Inhaltsverzeichnis

DEVICE ABSCNT

1. Introduction

The internal ABSCNT device manages the acquisition and manipulation of the position from absolute sensors. These sensors are typically absolute encoders with different types of output interface (parallel, SSI, etc.) The main features of the device are:

- control of the data quality from the transducer
- support for binary or gray encoding data
- sexagesimal representation of read data (angles in degrees and early)
- internal zero for the absolute position
- generating an incremental count to be used by other devices

2. Declaration

For use the device you must declare it in the INTDEVICE section of the unit configuration.

```
;--------------------------------
; Internal devices Declaration
;--------------------------------
INTDEVICE
...
<nome>  ABSCNT  TCamp  IAbsCont  ICont
```

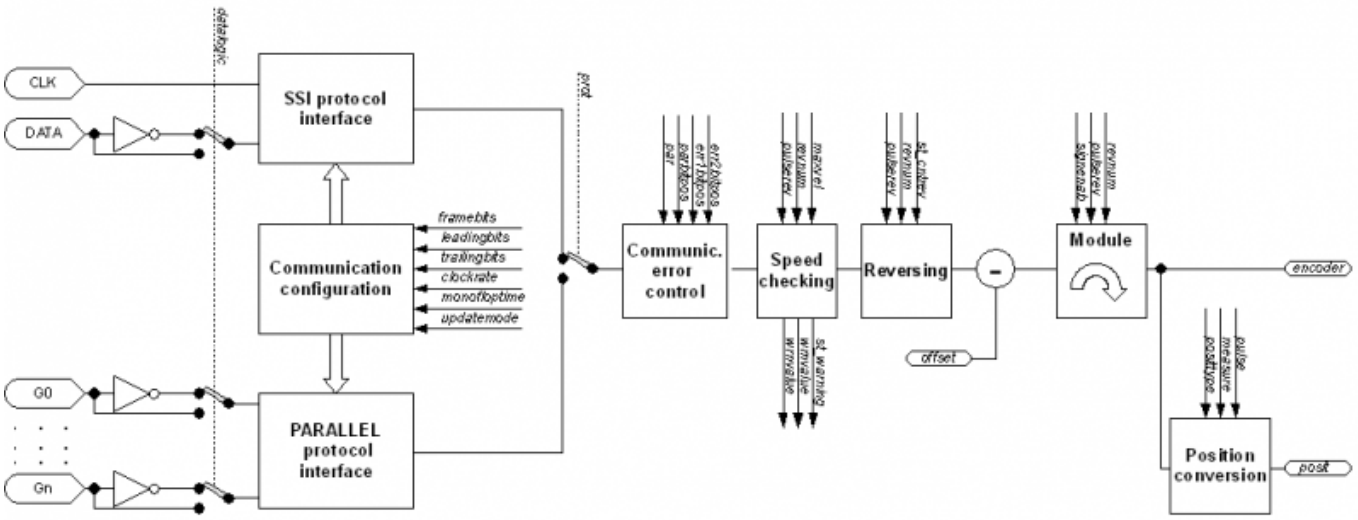
Dove:

Field name	Description	Example	Note
<nome>	Device name	Axe	-
ANPOS2	Keyword that identifies the device ABSCNT	-	-
TCamp	Device sampling time in milliseconds	4	-
IAbsCont	Absolute counter number (Verify the HW documentation of the product for the correct value to set)	1	
ICont	Incremental counter address generated by the device (always 1.CNTx)	1.CNT01	If entering the value X. X field is ignored

All fields of the Declaration are mandatory and must be present on the same line. Set „X.X“ or „X“ if a resource is not available or cannot be used. Disable a resource means disable all functionality of the devices that use it.

3. Operation

Operation of the device is illustrated with the following diagram:



3.1 Communication configuration

The „Communication configuration“ block Configure Protocol blocks appropriately in accordance with the number of bits to be captured, with the number of bits to „discard“, with the capture mode, etc.

3.2 SSI protocol interface

The „SSI protocol interface“ block executes the acquisition of data from a transducer with SSI protocol. The read data should then be manipulated to get information by absolute position.

3.3 Communication error control

The „Communication error control“ block does the control of the „quality“ of data acquired by the transducer. Controls can be equal and/or, for transducers that require it, the verification of certain bits of error present in the frame.

3.4 Speed checking

The „Speed checking“ block check the rotational speed in RPM compared to the maximum and shall report any overshoot. His task is to detect errors in the acquisition of the data.

3.5 Reversing

The „Reversing“ block manages the reversal of direction of rotation that causes the increase in location determined by*st_cntdir*.

3.6 Module

The „Module“ block manipulates the position acquired and subtracts the offset to bring it back within the range 0÷(*pulserev* x *revnum*) quando *signenab* be worth 0 and within the range -(*pulserev* x *revnum*)/2 ÷ (*pulserev* x *revnum*)/2 when *signenab* be worth 1.

3.7 Position conversion

The „Position conversion“ block converts from value bits position at value position in units of measurement. The data obtained (*posit*) can have decimal or sexagesimal representation depending on the setting parameter *posittype*.

4. Notes on the device operation

- It is possible to use the device for generating a virtual counter by setting the address ICont on the device declaration; because is the „virtual“ counter you will always find in slot 1 (CPU ID). This feature makes it possible to use a translator of absolute type with counting and positioning devices that use incremental translators only (hardware resource CNTxx). Important: the „virtual“ counter will update each device or sampling every 1ms depending on the setting of the parameter value *updatemode*.
- When you set the sexagesimal representation the two least significant digits of the parameter *posit* indicate the 'minute', the other indicate the 'degrees'. With the sexagesimal representation, you must also set the parameters *pulse* and *measure* in particular on *measure* the value set must be in 'minute'. For example if we had an encoder with 10000 pulses and we wanted to get the angular position in 'degrees' and 'minutes' should set *pulse*=10000 and *measure*=360×60=21600.

5. Parameters list

5.1 prot

Short description	Protocol type
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	0÷0
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Defines the protocol type used for acquisition of position transducer:

0= SSI

5.2 framebits

Short description	SSI Bits frame number
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	1÷63
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Is the total number of bits that make up the SSI frame.

5.3 leadingbits

Short description	Non-significant bits in the SSI frame number
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	1÷15
Parameter ID	-
Write conditions	st_updenab = 0

Description:

It is the number of bits, starting from the MSbit, which are meaningless for the reconstruction of the given by the transducer.

5.4 trailingbits

Short description	The frame number insignificant SSI frame queued
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	1÷15
Parameter ID	-
Write conditions	st_updenab = 0

Description:

It is the number of bits, starting from the LSbit, which are meaningless for the reconstruction of the given position from the transducer.

5.5 codetype

Short description	Data code
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	0÷1
Parameter ID	-
Write conditions	st_updenab = 0

Description:

It is the type of encoding of the data acquired by the position transducer:

0: Binary code
1: Gray code

5.6 datalogic

Short description	Logical data type
Dimension	Byte
Default value	Retentive
Access type	Read
Unit measure	-
Valid range	0÷1
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Indicates the type of data captured by the transducer position:

0: normal
1: inverse

5.7 par

Short description	Parity check
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	0÷2
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Indicates the type of parity check on SSI data:

0: disable
1: odd parity
2: even parity

5.8 parbitpos

Short description	Bit position equal
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	0÷31
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Location of parity within the frame. This parameter is meaningful only if *par* > 0.

5.9 err1pos

Short description	Bit position error 1
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	0÷31
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Bit position 1 error within the frame. Parameter that is currently not implemented.

5.10 err2pos

Short description	Bit position error 2
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	0÷31
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Bit position 1 error within the frame. Parameter that is currently not implemented.

5.11 updatemode

Short description	Scan mode data
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	0÷1
Parameter ID	-
Write conditions	st_updenab = 0

Description:

It is the temporal mode of acquisition of the transducer data:

0: each sample time device ABSCNT
1: continuous

5.12 clockrate

Short description	Clock frequency used from the SSI protocol
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	0÷3
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Select the clock frequency used in SSI protocol:

0: 1MHz
1: 500KHz
2: 250KHz
3: 125KHz

5.13 monofloptime

Short description	Monoflop time
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	uS (microseconds)
Valid range	0÷127
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Indicates the time in monoflop microseconds. This is the time that waits between two acquisitions with SSI protocol, when updating the data is continuous(*updatemode* = 1). The set value will be rounded up to a multiple of the period of clock frequency (inverse of *clockrate*). If the value set is not obtainable from the device because they are too big and reports a warning.

5.14 pulserev

Short description	Number of positions per revolution
Dimension	Long
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	1÷999999
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Number of positions per revolution of the transducer (plate data).

5.15 revnum

Short description	Number of turn
Dimension	Word
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	1÷999999
Parameter ID	-
Write conditions	st_updenab = 0

Description:

It is managed by the transducer speed shown on the rating plate data. The value is significant when using multi transducers, for the transducers singleturn set the value 1.

5.16 signenab

Short description	Sign enabling
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	0÷1
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Enables the interpretation of data acquired from the transducer with sign.

0: only positive position
1: positive and negative position

5.17 posittype

Short description	Representation posit parameter type
Dimension	Byte
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	0÷1
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Defines the representation type of the value of the parameter position *posit*:

0: decimal
1: sexagesimal (degrees and minutes)

5.18 measure

Short description	Reference measure for the position factor calculating
Dimension	Long
Default value	Retentive
Access type	Read - Write
Unit measure	Um
Valid range	1÷999999
Parameter ID	-
Write conditions	

Description:

Indicates the space, in units of measurement, routes to get primary impulses set in pulse parameter. This parameter is used to calculate the conversion factor between primary impulses and units.

posit = (encoder · measure) / pulse

The ratio measure/pulse must be a value between 0.00935 and 1.

5.19 pulse

Short description	Number of impulses for calculating the position factor
Dimension	Long
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	1÷999999
Parameter ID	-
Write conditions	-

Description:

Indicates the number of pulses (1 encoder pulse = 4 primary pulses) that will generate the transducer in both directions to get a movement of *measure*. This parameter is used to calculate the conversion factor between primary impulses and units.

posit = (encoder · measure) / pulse

The ratio measure/pulse must be a value between 0.00935 and 1.

5.20 maxvel

Short description	Maximum speed
Dimension	Word
Default value	Retentive
Access type	Read - Write
Unit measure	RPM
Valid range	0÷32767
Parameter ID	-
Write conditions	st_updenab = 0

Description:

Indicates the maximum speed expressed in revolutions per minute (RPM) where to ride is the position value in units corresponding to the impulses that are defined in *pulserev*. This parameter is used to control the quality of the value acquired by the transducer; basically the device check that between two consecutive values obtained there is a change in position „consistent“ with the speed and that this variation does not exceed that which would be achieved when the transducer rotates the value set on the parameter. Setting value 0 disables the control.

5.21 encoder

Short description	Bit absolute position value
Dimension	Long
Default value	0
Access type	Read - Write
Unit measure	-
Valid range	-
Parameter ID	-
Write conditions	-

Description:

It is the bits value (encoder positions) of the transducer absolute position. The value assumed by this parameter starts from 0 to(*pulserev* · *revnum*) when *signenab* be worth 0 and it goes -(*pulserev*· *revnum*)/2 to (*pulserev* · *revnum*)/2 when *signenab* be worth 1.

5.22 posit

Short description	UM value in absolute position
Dimension	Long
Default value	Retentive
Access type	Read - Write
Unit measure	Um
Valid range	
Parameter ID	
Write conditions	-

Description:

It's the value expressed in units of absolute position of transducer. Is obtained by the following formula: *encoder · measure* / *pulse*.

5.23 par01

Short description	01 parameter
Dimension	Long
Default value	0
Access type	Read - Write
Unit measure	-
Valid range	
Parameter ID	-
Write conditions	-

Description:

Parameter 01. Not used, reserved for other use.

5.24 par02

Short description	02 parameter
Dimension	Long
Default value	0
Access type	Read - Write
Unit measure	-
Valid range	
Parameter ID	-
Write conditions	-

Description:

Parameter 02. Not used, reserved for other use.

5.25 par03

Short description	03 parameter
Dimension	Long
Default value	0
Access type	Read - Write
Unit measure	-
Valid range	
Parameter ID	-
Write conditions	-

Description:

Parameter 03. Not used, reserved for other use.

5.26 par04

Short description	04 parameter
Dimension	Long
Default value	0
Access type	Read - Write
Unit measure	-
Valid range	
Parameter ID	-
Write conditions	-

Description:

Parameter 04. Not used, reserved for other use.

5.27 ret01

Short description	retentive parameter 01
Dimension	Long
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	
Parameter ID	-
Write conditions	-

Description:

Retentive 01 parameter. Not used, reserved for other use.

5.28 ret02

Short description	retentive parameter 02
Dimension	Long
Default value	Retentive
Access type	Read - Write
Unit measure	-
Valid range	
Parameter ID	-
Write conditions	-

Description:

Retentive 02 parameter. Not used, reserved for other use.

5.29 errcode

Short description	Identification code of the error.
Dimension	Byte
Default value	0
Access type	Read
Unit measure	-
Valid range	-
Parameter ID	-
Write conditions	-

Description:

Indicates the type of error detected by the device. For more information see the section.

5.30 errvalue

Short description	Identifying the cause of the error code
Dimension	Byte
Default value	0
Access type	Read
Unit measure	-
Valid range	-
Parameter ID	-
Write conditions	-

Description:

Indicates the type of the error detected by the device. For more information see the section.

5.31 wrncode

Short description	Code warning identification
Dimension	Byte
Default value	0
Access type	Read
Unit measure	-
Valid range	
Parameter ID	-
Write conditions	-

Description:

Indicates the type of warning reported by device. For more information see the section.

5.32 wrnvalue

Short description	Identification code of the cause of the warning
Dimension	Byte
Default value	0
Access type	Read
Unit measure	-
Valid range	-
Parameter ID	
Write conditions	-

Description:

Indicates the cause of the warning reported by device. For more information see the section.

6. State lists

6.1 st_updenab

Short description	**Enabling status update**
Default value	0
Status ID	-

Description

Indicates that the acquisition of the data by the transducer is activated and adjusted by the parameter *updatemode*.

0 = acquisition disabled.
1 = acquisition enabled.

6.2 st_cntrev

Short description	**State of counterclockwise to increase the count.**
Default value	Retentive
Status ID	-

Description

Indicates the direction of rotation that causes the increase of the counter.

0 = clockwise.
1 = counterclockwise.

6.3 st_warning

Short description	**Warning presence**
Default value	0
Status ID	-

Description

Indicates the status of warning, to recognize the type of warning you must refer to *wrncode* and *wrnvalue* variables.

0 = warning not present.
1 = warning present.

6.4 st_error

Short description	**There is an error.**
Default value	0
Status ID	

Description

Indicates the error status of the device, in order to recognize the type of error you must refer to *errcode* and *errvalue* variables.

0 = error not present.
1 = error present.

6.5 st_01

Short description	**Generic status 1**
Default value	0
Status ID	-

Description

Available for future use.

6.6 st_02

Short description	**Generic status 2**
Default value	0
Status ID	-

Description

Available for future use.

6.7 st_03

Short description	**Generic status 3**
Default value	0
Status ID	-

Description

Available for future use.

6.8 st_04

Short description	**Generic status 4**
Default value	0
Status ID	-

Description

Available for future use.

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7. Commands List

7.1 UPDENAB

Short description	**Enabling update count.**
Condition	st_updenab = 0
Default value	
Command ID	-

Description

Enable the acquisition of position from the transducer according to the *updatemode* parameter.

7.2 UPDDISAB

Short description	**Disabling update count.**
Condition	st_updenab = 1
Default value	
Command ID	-

Description

Disable the transducer position acquisition. With update disabled you can modify communication parameters.

7.3 CNTREV

Short description	**Count increment counterclockwise direction.**
Condition	st_updenab = 0
Default value	
Command ID	-

Description

Sets the direction by which to increment the count to counterclockwise.

7.4 CNTDIR

Short description	**Time count increment direction.**
Condition	st_updenab = 0
Default value	
Command ID	-

Description

Sets the direction by which to increment the count for clockwise.

7.5 RSERR

Short description	**State error reset.**
Condition	st_error = 1
Default value	
Command ID	-

Description

State error reset (*st_error*) if no longer on the error condition.

7.6 RSWRN

Short description	**Warning state reset.**
Condition	st_warning = 1
Default value	
Command ID	-

Description

Reset the *st_warning* state.

7.7 CMD01

Short description	**Generic command 1.**
Condition	-
Default value	
Command ID	-

Description

Available for future use.

7.8 CMD02

Short description	**Generic command 2.**
Condition	-
Default value	
Command ID	-

Description

Available for future use.

7.9 CMD03

Short description	**Generic command 3.**
Condition	-
Default value	
Command ID	-

Description

Available for future use.

7.10 CMD04

Short description	**Generic command 4.**
Condition	-
Default value	
Command ID	-

Description

Available for future use.

8. Errors and Warnings

8.1 Errors

When the device fails to perform operations are caused by incorrect programming by the user reports this condition through activation of the *st_error* state. The device makes available, through the*errcode*and*errvalue*parameters, some information for a better understanding of the type of error and which condition generated it. This information and the error state*st_error*persist until you run the*RSERR*command that deletes them. The following table specifies the values assumed by *errcode*:

errcode	**Description**
0	No error
1	Generic error
2	Hardware error: the hardware does not support absolute counter.

Through the *errvalue* parameter you can get more detailed information about the error.
Currently, the*errvalue*parameter is not used and is always 0.

8.2 Warnings

When setting a parameter of device is not accepted or when a command cannot execute the device reports this condition through activation of the State*st_warning*. The device makes available, through the*wrncode*and*wrnvalue*parameters, some information to better understand the type of warning and which condition generated it.
This information and the status of warning*st_warning*persist until you run the*RSWRN*command that deletes them.
The following table specifies the values assumed by *wrncode*:

wrncode	**Description**
0	No warning.
1	the parameter is accepted: writing about a parameter is not successful.
2	command not executed.
3	speed too high.
4	parity error.

Using the*wrnvalue*parameter you can get more detailed information about the warning.

wrnvalue	**Description**
0	no additional information about the warning.
1	operation is not enabled.
2	given out of range.