplicated coil warning will occur during	
	compile operation due to the Y signal being operated by index modification. However this	
	is not a problem and the FB will operate without error.	
	9) Perform settings using the GX Works2 intelligent function module switch setting to mate	
	systems and devices connected to the QD65PD2.	
	For details on how to use the intelligent function module switch setting, refer to GX	
	Works2 Operating Manual (Common).	
FB operation type	Real-time execution	
Application example	Refer to Appendix 1 - Application examples	

Item	Description	
Timing chart	•Operation of I/O signals	
	[When operation completes without error]	[When an error occurs]
	FB_EN (Execution command)	FB_EN (Execution command) FB_ENO (Execution status) Time unit setting (rotation
	No Setting Setting (buffer memory) No Setting (buffer memory) No Setting No. of pulses per rotation No Setting value	speed measurement No setting (buffer memory) Moving average count (rotation speed measurement) (buffer memory) No. of pulses per rotation
	(buffer memory) Count enable command (Y signal)	(buffer memory) No setting Count enable command
	Measured rotation speed value (o_Rotation Val) Measured rotation speed	Measured rotation speed value (o_RotationVal) No Refreshing Measured rotation speed
	value update flag (buffer memory) Measured rotation speed value update flag reset command (buffer memory) 0 1 0 1 0 1 0 1 0 0 1 0 0 0 0 0 0 0 0	value update flag (buffer 0 memory) Measured rotation speed value update flag reset 0 command (buffer memory)
	Rotation speed measurement flag (buffer memory)	Rotation speed measurement flag (buffer memory)
	(Completed without error)	FB_DK (Completed without error) FB_ERROR (Error flag)
	ERROR_JD (Error code)	ERRORJD (Error code) 0 Error code 0
Relevant manual	Q series QD65PD2 multifunction counter/time	r module user's manual

Error codes	
Error code list	
Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No	W	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the QD65PD2
				module is mounted. (For
				example, enter H10 for
				X10.)

Name	Variable name	Data	Setting range	Description
		type		
Target CH	i_CH	W	1~2	Specify the CH number.
Time unit setting	i_SetUnitTime	W	0: 0.01s	Set the unit time for the
(rotation speed			1: 0.1s	rotation speed
measurement)			2: 1s	measurement.
Moving average	i_SetAverage	W	1~100	Set the moving average
count (rotation				count for the rotation
speed				speed measurement.
measurement)				
No. of pulses per	i_SetRotation	D	1~8,000,000	Set the number of pulses
rotation				per rotation.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates the rotation speed is
error				being measured.
Measured rotation	o_RotationVal	D	0	Store the measured rotation speed value.
speed value				
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_RotationSpeedMeasure function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

11.M+QD65PD2_PulseMeasure (Pulse measurement)

FB Name

M+QD65PD2_PulseMeasure

Item	Description			
Function overview	Starts the pulse measurement function and reads the measured pulse value.			
Symbol	Execution command — Module start XY address — Target CH — Function input terminal measurement — Latch counter input terminal measurement —	M+QD65PD2_PulseMeasure B : FB_EN FB_ENO : B W : i_Start_IO_No FB_OK : B W : i_CH o_UpdateForFUNC : B B : i_MeasureByFUNC o_ResultForFUNC : D Measured pulse value (function input) B : i_MeasureByLATCH o_UpdateForLATCH : B Carear Measured pulse value (latch counter input) B : i_MeasureByLATCH o_ResultForLATCH : D Measured pulse value (latch counter input) Measured pulse value (latch counter input) FB_ERROR : B Error flag ERROR_ID : W Error code		
Applicable hardware	Compatible hardware: QD65PI	02		
and software	Hardware details:			
	Q series *	Basic model		
		High performance model		
		Universal model		
	*Not applicable for QCPU (A m	ode)		
	Compatible software: GX Work	s2 Ver1.31H or later		
Programming	Ladder			
language				
Number of steps	For universal model CPU: 297*			
(maximum value)	*The value is the number of ste	eps in the label program, and is therefore stated as a		
	reference value. For details, re	efer to the GX Works2 Version1 Operation Manual (Simple		
	Project).			
Function description	•After the count enable command (Y signal) is turned ON when FB_EN (Execution			
	command) is turned ON, the pulse is measured by turning ON i_MeasureByFUNC			
	(Function input terminal measurement) or i_MeasureByLATCH (Latch counter input			
	terminal measurement).			
	•When the target CH setting va	alue is out of range, the FB_ERROR output turns ON,		
	processing is interrupted, and	the error code is stored in ERROR_ID (Error code).		
	Refer to the error code explan	ation section for details.		
Compiling method	Macro type			

Item	Description
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery
precautions	processing separately in accordance with the required system operation.
	2) The FB cannot be used in an interrupt program.
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do
	not use this FB in programs that are only executed once such as a subroutine,
	FOR-NEXT loop, etc. because it is impossible to turn OFF.
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of
	5) This FB uses index registers 29, 28, 27, and 26. Please do not use these index registers
	in an interrupt program.
	6) Every input must be provided with a value for proper FB operation.
	7) The intelligent function module switch setting needs to be set when executing the pulse
	measurement function. For details, refer to the user's manual.
	8) When this FB is used in two or more places, a duplicated coil warning will occur during
	compile operation due to the Y signal being operated by index modification. However this
	is not a problem and the FB will operate without error.
	9) If the measurement interval for the target measurement is smaller than the scan time,
	measurement may not be performed normally. Please adjust the measurement interval so
	that it is more than double the scan time.
	10) Perform settings using the GX Works2 intelligent function module switch setting to match
	systems and devices connected to the QD65PD2.
	For details on how to use the intelligent function module switch setting, refer to GX
	Works2 Operating Manual (Common).
FB operation type	Real-time execution
Application example	Refer to Appendix 1 - Application examples

Timing chart •Operation of I/O signals [When operation completes without error] [When an error occurs] FB_EN (Execution command FB_ENO (Execution command PB_ENO (Execution command PB_ENO (Execution command PB_ENO (Function input terminal pressurement) Public measurement FB Under Fine (function input) (function input)	Item	内容	
FB_ERROR (Error flag) FB_ERROR (Error flag)	Item Timing chart	 内容 Operation of I/O signals [When operation completes without error] FB_EN (Execution command (Y signal) Count enable command (Y signa	
ERROR ID (Error code) 0 ERROR ID (Error code) 0 Error code 0 Relevant manual Q series QD65PD2 multifunction counter/timer module user's manual	Relevant manual	ERROR_ID (Error code) 0 ERROR_ID (Error code) 0 Error code) Q series QD65PD2 multifunction counter/timer module user's manual	0

Error codes	
Error code list	
Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.

Name	Variable name	Data	Setting range	Description
		type		
Module start XY	i_Start_IO_No	W	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the QD65PD2
				module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	W	1~2	Specify the CH number.
Function input	i_MeasureByFUNC	В	ON, OFF	Turn ON when measuring
terminal				the pulse with the function
measurement				input terminal.
Latch counter input	i_MeasureByLATCH	В	ON, OFF	Turn ON when measuring
terminal				the pulse with the latch
measurement				counter input terminal.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates that the pulse is being
error				measured.
Measured pulse	o_UpdateForFUNC	В	OFF	When ON, it indicates that the measured
value update flag				pulse value of the function input terminal
(function input)				has been updated.
Measured pulse	o_ResultForFUNC	D	0	Store the measured pulse value of the
value (function input)				function input terminal.
Measured pulse	o_UpdateForLATCH	В	OFF	When ON, it indicates that the measured
value update flag				pulse value of the latch counter input
(latch counter input)				terminal has been updated.
Measured pulse	o_ResultForLATCH	D	0	Store the measured pulse value of the latch
value (latch counter				counter input terminal.
input)				
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_PulseMeasure function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

12.M+QD65PD2_PWMOutput (PWM output)

FB Name

M+QD65PD2_PWMOutput

Item	Description				
Function overview	Performs the PWM output function.				
Symbol	M+QD65PD2_PWMOutput				
	Execution command ——	B : FB_EN FB_ENO : B — Execution status			
	Module start XY address —	W : i_Start_IO_No FB_OK : B Completed without error			
	Target CH ——	W : i_CH FB_ERROR : B Error flag			
	PWM output assignment —	W : i_SetLayout ERROR_ID : W — Error code			
	On width setting (PWM output) ——	D : i_SetONTime			
	Cycle setting (PWM output) ——	D : i_SetCycleTime			
Applicable hardware	Compatible hardware: QD65PD2				
and software	Hardware details:				
	Q series *	Basic model			
		High performance model			
		Universal model			
	*Not applicable for QCPU (A n	node)			
	Compatible software: GX Works2 Ver1.31H or later				
Programming	Ladder	Ladder			
language					
Number of steps	For universal model CPU: 164*				
(maximum value)	*The value is the number of steps in the label program, and is therefore stated as a				
	reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple				
	Project).				
Function description	•By turning ON FB_EN (Execution command), the PWM output function is executed with the				
	preset i_SetLayout (PWM output assignment), I_SetONTime (On width setting (PWM				
	output)) and i_SetCycleTime	output)) and i_SetCycleTime (Cycle setting (PWM output)).			
	•When the target CH setting value is out of range, the FB_ERROR output turns ON,				
	processing is interrupted, and	processing is interrupted, and the error code is stored in ERROR_ID (Error code).			
	Refer to the error code explai	nation section for details.			
Compiling method	Macro type				

Item	Description					
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery					
precautions	processing separately in accordance with the required system operation.					
	2) The FB cannot be used in an interrupt program.					
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do					
	not use this FB in programs that are only executed once such as a subroutine,					
	FOR-NEXT loop, etc. because it is impossible to turn OFF.					
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of					
	the target CH.					
	5) This FB uses index registers Z9, Z8, Z7, and Z6. Please do not use these index registers					
	in an interrupt program.					
	6) Every input must be provided with a value for proper FB operation.					
	7) The intelligent function module switch setting needs to be set when executing the PWM					
	output function. For details, refer to the user's manual.					
	8) When this FB is used in two or more places, a duplicated coil warning will occur during					
	compile operation due to the Y signal being operated by index modification. However this					
	is not a problem and the FB will operate without error.					
	9) Perform settings using the GX Works2 intelligent function module switch setting to match					
	systems and devices connected to the QD65PD2.					
	For details on how to use the intelligent function module switch setting, refer to GX					
	Works2 Operating Manual (Common).					
FB operation type	Real-time execution					
Application example	Refer to Appendix 1 - Application examples					
Timing chart	Operation of I/O signals					
	[When operation completes without error] [When an error occurs]					
	FB_EN (Execution command)					
	FB_ENO (Execution status)					
	(buffer memory) setting Value (buffer memory) On width setting (PWM No Setting value On width setting (PWM No					
	output) (buffer memory) setting setting value output) (buffer memory) Cycle setting (PWM No Setting value Cycle setting (PWM					
	output) (buffer memory) setting output Cam switch function/ VM output start command VM output start command					
	(Y signal) (Y signal) (Y signal) (Y signal)					
	(terminal)					
	execution/PWM output (X signal) execution/PWM output (X signal)					
	FB_OK FB_OK (Completed without error) (Completed without error)					
	FB_ERROR (Error flag)					
	ERROR_ID (Error code) 0 ERROR_ID (Error code) 0 Error code 0					
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual					

EITOI COUES	Error	cod	es
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Error code list

Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

Labels

■ Input labels

Name	Variable name	Data type	Setting range	Description
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	W	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD65PD2 module is mounted. (For example, enter H10 for X10.)
Target CH	i_CH	W	1~2	Specify the CH number.
PWM output assignment	i_SetLayout	W	 b0: Coincidence output 1 b1: Coincidence output 2 b2: Coincidence output 3 b3: Coincidence output 4 b4: Coincidence output 5 b5: Coincidence output 6 b6: Coincidence output 7 b7: Coincidence output 8 b8~b15: Not used *1 0: Not assigned 1: Assigned 	Specify the comparison output to output the output pulse. *1 Set 0.
On width setting (PWM output)	i_SetONTime	D	0 or 10~10,000,000	Specify the ON width for the output pulse. (Unit: 0.1 µs)
Cycle setting (PWM output)	i_SetCycleTime	D	50~10,000,000	Specify the cycle time for the output pulse. (Unit: 0.1 µs)

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates that PWM output is
error				being performed.
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_PWMOutput function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

13.M+QD65PD2_OverflowDetection (Overflow/underflow detection)

FB Name

M+QD65PD2_OverflowDetection

Item	Description				
Function overview	Detects overflow and underflow.				
Symbol	M+QD65PD2_OverflowDetection				
	Execution command —	B : FB_EN	FB_ENO : B Execution status		
	Module start XY address —	W∶i Start IO No	o Overflow : B Overflow occurrence flag		
	Target CH	W · i CH	o Linderflow B Inderflow occurrence flag		
	Taiget of t				
			FB_ERROR : B Error flag		
			ERROR_ID : W —— Error code		
Applicable bardware	Compatible bardware: OD65D	2			
and software	Hardware details:				
		Basic model			
		High performance	e model		
		Universal model			
	*Not applicable for QCPU (A mean sector)	applicable for QCPU (A mode)			
	Compatible software: GX Work	<pre>xs2 Ver1.31H or late</pre>	er		
Programming	Ladder				
language					
Number of steps	For universal model CPU: 127*				
(maximum value)	*The value is the number of steps in the label program, and is therefore stated as a				
	reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple				
	Project).				
Function description	•By turning ON FB_EN (Execu	ution command), o_	Overflow (Overflow occurrence		
	flag)/o_Underflow (Underflow	occurrence flag) is	turned ON when overflow/underflow		
	occurs.				
	•When the target CH setting va	alue is out of range,	, the FB_ERROR output turns ON,		
	processing is interrupted, and	I the error code is st	tored in ERROR_ID (Error code).		
	Refer to the error code explar	nation section for de	etails.		
Compiling method	Macro type				

Item	Description					
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery					
precautions	processing separately in accordance with the required system operation.					
	2) The FB cannot be used in an interrupt program.					
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do					
	not use this FB in programs that are only executed once such as a subroutine,					
	FOR-NEXT loop, etc. because it is impossible to turn OFF.					
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of					
	the target CH.					
	5) This FB uses index registers Z9, Z8 and Z7. Please do not use these index registers in an					
	interrupt program.					
	6) Every input must be provided with a value for proper FB operation.					
	7) Perform settings using the GX Works2 intelligent function module switch setting to match					
	systems and devices connected to the QD65PD2.					
	For details on how to use the intelligent function module switch setting, refer to GX					
	Works2 Operating Manual (Common).					
FB operation type	Real-time execution					
Application example	Refer to Appendix 1 - Application examples					
Timing chart	•Operation of I/O signals					
	(When an overflow occurs)					
	[When operation completes without error] [When an error occurs]					
	FB_EN (Execution command)					
	FB_ENO (Execution status)					
	Overflow/underflow detection flag; b08 (buffer memory) 0 1 0					
	o_Overflow (Overflow occurrence flag)					
	FB_ERROR (Error flag)					
	ERRORUD (Error code)					
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual					

Error codes	
Error code list	
Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No	W	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the QD65PD2
				module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	W	1~2	Specify the CH number.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Overflow occurrence	o_Overflow	В	OFF	ON: Overflow occurred.
flag				OFF: No overflow detected.
Underflow	o_Underflow	В	OFF	ON: Underflow occurred.
occurrence flag				OFF: No underflow detected.
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_OverflowDetection function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

14.M+QD65PD2_ErrorOperation (Error operation)

FB Name

M+QD65PD2_ErrorOperation

Item	Description			
Function overview	Monitors errors and warnings, and performs error reset.			
Symbol	M+QD65PD2_ErrorOperation			
	Execution command —	B : FB_EN	FB_ENO : B	— Execution status
	Module start XY address —	W : i_Start_IO_No	FB_OK : B	— Completed without error
	Target CH ——	W : i_CH	o_UnitError : B	— Module error detection
	Error reset request —	W : i_ErrorReset	o_ErrorCode : W	— Module error code
			o_UnitWarning : B	— Module warning detection
			o_WarningCode : W	— Module warning code
			FB_ERROR : B	—— Error flag
			ERROR_ID : W	— Error code
Applicable hardware	Compatible hardware: QD65P	D2		
and software	Hardware details:			
	Q series *	Basic model		
		High performar	nce model	
		Universal mode	el	
	*Not applicable for QCPU (A n	node)		
	Compatible software: GX Wor	ks2 Ver1.31H or l	ater	
Programming	Ladder			
language				
Number of steps	For universal model CPU: 263*			
(maximum value)	*The value is the number of steps in the label program, and is therefore stated as a			
	reference value. For details, i	refer to the GX W	orks2 Version1 O	peration Manual (Simple
	Project).			

Item	Description
Function description	•When FB_EN (Execution command) is turned ON, an error and warning in the target axis
	are monitored.
	•When an error occurs, o_UnitError (Module error detection) is turned ON and an error code
	is stored in o_ErrorCode (Module error code).
	•When a warning occurs, o_UnitWarning (Module warning detection) is turned ON and a
	warning code is stored in o_WarningCode (Module warning code).
	•After FB_EN (Execution command) is turned ON, an error is reset by turning ON
	i_ErrorReset (Error reset command) while an error or warning is occurring.
	•When the target CH setting value is out of range, the FB_ERROR output turns ON,
	processing is interrupted, and the error code is stored in ERROR_ID (Error code).
	Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery
precautions	processing separately in accordance with the required system operation.
	2) The FB cannot be used in an interrupt program.
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do
	not use this FB in programs that are only executed once such as a subroutine,
	FOR-NEXT loop, etc. because it is impossible to turn OFF.
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of
	the target CH.
	5) This FB uses index registers Z9, Z8, Z7, and Z6. Please do not use these index registers
	in an interrupt program.
	6) Every input must be provided with a value for proper FB operation.
	7) Perform settings using the GX Works2 intelligent function module switch setting to match
	systems and devices connected to the QD65PD2.
	For details on how to use the intelligent function module switch setting, refer to GX
	Works2 Operating Manual (Common).
FB operation type	Real-time execution
Application example	Refer to Appendix 1 - Application examples



Error codes

Error code list	
Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of 1 to 2.
	Please try again after confirming the setting.

Labels				
■Input labels				
Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.

Name	Variable name	Data	Setting range	Description
		type		
Module start XY	i_Start_IO_No	W	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the QD65PD2
				module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	W	1~2	Specify the CH number.
Error reset request	i_ErrorReset	В	ON, OFF	Turn ON when performing
				error reset.
				Turn OFF the request
				when the normal
				completion (FB_OK) has
				turned ON.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates that an error reset is
error				completed.
Module error	o_UnitError	В	OFF	When ON, it indicates that an error has
detection				occurred.
Module error code	o_ErrorCode	W	0	Return a code for a target channel error
				occurred in the module.
Module warning	o_UnitWarning	В	OFF	When ON, it indicates that a warning is
detection				occurring.
Module warning	o_WarningCode	W	0	Return a code for a target channel warning
code				occurred in the module.
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_ErrorOperation function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

15.M+QD65PD2_DegreeToCountVal (Angle conversion)

FB Name

M+QD65PD2_DegreeToCountVal

Item	Description			
Function overview	Calculates the count value fro	m the angle.		
Symbol		M+QD65PD2_De	egreeToCountVal	
	Execution command — B : FB_EN FB_ENO : B Execution status			
	Angle —	W : i_Angle	FB_OK : B Completed without error	
	Resolution —	D : i_Resolution	o_CountVal : D Count value	
	Zero degree setting value —	W : i_ZeroValue	FB_ERROR : B — Error flag	
			ERROR_ID : W — Error code	
Applicable hardware	Compatible hardware: QD65P	D2		
and software	Hardware details:			
	Q series * Basic model			
		High performar	nce model	
		Universal mode	el	
	*Not applicable for QCPU (A n	node)		
	Compatible software: GX Wor	ks2 Ver1.31H or I	ater	
Programming	Ladder			
language				
Number of steps	For universal model CPU: 127*			
(maximum value)	*The value is the number of steps in the label program, and is therefore stated as a			
	reference value. For details,	refer to the GX W	orks2 Version1 Operation Manual (Simple	
	Project).			

Item	Description				
Function description	•By turning ON FB_EN (Execution command), the count value is calculated from the angle				
	(input by 0.1 degree). The calculation is performed by using a resolution for the ring counter				
	upper value and 0 for the lower value.				
	•The count value is calculated as follows.				
	How to calculate the counter value (o_CountVal).				
	●i_Angle + (3600 + i_Resolution) + i_ZeroValue				
	When the calculated value is larger than the resolution (i_Resolution), the value of the				
	in the counter value (o. CountVal)				
	•When the input value is out of range, the FB_ERROR output turns ON, processing is				
	Interrupted, and the error code is stored in ERROR_ID (Error code).				
Compiling mothod	Refer to the error code explanation section for details.				
Compiling method	Macro type				
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery				
precautions	processing separately in accordance with the required system operation.				
	2) The FB cannot be used in an interrupt program.				
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do				
	not use this FB in programs that are only executed once such as a subroutine,				
	FOR-NEX I loop, etc. because it is impossible to turn OFF.				
	4) Every input must be provided with a value for proper FB operation.				
FB operation type	Real-time execution				
Application example	Refer to Appendix 1 - Application examples				
Timing chart	•Operation of I/O signals				
	[When operation completes without error] [When an error occurs]				
	FB_ENO (Execution status) FB_ENO (Execution status)				
	a CountVal				
	(Count value) 0 Updated value 0 cCountVal (Count value) 0 0				
	(Completed without error)				
	FB_ERROR (Error flag) FB_ERROR (Error flag)				
Relevant manual	Q series QD65PD2 multifunction counter/timer module user's manual				

Error codes

Error code list

Error code	Description
20 (Decimal)	The specified resolution is not valid. The resolution is not within the range of 10 to 32,768.
	Please try again after confirming the setting.
21 (Decimal)	The specified zero degree setting value is not valid. The zero degree setting value is not
	within the range of 0 to (i_Resolution-1).
	Please try again after confirming the setting.
22 (Decimal)	The specified angle is not valid. The angle is not within the range of 0 to 3,599.
	Please try again after confirming the setting.

Labels

■Input labels

Name	Variable name	Data	Setting range	Description
		type		
Execution command	FB_EN	В	ON, OFF	ON: The FB is activated.
				OFF: The FB is not
				activated.
Angle	i_Angle	W	0~3,599	Specify the angle.
				(Unit: 0.1 degree)
Resolution	i_Resolution	D	10~32,768	Specify the encoder
				resolution.
Zero degree setting	i_ZeroValue	W	0~(i_Resolution-1)	Specify the value that is
value				considered as zero
				degree.

■Output labels

Name	Variable name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	В	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	В	OFF	When ON, it indicates that calculation is
error				being performed.
Count value	o_CountVal	D	0	Store the count value that has been
				calculated from the angle.
Error flag	FB_ERROR	В	OFF	When ON, it indicates that an error has
				occurred.
Error code	ERROR_ID	W	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2010/10/31	First edition

Note

This chapter includes information related to the M+QD65PD2_DegreeToCountVal function block.

It does not include information on restrictions of use such as combination with multifunction counter/timer modules or programmable controller CPUs.

16.Application examples QD65PD2 FB Application example System configuration

Power Supply Module	CPU Module	QD65PD2 (X/Y00 ~
		X/Y1F)

Reminder

- •Every input must be provided with a value for proper FB operation.
- If not set, the values will be unspecified.
- •Abbreviations may be used in the label comments due to the limitation on the number of the characters to display in GX Works2.

List of devices

External input (commands)

Device	FB function name	Application (ON details)		
MO	Ring counter setting	Ring counter setting request		
M10	Count enable	Count enable command		
M20	Preset value monitoring	Present value read request		
M30	Coincidence output function setting	Coincidence output set request		
M40	Preset/replace	Preset/replace execution cmd		
M50	Latch counter function operation	Latch counter command		
M60	Sampling counter function	Sampling count command		
M70	Periodic pulse counter function	Periodic pulse count command		
10170	operation			
M80	Frequency measurement	Frequency measurement command		
M90	Rotation speed measurement	Rot. speed measurement command		
M100		Pulse measurement command		
M101	Pulse measurement	Fnc input terminal measurement		
M102		Latch counter input tml measure		
M110	PWM output	PWM output command		
M120	Overflow/underflow detection	Overflow/underflow detection command		
M130	Error operation	Error operation FB start		
M131		Error reset command		
M140	Angle conversion	Angle operation FB exe command		

Data register

Device	FB function name	Application	
D0	Ring counter setting	Ring counter setting error code	
D10	Count enable	Count enable FB error code	
D20		Present value	
D21	Preset value monitoring		
D22		Monitoring error code	
D40	Preset/replace	Preset/replace FB error code	
D50		Latch count value	
D51	Latch counter function operation		
D52		Latch counter execution err code	
D60	Sampling counter function	Sampling count value	
D61	operation		
D62		Sampling execution error code	
D70		Periodic pls cnt, difference val	
D71	Periodic pulse counter function	• •	
D72	operation	Periodic pls cnt, present value	
D73		Periodic pls counter error code	
D80		Measured frequency value	
D81	Frequency measurement		
D82		Freq. measurement FB error code	
D90			
D91	Rotation speed measurement	ivieasured rotation speed value	
D92		Rot. spd measurement FB err code	
D100		Measured pls val (fnc input)	
D101			
D102	Pulse measurement	Measured pls val (Ich cntr inp)	
D103			
D104		Pulse measurement FB error code	
D110	PWM output	PWM output FB error code	
D120	Overflow/underflow detection	Ovf/udf detection FB error code	
D130	F	Module error code	
D131	Error operation	Ivioquie warning code	
D132		Error operation function FB error code	
D140	Angle conversion	Count value	
D141		Angle conversion function ER error code	
0142		Angle conversion function FB effor code	

Ex <u>te</u>	rnal ou	utput (checks)		
E	Device	FB function name	Application (ON details)	
	M1		Ring counter setting FB ready	
	M2	Ring counter setting	Ring counter setting complete	
	F0		Ring counter setting FB error	
	M11		Count enable FB ready	
	M12	Count enable	Counter operation flag	
	F5		Count enable FB error	
	M21		Present value monitoring ready	
	M22	Preset value monitoring	Present value read OP complete	
	F10		Present value monitoring error	
	M31	Coincidence output function	Coincidence output fcn set ready	
	M32	setting	Coincidence output fcn set comp	
	M41		Preset/replace FB ready	
	M42	Preset/replace	Preset/replace exe complete	
	F15	-	Preset/replace FB error	
	M51	Latab an interation	Latch counter execution ready	
	M52		Latch counter execution complete	
	F20	operation	Latch counter execution error	
	M61	Consulia a constanti setie a	Sampling counter execution ready	
	M62	Sampling counter function	Sampling counter execution comp	
	F25	operation	Sampling counter execution error	
	M71		Periodic pls counter ready	
	M72	Periodic pulse counter function	Periodic pls counter complete	
	F30	operation	Periodic pls counter error	
	M81		Frequency measurement FB ready	
	M82	Frequency measurement	Frequency measurement complete	
	F35		Frequency measurement FB error	
	M91		Rot. speed measurement FB ready	
	M92	Rotation speed measurement	Rot. speed measurement complete	
	F40		Rot, speed measurement FB error	
1	M103	Pulse measurement	Pulse measurement FB ready	
1	M104		Pulse measurement complete	
1	M105		Function input update flag	
	M106		Latch counter input update flag	
	F45	1	Pulse measurement FB error	
	M111	PWM output	PWM output function FB ready	
	M112		PWM output execution complete	
	F50	-	PWM output FB error	
1	M121		Ovf/udf detection FB ready	
	M122	22 23 Overflow/underflow detection	Overflow being detected	
	M123		Underflow being detected	
	F55		Overflow/underflow FB error	
	M132		Error operation FB ready	
	M133	Error operation	Error reset execution complete	
	M134		Module error detection	
1	M135		Module warning detection	
	F60		Error operation FB error	
	M141		Angle conversion FB ready	
	M142	Angle conversion	Angle conversion exe complete	
	F65	-	Angle conversion FB error	

M+QD65PD2_RingCounterSetting (Ring counter setting)



M+QD65PD2_CountEnable (Count enable)



M+QD65PD2_PresentValueStorage (Present value monitoring)



M+QD65PD2_SetCoincidenceOutput (Coincidence output function setting)

M30	SetCoin		
	B'FB FN	FB ENO'B	(M31)
Coincide	Executio	Executio	Coincide
nce outp	n comman	n status	nce outp
utsetr	la la	Tradidia	ut for a
acuest	19		atreadu
equest			et ready
HO	₩:i_Start_IO_No	FB_OK:B	(M32)
	Module s	Complete	Coincide
	tart XY	d withou	nce outp
	address	t error	ut fon s
		(0.00	et comp
			et comp
(K1000	J D:i_SetPoint1	FB_ERROR:B	
	Point se	Error fl	
	tting (c	ag	
	oinciden		
	ce outpu		
	· ·		
Гиород			
(K2000	J D:LSetPoint2	ERROR_ID:W	
	Point se	Error co	
	tting (c	de	
	oinciden		
	ce outpu		
[V2000	T Dui CatPaint2		
[K3000			
	Point se		
	tting (c		
	oinciden		
	ce outpu		
[K4000	1 Dri SetPoint4		
[1(4000	Boint on		
	Hing (a		
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	oinciden		
	ce outpu		
K5000] D:i SetPoint5		
[Point se		
	tting (c		
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	ce outpu		
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	Point se		
	tting (c		
	oinciden		
	celoutou		
	CC CAPA		
(K7000	D:i_SetPoint7		
	Point se		
	tting (c		
	oinciden		
	ce outpu		
Г <i>и</i> ороо	Dui CalDainto		
(K8000			
	Foint se		
	tting (c		
	oinciden		
	ce outpu		

M+QD65PD2_Preset (Preset/replace)



M+QD65PD2_LatchCounterOperation (Latch counter function operation)


M+QD65PD2_SamplingOperation (Sampling counter function operation)

мео	Samp	ling		(1101
Sampling count c ommand	- B:FB_EN Executio n comman d	FB_ENU:B Executio n status		(M61) Sampling counter executi on ready
(но	W:i_Start_IO_No Module s tart XY address	FB_OK:B Complete d withou t error		(M62) Sampling counter executi on comp
[К1	W:i_CH Target C H	o_SamplingCount:D Sampling count v alue	{D60 } Sampling count v alue	
(КО]	W:i_SetUnitTime Time uni t settin g (sampl ing coun	FB_ERROR:B Error fl ag		(F25) Sampling counter executi on error
[K500]	W:i_SamplingTime Cycle se tting (s ampling counter)	ERROR_ID:W Error co de	[D62] Sampling executi on error code	

M+QD65PD2_PeriodicPulseCounter (Periodic pulse counter function operation)

м70	Period	licPulse]	
Periodic pulse c ount com mand	B:FB_EN Executio n comman d	FB_ENO:B Executio n status		(M71) Periodic pls cou nter rea dy
{но	} W:i_Start_IO_No Module s tart XY address	FB_OK:B Complete d withou t error		(M72) Periodic pls cou nter com plete
{[K1	} W:i_CH Target C H	o_DifferenceVal:D Periodic pulse c ount, di fference	{D70 } Periodic pls cnt , differ ence val	
(ко	W:i_SetUnitTime Time uni t settin g (perio dic puls	o_PresentVal:D Periodic pulse c ount, pr esent va	{D72 } Periodic pls cnt , presen t value	
{K1000	W:i_PeriodTime Cycle se tting (p eriodic pulse co	FB_ERROR:B Error fl ag		F30) Periodic pls cou nter err or
		ERROR_ID:W Error co de	[D74] Periodic pls cou nter err or code	

M+QD65PD2_FrequencyMeasure (Frequency measurement)

M80 Frequenc y measur ement co mmand	Frequ B:FB_EN Executio n comman d	FB_ENO:B Executio n status		(M81) Frequenc y measur ement FB ready
(но	} W:i_Start_I0_No Module s tart XY address	FB_OK:B Complete d withou t error		(M82) Frequenc y measur ement co mplete
[К1	} W:i_CH Target C H	o_FrequencyVal:D Measured frequen cy value	{D80 } Measured frequen cy value	
(КО	W:i_SetUnitTime Time uni t settin g (frequ ency mea	FB_ERROR:B Error fl ag		(F35) Frequenc y measur ement FB error
[К10	W:i_SetAverage Moving a verage c ount (fr equency	ERROR_ID:W Error co de	[D82] Freq.me asuremen tFBen1 or code	

M+QD65PD2_RotationSpeedMeasure (Rotation speed measurement)

M90	Rotatio	nSpeed		
Rot. spe ed measu rement c ommand	B:FB_EN Executio n comman d	FB_ENO:B Executio n status		(M91) Rot. spe ed measu rement F B ready
[но	} W:i_Start_I0_No Module s tart XY address	FB_OK:B Complete d withou t error		(M92) Rot. spe ed measu rement c omplete
[К1	} W:i_CH Target C H	o_RotationVal:D Measured rotatio n speed value	{D90 } Measured rotatio n speed value	
[КО	W:i_SetUnitTime Time uni t settin g (rotat ion spee	FB_ERROR:B Error fl ag		(F40) Rot. spe ed measu rement F B error
{K10	W:i_SetAverage Moving a verage c ount (ro tation s	ERROR_ID:W Error co de	[D92] Rot. spd measure ment FB err code	
[К60	D:i_SetRotation No. of p ulses pe r rotati on			

M+QD65PD2_PulseMeasure (Pulse measurement)

M100	PulseM	leasure			
Pulse me asuremen t comman	B:FB_EN Executio n comman d	FB_ENO:B Executio n status		(M103 Pulse me asuremen t FB rea	>
а (но]	W:i_Start_I0_No Module s	FB_OK:B Complete		dy (M104 Pulse me	>
	tart XY address	d withou t error		asuremen t comple te	
[К1]	W:i_CH Target C H	o_UpdateForFUNC:B Measured pulse v alue upd ate flag		(M105 Function input u pdate fl ag	>
M101 Fnc inpu t termin al measu rement	B:i_MeasureByFUNC Function input t erminal measurem	o_ResultForFUNC:D Measured pulse v alue (fu nction i	[D100] Measured pls val (fnc in put)		
M102 Latch co unter in put tml measure	B:i_MeasureByLATCH Latch co unter in put term inal mea	o_UpdateForLATCH:B Measured pulse v alue upd ate flag		(M106 Latch co unter in put upda te flag	>
		o_ResultForLATCH:D Measured pulse v alue (la tch coun	[D102] Measured pls val (Ich cn tr inp)		
		FB_ERROR:B Error fl ag		(F45 Pulse me asuremen t FB err or	>
		ERROR_ID:W Error co de	[D104] Pulse me asuremen t FB err or code		

M+QD65PD2_PWMOutput (PWM output)

M110	Г	PWMOutput			
PWM outp	I E	B:FB_EN Executio	FB_ENO:B Executio		—(M111) PWM outp
ut comma nd	r c	n comman 1	n status		ut funct ion FB r eady
[·····[·	י ן כ ו- א ג	W:i_Start_IO_No Module s art XY address	FB_OK:B Complete d withou t error		—(M112) PWM outp ut execu tion com plete
[·[·	רז וי ו	W:i_CH Farget C H	FB_ERROR:B Error fl ag		(F50) PWM outp ut FB er ror
[-11] Y	W:i_SetLayout ™/Moutp utassig nment	ERROR_ID:W Error co de	{D110 } PWM outp ut FB er ror code	
[H	<1000] [(D:i_SetONTime Dn width setting (PW/M ou put)			
[[H	<2000] (t	D:i_SetCycleTime Cycle se ting (P //M outpu)			

M+QD65PD2_OverflowDetection (Overflow/underflow detection)



M+QD65PD2_ErrorOperation (Error operation)



M+QD65PD2_DegreeToCountVal (Angle conversion)

M140 Angle op eration FB exe c ommand	DegreeToCoun - B:FB_EN Executio n comman d	t FB_ENO:B Executio n status		-(M141) Angle co nversion FB read y
[K500	W:i_Angle Angle	FB_OK:B Complete d withou t error		–(M142) Angle co nversion exe com plete
[K3600] D:i_Resolution Resoluti on	o_CountVal:D Count va lue	[D140] Count va lue	
[K1000	W:i_ZeroValue Zerodeg reesett ingvalu e	FB_ERROR:B Error fl ag		–(F65) Angle co nversion FB erro r
		ERROR_ID:W Error co de	[D142] Angle co nversion FB erro r code	