Chapter 23

REMOTE INSTRUMENTS

Edition 4

Overview

This class of function blocks provide a standard interface to remote devices connected to PC3000 by a serial link. Function blocks are provided to interface with discrete temperature controllers, AC and DC drives and thyristor stacks using EI Bisync Master Driver. The earlier function block GenRmtInst is obsolete and it is recommended that it is not used in applications.

These blocks are currently in development.

RMTCONTROLR FUNCTION BLOCK

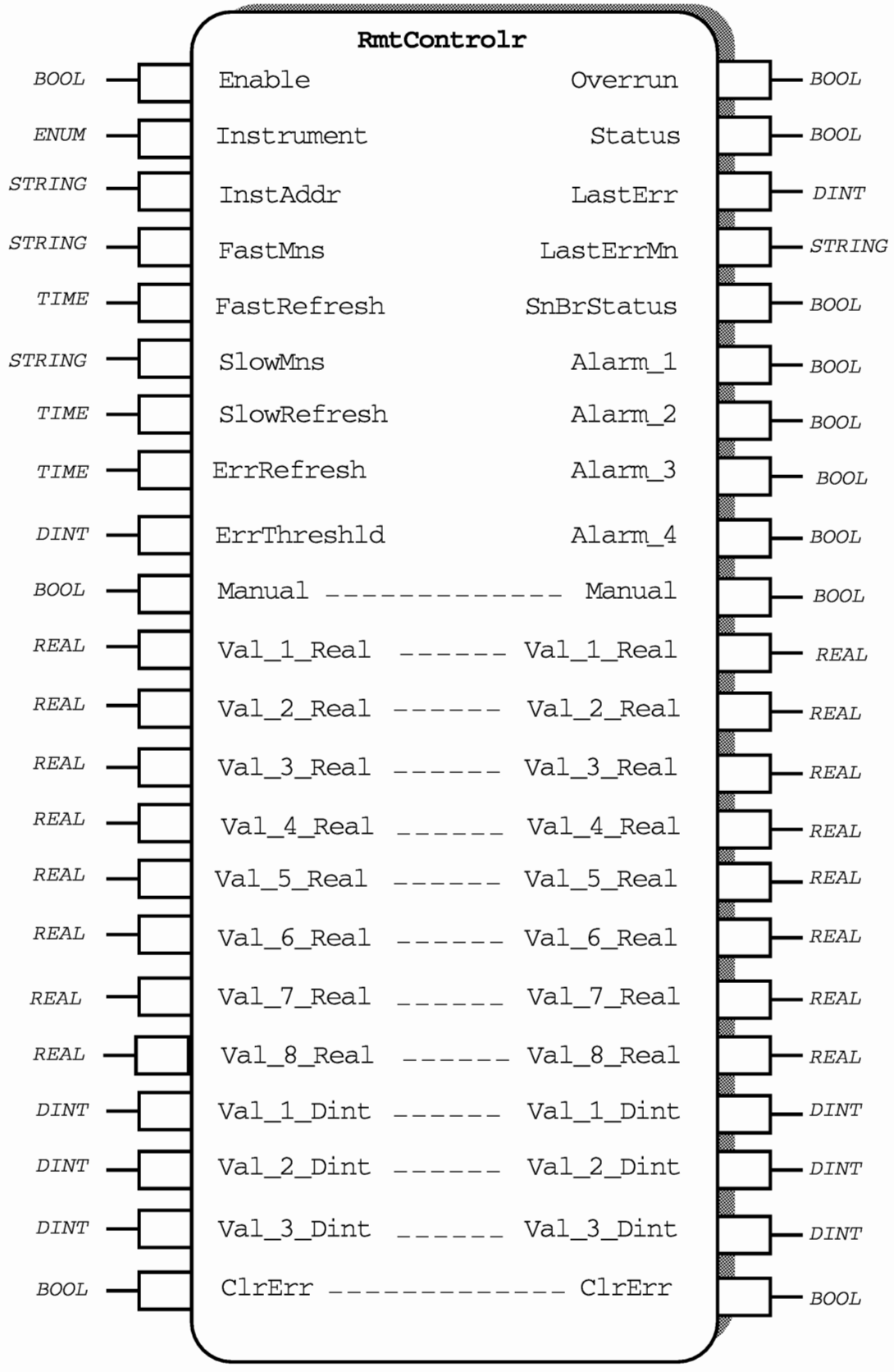

Figure 23-1 RmtControlr Function Block Diagram

Functional Description.

A block used to link to one of the Eurotherm Controls controller products - 808, 94, 818, 902, 900EPC or Series 2000 range. It provides access to up to 8 floating point parameters and 3 integer parameters at two scan rates - one fast (should be used for the PV) and one slow (should be used for SP, PID parameters etc).

The block also provides error handling to minimise polling of instruments missing from the link and to re-establish communications when the link is restored.

In applications with multiple instances of the block it would be prudent to stagger setting the Enable on the blocks so that they start one by one. Each block will allow only one comms transaction at a time to be in progress. The Q_Space in the associated BiSync Master will show the state of the link.

Function Block Attributes

Type DC21

Class ..... REMOTE_INST

Default Task ..... Task_2

Short List ..... InstAddr, Enable, Status, Overrun

Memory Requirements ..... 740 bytes

Parameter Descriptions

Enable

Setting this pin to 1 (Enable) causes the parameters defined by the mnemonics in the FastMns and SlowMns strings to be parsed and polling of the instrument to begin, mnemonic by mnemonic. The Status will only become 1 (Go) after all the mnemonics have been polled successfully once.

> Note: The mnemonics are only parsed ONCE when the Enable pin goes from 0 (disable) to 1 (Enable). To change a mnemonic Enable should be set to 0 (Disable), the mnemonic string changed, and then Enable set to 1 (Enable).

Setting this pin to 0 (Disable) causes polling to stop. Once the block is disabled the Status will become (NOGO) indicating that polling has stopped.

If a parameter is in the process of being polled/written when the block is disabled then the current transaction will complete before disabling is completed.

Instrument

The model number of the Eurotherm controller being addressed. Supported types are-

0	(Undef)	- Any
1	(E818)	- Eurotherm 818/815
2	(E902)	- Eurotherm 902/903/904
3	(E900EPC)	- Eurotherm 900EPC
4	(E94)	- Eurotherm 94c
5	(E808)	- Eurotherm 808/847
6	(E2000)	- Eurotherm Series 2000

In the 0 (Undef) mode no additional parameters are polled and the **Manual, SnBrStatus** and **Alarm_1** to **Alarm_4** pins are not supported.

In the 1 (E818) mode the SW parameter is added to the fast poll and the following functions are supported -

Manual	(SW bit 15)
SnBrStatus	(SW bit 1)
Alarm_1	(SW bit 10)
Alarm_2	(SW bit 8)

Alarm_3 and Alarm_4 are not used.

In the 2 (E902) mode the SW parameter is added to the fast poll and the following functions are supported -

Manual	(SW bit 15)
SnBrStatus	(SW bit 1)
Alarm_1	(SW bit 10)
Alarm_2	(SW bit 8)

Alarm_3 and Alarm_4 are not used.

In the 3 (E900EPC) mode the WL and WA parameters are added to the fast poll and the following functions are supported -

Manual	(WL bit 0)
SnBrStatus	(WL bit 7 & bit 15)
Alarm_1-4	(WA bits 8,9,10 and 11 respectively for loop 1).
	(WA bits 20, 21, 22 and 23 respectively for loop 2).

In the 4 (E94) mode the SW parameter is added to the fast poll and the following functions are supported -

SnBrStatus	(SW bit 1 & bit 3)
Alarm_1	(SW bit 10)

Alarm_2 (SW bit 8)

Alarm_3, Alarm_4 and Manual are not used.

In the 5 (E808) mode the SW parameter is added to the fast poll and the following functions are supported -

Manual (SW bit 15)

SnBrStatus (SW bit 1)

Alarm_1 (SW bit 11)

Alarm_2 (SW bit 9)

Alarm_3 (SW bit 7)

Alarm_4 is not used

In the 6 (E2000) mode the mA and FS parameters are added to the fast poll and the following functions are supported -

Manual (mA bit 0)

SnBrStatus (FS bit 5 & bit 6 & bit 7)

Alarm_1 (FS bit 0)

Alarm_2 (FS bit 1)

Alarm_3 (FS bit 2)

Alarm_4 (FS bit 3)

InstAddr

The address of the instrument e.g. '0A12 ' represents

'0' = Slot 0 (LCM)

'A' = Port A

'1' = Group ID 1

'2' = Unit ID 2

' ' = Channel ID (Space = none)

Note that there must be a character in the channel ID position. If required a space character must be used to indicate no channel ID

FastMns

The list of two character, comma separated, mnemonics to be polled at the fast refresh rate. This is meant for parameters, like the PV, which are changing all the time.

A maximum of 8 real and 3 integer parameters can be fetched by the blocks slow and fast polls put together. Extra parameters will be ignored.

See the pin Instrument for additional parameters depending on type.

Parameters correspond to Val_<n>_Real/Dint in the order in which they appear in the FastMns and then the SlowMns strings. Parameters implied by Instrument type come before the FastMns.

An additional one character suffix may be added to each mnemonic to indicate the bisync format to be used. (see **Rmt_Real/Rmt_Dint.**Address in Chapter 12 for details.) When no format is specified the default is 'f' except when Instrument=4 (94) in which case it is 'g'. The use of an integer format character (e.g. Z,B,X or Y) is what distinguishes real from integer parameters.

At each poll rate real parameters are polled before integers. If instrument type is 902, FastMns = 'PV, IIX, OP' and SlowMns = 'SL, OSX, SP' then the polling order would be PV, OP, SW, II for the fast poll and SL, SP, OS for the slow poll.

FastRefresh

The refresh rate for the polling of the "fast" mnemonics.

SlowMns

The list of two character, comma separated, mnemonics to be polled at the slow refresh rate. (See FastMns).

SlowRefresh

The refresh rate for the polling of the "slow" mnemonics.

ErrRefresh

The refresh rate to be used when polling is not successful.

This rate will continue to be used until all the parameters have been read successfully once, at which point polling will continue at the fast and slow poll rates and the blocks Status will become 1 (Go).

Note that the error poll rate does not begin until the number of errors specified by ErrThreshld have occurred.

ErrThreshld

The number of errors which are permitted before the blocks **Status** becomes 0 (NOGO) and polling drops to the **ErrRefresh** rate. The fast and slow polls are counted separately and either count exceeding this error threshold will trigger the error refresh rate.

Each count is individually cleared after a poll is completed successfully.

Overrun

Overrun becomes 1 (True) when a previous poll has not been completed when the next one is due.

If this occurs then the poll is skipped and data may be lost/delayed. Overruns are likely if a re-try occurs and takes a long time, or when the refresh rates are too short for the parameters to be polled.

Status

An indication of the overall status of the link with the controller.

Status becomes 1 (Go) once all the parameters have been polled once successfully.

Status becomes (NOGO) after ErrThreshld failed reads of parameters.

Note that fast, slow or error poll will be aborted on the first occurrence of a failure even if the **ErrThreshld** has not been reached.

LastErr

The remote parameter error code of the last error which occurred. Refer to EI Bisync_M errors in chapter 3.

LastErrMn

The 2 character mnemonic of the last parameter which caused an error followed by the format character used to read/write it.

SnBrStatus

The sensor break status of the instrument.

This parameter is an or of all sensor break, loop break and gross load failure alarms which are available depending on the type of instrument selected.

Alarm_1

The first alarm (if used). (Refer to Instrument.)

Alarm_2

The second alarm (if used). (Refer to Instrument.)

Alarm_3

The third alarm (if used). (Refer to Instrument.)

Alarm_4

The fourth alarm (if used). (Refer to Instrument.)

Manual

The Auto/Manual mode of the instrument (if used).The value of this pin corresponds the to auto/manual bit in the appropriate parameter. For details of which bit/parameter it corresponds to refer to Instrument.

For Instrument types of 0 (Undef) and 4 (E94) the Manual pin is not used.

If the Instrument type is 1 (E818), 2 (E902), 3 (E900EPC) or 5 (E808) then a read-modify-write will be performed on the relevant status word whenever the value of Manual is changed on the block.

For Instrument type 6 (E2000) a simple write is performed on the mA parameter whenever the value of Manual is changed on the block.

Val_1_Real

The first real parameter.

This parameter will be polled at the requested polling rate. If the parameter value is changed it will be written immediately a maximum of once per poll time. If the parameter has already been written within the poll time then the write will be delayed until the next poll. If faster continuous writing is required then the poll rate of the parameter should be increased to a suitable level.

Val_2_Real to Val_8_Real - as Val_1_Real.

Val_1_Dint

The first integer parameter.

Polling and writing strategy is the same as that used for real parameters.

Val_2_Dint and Val_3_Dint - as Val_1_Dint

ClrErr

Setting this parameter to 1 (True) clears **LastErr** and **LastErrMn.** On execution of the block this parameter will always return to 0 (False).

Errors are cleared before the rest of the execution of the block so that an error which occurs on the same execution as the clear is detected will still be output from the block.

Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Enable	**BOOL**	Disable	Oper	Oper	Senses	Disable (0) Enable (1)
Instrument	**ENUM**	E902	Oper	Oper	Senses	Undef (0) E818 (1) E902 (2) E900EPC (3) E94 (4) E808 (5) E2000 (6)
InstAddr	**STRING**	'0A00 '	Oper	Oper	Max characters 5	
FastMns	**STRING**	'PV,OP'	Oper	Oper	Max characters 43	
FastRefresh	**TIME**	2s	Oper	Oper	High Limit Low Limit	2147483647 0
SlowMns	**STRING**	'SL'	Oper	Oper	Max characters 43	
SlowRefresh	**TIME**	20s	Oper	Oper	High Limit Low Limit	123d23h59m59s999 0
ErrRefresh	**TIME**	1m	Oper	Oper	High Limit Low Limit	123d23h59m59s999 0
ErrThreshld	**DINT**	1	Oper	Oper	High Limit Low Limit	2147483647 1
Manual	**BOOL**	Auto	Oper	Oper	Senses	Auto (0) Manual (1)
Val_1_Real to Val_8_Real	**REAL**	0	Oper	Oper	High Limit Low Limit	3.402823e+38 -3.402823e+38
Val_1_Dint to Val_3_Dint	**DINT**	0	Oper	Oper	Senses	2147483646 -2147483647
ClrErr	**BOOL**	False	Oper	Oper	Senses	False (0) True (1)
Overrun	**BOOL**	False	Oper	Block	Senses	False 0) True (1)
Status	**BOOL**	NOGO	Oper	Block	Senses	Go (1) NOGO (0)
LastErr	**DINT**	0	Oper	lock	High Limit Low Limit	255 0

Table 23-1 RmtControlr Parameter Attributes (continued)

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
LastErrMn	**STRING**	''	Oper	Block	Max characters 3	
SnBrStatus	**BOOL**	Off	Oper	Block	Senses	Off (0) On (1)
Alarm_1 to Alarm_4	**BOOL**	Off	Oper	Block	Senses	Off (0) On (1)

Table 23-1 RmtControlr Parameter Attributes

GENRMTDRIVE FUNCTION BLOCK

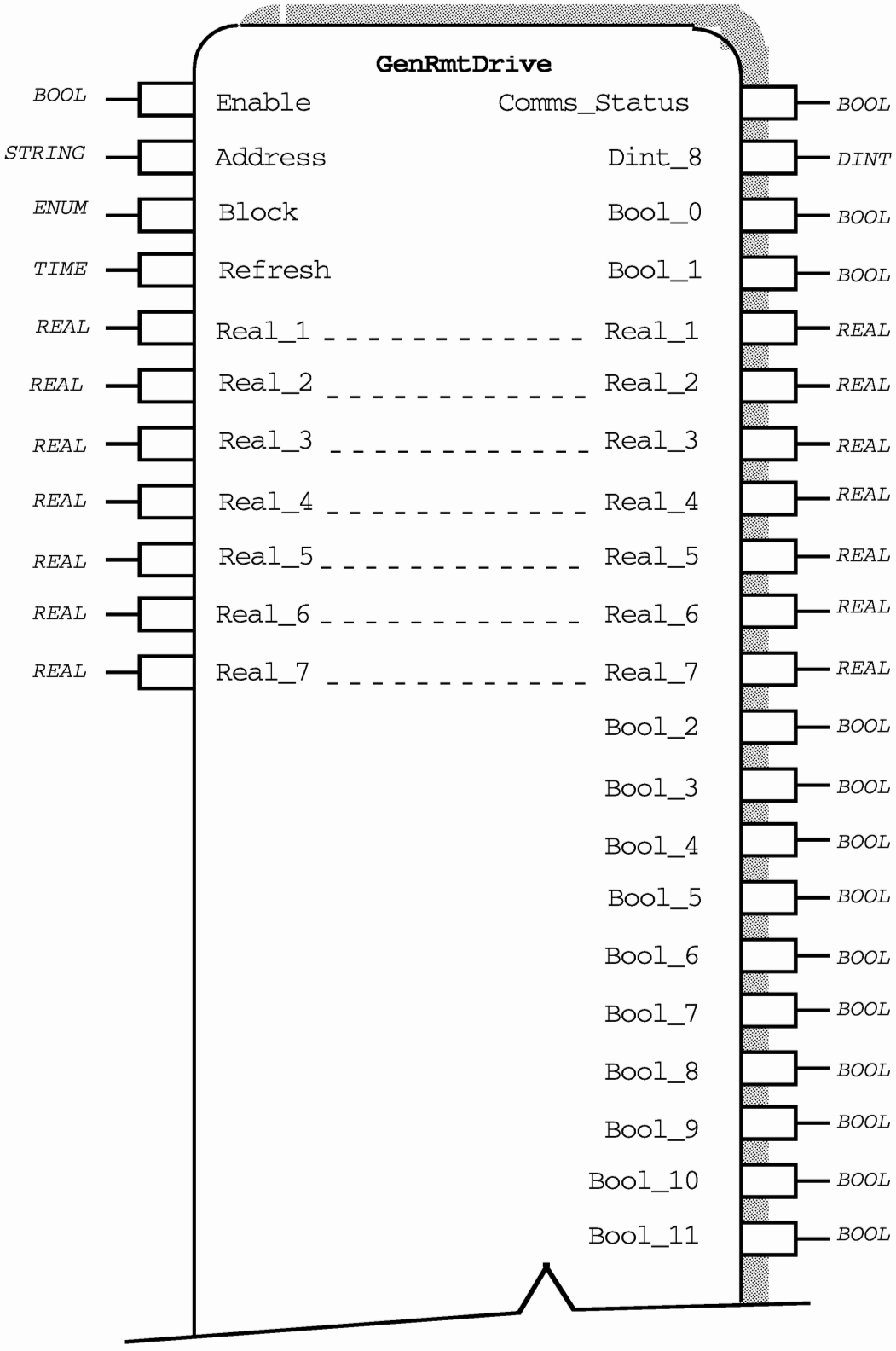

Figure 23-2 Generic Remote Drive 584 Function Block Diagram

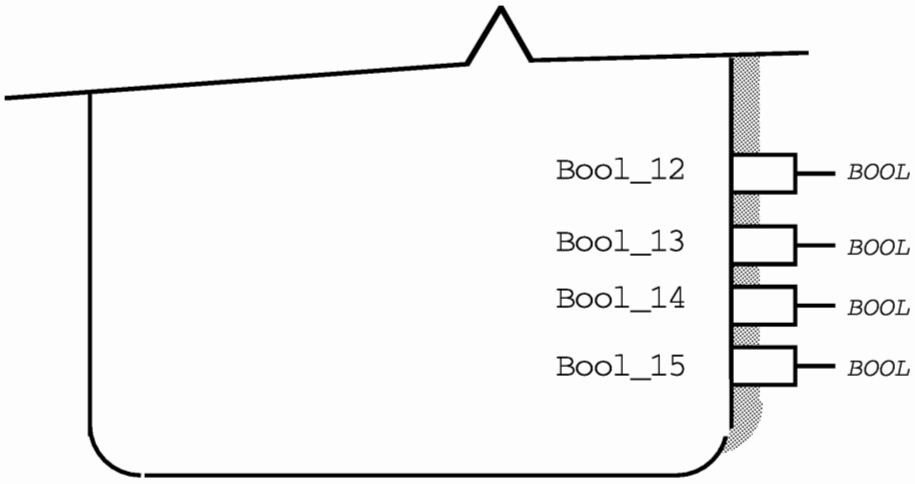

Figure 23-2 Generic Remote Drive 584 Function Block Diagram

Functional Description.

This is a generic communications function block which represents the PNO block format used in the AC and DC drives from Eurotherm Drives.

Specific function blocks are also available for interfacing to the 584 series AC drives and the 590 series DC drives. These provide a simple interface to those parameters which are commonly required.

Function Block Attributes

Type DC30

Class .....REMOTE_INSTR

Default Task .....Task_2

Short List .....Enable, Address, Block, Comms_Status

Memory Requirements .....1852 Bytes

Parameter Descriptions

Enable (EN)

This parameter is used to enable and disable the communications link. When **Enable** is set to **Enable (1)** the comms link will be active and the parameters will be polled.

Address (A)

This parameter defines the drive address. The address format is:

Port No. GID UID <space>

For example, an address of 0B12<space> identifies a drive with GID = 1 and UID = 2 connected to port B on the PC3000 LCM.

An EI Bisync Master function block must also be created for each communications port which will be used with a remote instrument function block.

Block (BLK)

This parameter defines the number of the PNO block being addressed. This block number can be changed on-line, so a single GenRmtDrive function block can be used to access a range of PNO blocks.

If any of the parameters in a block are not available, the **Comms_Status**will be set to FAULT (0).

Refresh (R)

This input defines the rate at which the parameters will be read from the remote drive. All writes to the drive take place immediately when an input value changes. If the drive is removed from the link or is powered off then Enable should be set to Disable (0) or Refresh should be set to a long refresh time to prevent the EI Bisync Master function block wasting time and comms bandwidth with continuous retries.

Real_1 (R1) to Real_7 (R7)

These input output parameters show the current values of the seven real parameters defined for the PNO block specified by the Block input. As far as PC3000 is concerned these parameters are read/write, but the remote drive may prevent writes to certain parameters.

Comms_Status (S)

If all the parameters in the PNO block are being successfully polled, **Comms_Status** will be set to OK (1). If any of the parameters defined in the PNO block are not available, or communications errors are detected, Comms_Status will be set to FAULT (1).

Dint_8

This parameter shows the value of the status integer which is associated with the PNO block specified by the Block input. This status word is also split into the sixteen individual bits. This parameter is read only. If a particular bit is to be written to a **Remote_Bool** or **Remote_SW** function block should be used.

Bool_0 (B0) to Bool_15 (B15)

These outputs show the values of the individual bits of the status word shown by the output **Dint_8.**

Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Enable	**BOOL**	Disable (0)			Senses	Disable (0) Enable (1)
Address	**STRING**	'OAOO'			Max 5 characters	
Block	**ENUM**	1 (1)			Senses	0 (0) 1 (1) 2 (2) 3 (3) 4 (4) 5 (5) 6 (6) 7 (7) 8 (8) 9 (9) A (10) B (11) C (12) D (13) E (14) F (15)
Refresh	**TIME**	10s			High Limit Low Limit	123d23h59m59s999 0
Real_1 to Real_7	**REAL**	0			High Limit Low Limit	3.402823e+38 -3.402823e+38
Comms_Status	**BOOL**	FAULT (0)			Senses	FAULT (0) Ok (1)
Dint_8	**DINT**	0			Senses	Off (0) On (1)

Table 23-2 GenRmDrive Parameter Attributes

RMTDRIVE584 FUNCTION BLOCK

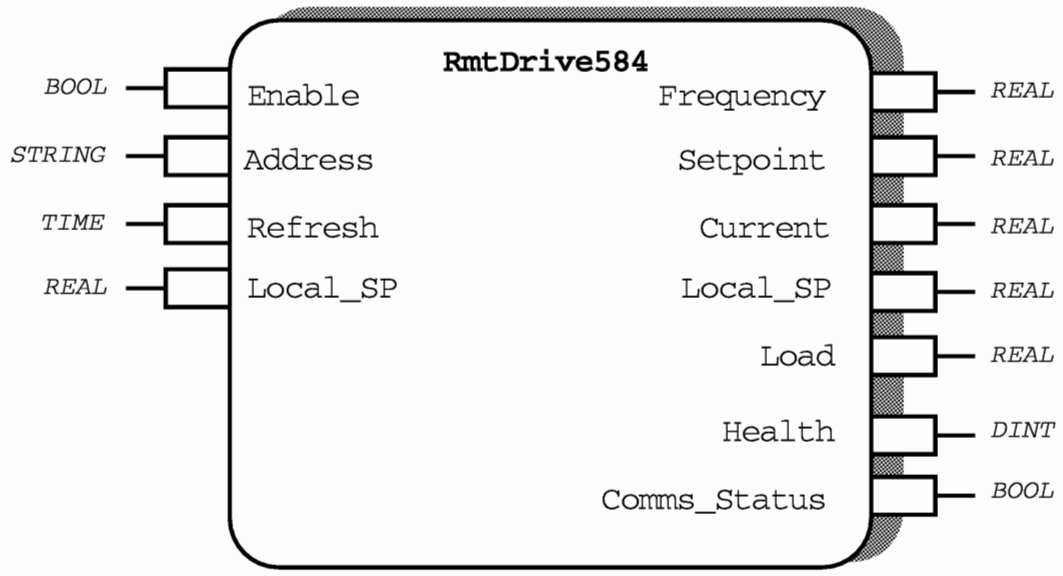

Figure 23-3 Remote 584 Drive Function Block Diagram

Functional Description.

This function block provides a simple interface to a Eurotherm Drives 584 series AC drive and gives access to the most common parameters. If other parameters are needed, the **GenRmtDrive** function block should be used to directly access the PNO block number containing the parameter required.

Specific function blocks are also available for interfacing to the 584 series AC drives and the 590 series DC drives. These provide a simple interface to those parameters which are commonly required.

Function Block Attributes

Type DC36

Class .....REMOTE_INSTR

Default Task .....Task_2

Short List .....Enable, Address, Frequency, Setpoint

Memory Requirements .....1396 Bytes

Parameter Descriptions

Enable (EN)

This parameter is used to enable and disable the communications link. When **Enable** is set to **Enable (1)** the comms link will be active and the parameters will be polled.

Address (A)

This parameter defines the drive address. The address format is:

Port No. GID UID <space>

For example, an address of 0A34<space> identifies a drive with GID = 3 and UID = 4 connected to port A on the PC3000 LCM.

An EI Bisync Master function block must also be created for each communications port which will be used with a remote instrument function block.

Refresh (R)

This input defines the rate at which the parameters will be read from the remote drive. All writes to the drive take place immediately when an input value changes. If the drive is removed from the link or is powered off then **Enable** should be set to **Disable (0)** or **Refresh** should be set to a long refresh time to prevent the EI Bisync Master function block wasting time and comms bandwidth with continuous retries.

Frequency (PV)

This output shows the current frequency output of the drive if **Comms_Status** is OK (1) This output corresponds to mnemonic 0B and is read only. The value is read as a percentage.

Setpoint (SP)

This output shows the current speed setpoint of the drive if **Comms_Status** is read as a percentage.

Local_SP (SL)

This input/output shows the current value of the serial setpoint if **Comms_Status** is OK (1). This parameter corresponds to mnemonic 26 and can be written to if it has been write enabled in the drive. The value is expressed as a percentage.

Current (I)

This output shows the drive motor current if **Comms_Status** is OK (1). This parameter corresponds to mnemonic 08 and is read only. The value is expressed as a percentage.

Load (L)

This output shows the drive motor load if **Comms_Status** is OK (1). This parameter corresponds to mnemonic 09 and is read only. The value is expressed as a percentage.

Health (H)

This output shows the drive health word if **Comms_Status** is OK (1). This parameter corresponds to mnemonic 0F and is read only.

Comms_Status (S)

If all the parameters are being read without any communications errors , the **Comms_Status** output will be set to OK (1). If communications errors are detected, **Comms_Status** will be set to FAULT (0).

Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Enable	**BOOL**	Disable (0)			Senses	Disable (0) Enable (1)
Address	**STRING**	'OAOO'			Max 5 characters	
Refresh	**TIME**	10s			High Limit Low Limit	23d23h59m59s999 0
Real_1 to Real_7	**REAL**	0			High Limit Low Limit	3.402823e+38 -3.402823e+38
Comms_Status	**BOOL**	FAULT (0)			Senses	FAULT (0) Ok (1)
Dint_8	**DINT**	0			Senses	Off (0) On (1)

Table 23-3 RmDrive 584 Parameter Attributes

RMTDRIVE590 FUNCTION BLOCK

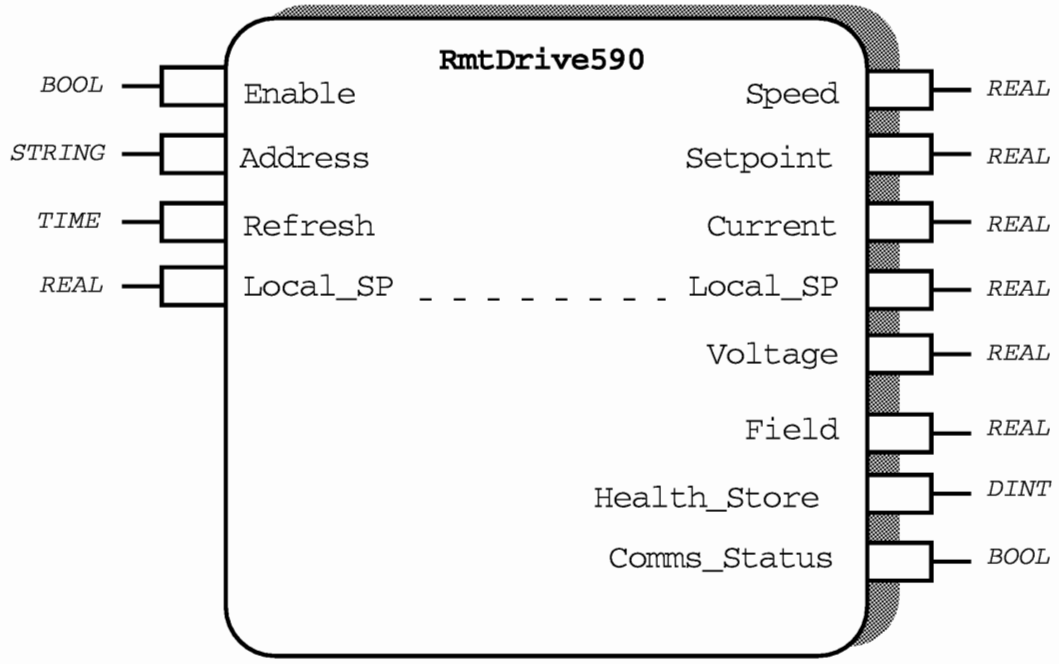

Figure 23-4 Remote 590 Drive Function Block Diagram

Functional Description.

This function block provides a simple interface to a Eurotherm Drives 590 series DC drive and gives access to the most common parameters. If other parameters are needed, the **GenRmtDrive** function block should be used to directly access the PNO block number containing the parameter required.

Function Block Attributes

Type DC38

Class .....REMOTE_INSTR

Default Task .....Task_2

Short List .....Enable, Address, Speed, Setpoint

Memory Requirements .....1602 Bytes

Parameter Descriptions

Enable (EN)

This parameter is used to enable and disable the communications link. When **Enable** is set to **Enable (1)** the comms link will be active and the parameters will be polled.

Address (A)

This parameter defines the drive address. The address format is:

Port No. GID UID <space>

For example, an address of 1C56<space> identifies a drive with GID = 5 and UID = 6 connected to port C on an ICM in slot 1 of the PC3000 rack.

An EI Bisync Master function block must also be created for each communications port which will be used with a remote instrument function block.

Refresh (R)

This input defines the rate at which the parameters will be read from the remote drive. All writes to the drive take place immediately when an input value changes. If the drive is removed from the link or is powered off then **Enable** should be set to **Disable (0)** or **Refresh** should be set to a long refresh time to prevent the EI Bisync Master function block wasting time and comms bandwidth with continuous retries.

Speed (PV)

This output shows the current drive speed if **Comms_Status** is OK (1) This output corresponds to mnemonic 0A (speed feedback) and is read only.

Setpoint (SP)

This output shows the current speed setpoint of the drive if **Comms_Status** is OK (1) This output corresponds to mnemonic 08 and is read only.

Local_SP (SL)

This input/output shows the current value of the serial link setpoint if **Comms_Status** is OK (1). This parameter corresponds to mnemonic 34 (ramp input) and can be written to if it has been write enabled in the drive. The value is expressed as a percentage.

Current (I)

This output shows the drive motor current if **Comms_Status** is OK (1). This parameter corresponds to mnemonic 08 and is read only. The value is expressed as a percentage.

Load (L)

This output shows the drive motor load if **Comms_Status** is OK (1). This parameter corresponds to mnemonic 09 and is read only.

Current (I)

This output shows the drive motor current if **Comms_Status** is OK (1). This parameter corresponds to mnemonic 0C (current feedback) and is read only.

Voltage (V)

This output shows the motor back if **Comms_Status** is OK (1). This output corresponds to mnemonic 20 and is read only.

Field (F)

This output shows the motor field feedback if **Comms_Status** is OK (1). This output corresonds to mnemonic 0E and is read only.

Health_Store (HS)

This output shows the drive health store if **Comms_Status** is OK (1). This output corresonds to mnemonic 1F and is read only.

Comms_Status (S)

If all the parameters are being read without any communications errors , the **Comms_Status** output will be set to OK (1). If communications errors are detected, **Comms_Status** will be set to FAULT (0).

Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Enable	**BOOL**	Disable (0)			Senses	Disable (0) Enable (1)
Address	**STRING**	'OAOO'			Max 5 characters	
Refresh	**TIME**	10s			High Limit Low Limit	23d23h59m59s999 0
Speed	**REAL**	0			High Limit Low Limit	3.402823e+38 -3.402823e+38
Setpoint	**REAL**	0			High Limit Low Limit	3.402823e+38 -3.402823e+38
Local_SP	**REAL**	0			High Limit Low Limit	3.402823e+38 -3.402823e+38
Current	**REAL**	0			High Limit Low Limit	3.402823e+38 -3.402823e+38
Voltage	**REAL**	0			High Limit Low Limit	3.402823e+38 -3.402823e+38
Load	**REAL**	0			High Limit Low Limit	3.402823e+38 -3.402823e+38
Field	**REAL**	0			High Limit Low Limit	3.402823e+38 -3.402823e+38
Health_Store	**DINT**	0			High Limit Low Limit	2147483646 -2147483647
Comms_Status	**BOOL**	FAULT (0)			Senses	FAULT (0) Ok (1)

Table 23-4 RmDrive 590 Parameter Attributes

RMTTU1400 FUNCTION BLOCK

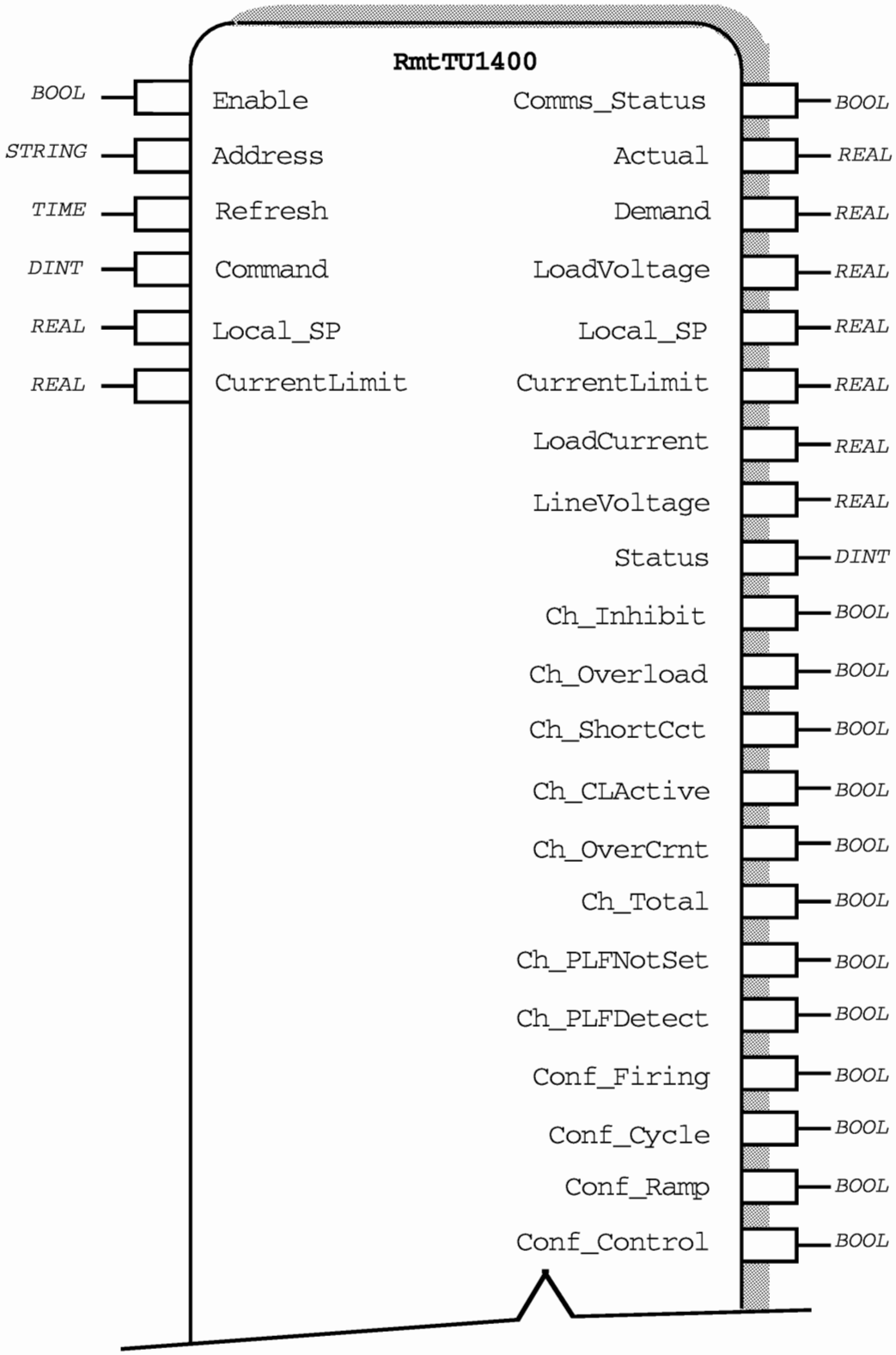

Figure 23-5 Remote TU1400 Function Block Diagram (continued)

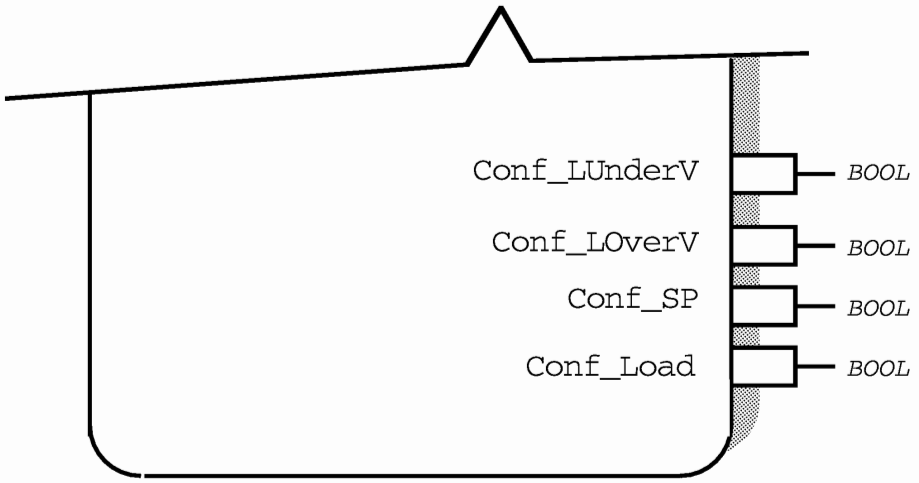

Figure 23-5 Remote TU1400 Function Block Diagram

Functional Description.

This function block provides a simple EI Bisync ASCII communications link to a Eurotherm TU1400 series thyristor stack. It provides a simple function block interface to the most commonly used parameters.

There must be one instance of the **RmTU1400** function block for each individual stack. To interface to the quad stack, four instances of the function block must be created.

Function Block Attributes

Type DC40

Class ..... REMOTE_INSTR

Default Task ..... Task_2

Short List ..... Enable, Address, Actual, Demand

Memory Requirements ..... 2002 Bytes

Parameter Descriptions

Enable (EN)

This parameter is used to enable and disable the communications link. When **Enable** is set to **Enable (1)** the comms link will be active and the parameters will be polled.

Address (A)

This parameter defines the drive address. The address format is:

Port No. GID UID <space>

For example, an address of 0B05<space> identifies a drive with GID = 0 and UID = 5 connected to port B on the PC3000 LCM. The remaining three stacks in the quad will have addresses 0B06, 0B07 and 0B08.

An EI Bisync Master function block must also be created for each communications port which will be used with a remote instrument function block.

Refresh (R)

This input defines the rate at which the parameters will be read from the remote drive. All writes to the drive take place immediately when an input value changes. If the drive is removed from the link or is powered off then **Enable** should be set to **Disable (0)** or **Refresh** should be set to a long refresh time to prevent the EI Bisync Master function block wasting time and comms bandwidth with continuous retries.

Command (CMD)

This parameter is the command word CW and is a write only parameter. In some instances all four stacks in the quad are affected by this command word. In other instances only the individual stack is affected. In some cases the effcts of a write can be read back in the **Status** output. Possible values for the command word include:

0	-Inhibits all four stacks in the quad
1	-Inhibits the individual stack
2	-Enables all four stacks in the quad
3	-Enables the individual stack
4	-Acknowledges alarms
5	-Sets PLF
6	-Control on V * I
7	-Control on V squared
8	-PA firing (analogue stacks only

9	-Burst firing soft start
10	-Burst firing single cycle
11	-Burst firing fast cycle

Comms_Status (S)

If all the parameters are being read without any communications errors , the **Comms_Status** output will be set to OK (1). If communications errors are detected, **Comms_Status** will be set to FAULT (0).

Actual (PV)

This output shows the calculation of the selected control feedback, either V * I of V squared. The parameter corresponds to the mnemonic PV and is read only.

Demand (OP)

This output shows the demand on the stack if **Comms_Status** is Ok (1). The parameter corresponds to the mnemonic OP and is read only.

Load Voltage (VV)

This output shows the load voltage if **Comms_Status** is OK (1). This parameter corresponds to mnemonic VV and is read only.

LoadCurrent (CV)

This output shows the actual current in the load if **Comms_Status** is OK (1). This parameter corresponds to mnemonic CV and is read only.

LineVoltage (LV)

This output shows the line voltage applied to the stack if **Comms_Status** is OK (1). This output corresponds to mnemonic LV and is read only.

Status (SW)

This output shows the status word for the stack if **Comms_Status** is Ok (1). The parameter corresponds to the mnemonic SW and is read only. The command input can be used to change the stack settings. The individual bits of the status word are decoded into simple boolean parameters listed below.

Ch_Inhibit (INH)

This output shows whether or not the channel is enabled and corresponds to the flag FGINH. Possible values are:

Enable (0)

Inhibit (1)

Ch_Overload (OVL)

This output shows the overload status and corresponds to the flag FGOVL. Possible values are:

Ok (0)

Overld (1)

Ch_ShortCct (SCT)

This output shows whether or not the stack is in a short circuit condition and corresponds to the flag FGSTL. Possible values are:

Ok (0)

ShortCt (1)

Ch_CLActive (CLA)

This output is set if the stack is in current limit and corresponds to the flag FGIMI. Possible values are:

Ok (0)

I_Limit(1)

Ch_OverCrnt (OCT)

This output is set if the stack is passing excessive current and corresponds to the flag FGOVC. Possible values are:

Ok (0)

Over_I(1)

Ch_TotalLF (TLF)

This output is set if there has been a total load failure and corresponds to the flag FGTLF. Possible values are:

Ok (0)

TotalLF (1)

Ch_PLFNotSet (PNS)

This output whether or not a partial load failure (PLF) detection is enabled and corresponds to the flag FGNPLF. Possible values are:

NotSet (0)

Ok (1)

Ch_PLFDetect (PLF)

This output is set if partial load failure (PLF) is detected and corresponds to the flag FGPLF. Possible values are:

Ok (0)

PLFDet (1)

Conf_Firing (CF)

This output indicates the firing mode and corresponds to the flag FGPA. Possible values are:

Cycle (0) for cycle firing

Phase (1) for phase angle firing

Conf_Cycle (CCY)

This output corresponds to the flag FGLTO. Possible values are:

Single (0) for single cycle

Fast (1) for fast cycle

Conf_Firing (CF)

This output indicates the firing mode and corresponds to the flag FGPA. Possible values are:

Cycle (0) for cycle firing

Phase (1) for phase angle firing

Conf_Ramp (CR)

This output indicates the ramping mode and corresponds to the flag FGRAMP. Possible values are:

Pure (0) for Pure Cycle mode

Soft (1) for soft start mode

Conf_Control (CC)

This output indicates the control mode and corresponds to the flag FGRUGU. Possible values are:

V2 (0) for V squared control

VxI (1) for V * I control

Conf_LUnderV (CLU)

This output indicates an under voltage condition on the supply line and corresponds to the flag FGUNDV. Possible values are:

Off (0) Voltage is Ok

On (1) an under voltage condition has been detected

Conf_LOverV (CLO)

This output indicates an over voltage condition on the supply line and corresponds to the flag FGUOVV. Possible values are:

Off (0) Voltage is Ok

On (1) an over voltage condition has been detected

Conf__SP`(CSP)

This output indicates the source of the setpoint and corresponds to the flag FGAN. Possible values are:

Analog (0) working off the analog setpoint

Digital (1) working off the digital comms setpoint

Conf__Load (CLD)

This output indicates the mode for partial load detection (PLF) and corresponds to the flag FGIR Possible values are:

Res_Ld (0) PLF detection set for resistive load

Inf_Ld (0) PLF detection set for infra red load

Local_SP (SL)

This input/output is used to set the required output from the stack and corresponds to the mnemonic SL This is a read/write parameter.

CurrentLimit (CL)

This input/output is used to set the maximum current from the stack and corresponds to the mnemonic CL This is a read/write parameter and is expressed as a percentage of the stack rating.

Parameter Attributes

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Enable	**BOOL**	Disable (0)			Senses	Disable (0) Enable (1)
Address	**STRING**	'OAOO'			Max 5 characters	
Refresh	**TIME**	10s			High Limit Low Limit	23d23h59m59s999 0
Command	**DINT**	0			High Limit Low Limit	2147483646 -2147483647
Comms_Status	**BOOL**	FAULT (0)			Senses	FAULT (0) Ok (1)
Actual	**REAL**	0			High Limit Low Limit	+3.402823e+38 -3.402823e+38
LocalVoltage	**REAL**	0			High Limit Low Limit	+3.402823e+38 -3.402823e+38
LoadCurrent	**REAL**	0			High Limit Low Limit	+3.402823e+38 -3.402823e+38
LineVoltage	**REAL**	0			High Limit Low Limit	+3.402823e+38 -3.402823e+38
Status	**DINT**	0			High Limit Low Limit	2147483646 -2147483647
Ch_Inhibit	**BOOL**	Enable (0)			Senses	Enable (0) Inhibit (1)
Ch_Overload	**BOOL**	Ok (0)			Senses	Ok (0) OverLd (1)
Ch_ShortCct	**BOOL**	Ok (0)			Senses	Ok (0) ShortCt (1)
Ch_ClActive	**BOOL**	Ok (0)			Senses	Ok (0) I_Limit (1)
Ch_OverlCrnt	**BOOL**	Ok (0)			Senses	Ok (0) Over_I (1)

Table 23-5 RmTU1400 Parameter Attributes (Continued)

Name	Type	Cold Start	Read Access	Write Access	Type Specific Information	
Ch_TotalLF	**BOOL**	Ok (0)			Senses	Ok (0) TotalLF(1)
Ch_PLFNotSet	**BOOL**	NotSet0)			Senses	NotSet 0) Ok (1)
Ch_PLFDetect	**BOOL**	Ok (0)			Senses	Ok (0) PLFDet 1()
Conf_Firing	**BOOL**	Cycle (0)			Senses	Cycle (0) Phase (1)
Conf_Cycle	**BOOL**	Single 0)			Senses	Single (0) Phase (1)
Conf_Ramp	**BOOL**	Pure (0)			Senses	Pure (0) Soft (1)
Conf_Control	**BOOL**	V2 (0)			Senses	V2 (0) Vxl (1)
Conf_LUnderV	**BOOL**	Off (0)			Senses	Off (0) On (1)
Conf_LOverV	**BOOL**	Off (0)			Senses	Off (0) On (1)
Conf_SP	**BOOL**	Analog (0)			Senses	Analog (0) Digital (1)
Conf_Load	**BOOL**	Res_Ld (0)			Senses	Res_Ld (0) Inf_Ld (1)
Local_SP	**REAL**	0			High Limit Low Limit	+3.402823e+38 -3.402823e+38
CurrentLimit	**REAL**	0			High Limit Low Limit	+3.402823e+38 -3.402823e+38

Table 23-5 RmTU1400 Parameter Attributes