

Short instruction

3 axis counter card

ZP 059

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1 Installation

Address Selection

Before the ZP059 is built in to the PC it is necessary to check the address configuration. 32 addresses in the I/O-range of the PC are used. Interrupts or DMA channels are **not** used by the card.

The following base address configurations are available:



DIP-switch for the I/O-address selection, here 390 H

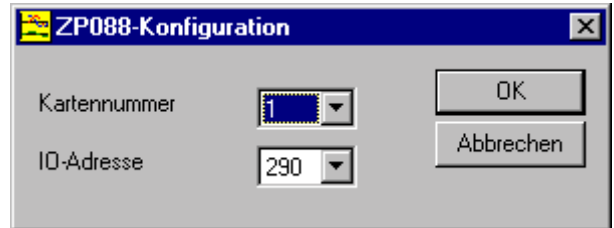
Address selection at the DIP-switch

Switch 1	Switch 2	Switch 3	Switch 4	I/O-Address
ON	ON	ON	ON	250 H
OFF	ON	ON	ON	260 H
ON	OFF	ON	ON	280 H
OFF	OFF	ON	ON	290 H
ON	ON	OFF	ON	2A0 H
OFF	ON	OFF	ON	2B0 H
ON	OFF	OFF	ON	2C0 H
OFF	OFF	OFF	ON	2D0 H
ON	ON	ON	OFF	2E0 H
OFF	ON	ON	OFF	330 H
ON	OFF	ON	OFF	340 H
OFF	OFF	ON	OFF	350 H
ON	ON	OFF	OFF	360 H
OFF	ON	OFF	OFF	390 H
ON	OFF	OFF	OFF	3E0 H

Factory setting : 290 H

2 Driver and Application Software

The Drivers for the operating systems Windows 95/98 and NT 4.0 are on the corresponding disk. The "setup.exe" installs the drivers on the PC. Within the setup routines the program "ZP088Cnf.exe" is started, which configures the card no. with the corresponding I/O-address, which is necessary for the software access to the card. If these parameters has to be changed after the driver installation, the program can be started without the complete setup.



The drivers can be used with two DLL's. The "HS_ZP3B.DLL" with the base functions is used to read out the pure counter value and the base status information. This DLL should be used only if someone wants to do his own signal interpretation.

In most applications **it will be useful to use the calls of the "HS_ZP3X.DLL"** with its extended functions like reference signal and stop signal interpretation.

Base Functions (HS_ZP3B.DLL)

DLL function call	Meaning
HS_ZP3B_Init	Initializes the card and the drivers
HS_ZP3B_GetVersion	Version of driver and DLL
HS_ZP3B_ReadCounter	Read out of one counter value and status information
HS_ZP3B_ReadAllCounter	Read out of all counter values and status information
HS_ZP3B_SetRefMode	Set the reference mode of a counter

The description is **not** available in English, because it will be better to use the extended function calls

Extended Function Calls (HS_ZP3X.DLL)

DLL function call	Meaning
HS_ZP3X_Initialize	Initializes the card and the driver
HS_ZP3X_GetVersion	Version of driver and DLL
HS_ZP3X_SetMode	Sets mode of reference and stop detection
HS_ZP3X_SetCounterMul	Sets a counter multiplier
HS_ZP3X_GetCounter	Read out of one counter with status information
HS_ZP3X_GetAllCounter	Read out of all counters with status information
HS_ZP3X_ResetCounterStop	Reset/release of the stop input

Initialization of the card

Function name: HS_ZP3X_Initialize

Syntax: **Visual C++:** long HS_ZP3X_Initialize(long CardNo)
Delphi: HS_ZP3X_Initialize(CardNo:longint):longint

Description: Loads the driver and checks whether a card is available and initializes the reference and stop parameters.

Parameter: **CardNo** Logical card no (1..15)
 The card with the lowest I/O-address is the logical number 1. And so on.

Return value: 0 OK
 -1 Error

Version

Function name: HS_ZP3X_GetVersion

Syntax:	Visual C++: long HS_ZP3X_GetVersion(char* DriverVersion, char* DllVersion)
	Delphi: HS_ZP3X_GetVersion(DriverVersion :pchar; DllVersion :pchar)
	:longint

Description:	Detects the version of driver and DLL
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Parameter:	DriverVersion	Pointer to the string of driver version.
	DllVersion	Pointer to the string of DLL version.
		The strings should have a minimum length of 80

Return value:	0	OK
	-1	error

Reference and stop mode configuration

Function name: HS ZP3X SetMode

Syntax:	Visual C++:	long HS_ZP3X_SetMode(long CardNo, long CounterNo, long RefMode, long StopMode);
	Delphi:	HS_ZP3X_SetMode(CardNo :longint; CounterNo :longint; RefMode :longint; StopMode :longint) :longint

Description: Sets the reference and stop mode.

Parameter:	CardNo	Logical card no (1..15)
	CounterNo	counter no (1..3)
	RefMode	0 No reference detection (Default) 1 one reference detection 2 multiple reference detection
	StopMode	0 no stop detection(Default) 1 manual stop 2 automatically stop
Return value:	0	OK
	-1	error

Read out of one counter

Function name: HS_ZP3X_GetCounter

Syntax:

```
Visual C++: long HS_ZP3X_GetCounter( long CardNo,  
                                     long CounterNo,  
                                     long *Count,  
                                     long *Status)
```

```
Delphi:      HS_ZP3X_GetCounter( CardNo      :longint;
                                CounterNo   :longint;
                                var Count    :longint;

                                var Status    :longint)
                                :longint;
```

Description: Read out of the counter value and the status of **one** counter.
The value is calculated with the reference value and the multiplier.

Parameter:	CardNo	Logical card no (1..15)
	CounterNo	Counter no (1..3)
	Count	Pointer to the counter value
	Status	Pointer to the counter status
		01h: Error
		02h: Reference already detected
		04h: counter stopped (latched)

Return Value:	0	OK
	-1	error

Read out of all counters

Function name: HS_ZP3X_GetAllCounter

Syntax: **Visual C++:** long HS_ZP3X_GetAllCounter(long CardNo,
long *Count1,
long *Status1,
long *Count2,
long *Status2,
long *Count3,
long *Status3)

Delphi: HS_ZP3X_GetAllCounter(CardNo :longint;
var Count1 :longint;
var Status1 :longint;
var Count2 :longint;
var Status2 :longint;
var Count3 :longint;
var Status3 :longint)
:longint;

description: Read out of the counter value and the status of **all** counters.
The value is calculated with the reference value and the multiplier.

Parameter:

CardNo	Logical card no (1..15)
Count1	Pointer to the counter value of counter 1
Status1	Pointer to the counter status of counter 1 01h: Error 02h: Reference already detected 04h: counter stopped (latched)
Count2	Pointer to the counter value of counter 2
Status2	Pointer to the counter status of counter 2 01h: Error 02h: Reference already detected 04h: counter stopped (latched)
Count3	Pointer to the counter value of counter 3
Status3	Pointer to the counter status of counter 3 01h: Error 02h: Reference already detected 04h: counter stopped (latched)

Return value:

0	OK
-1	error

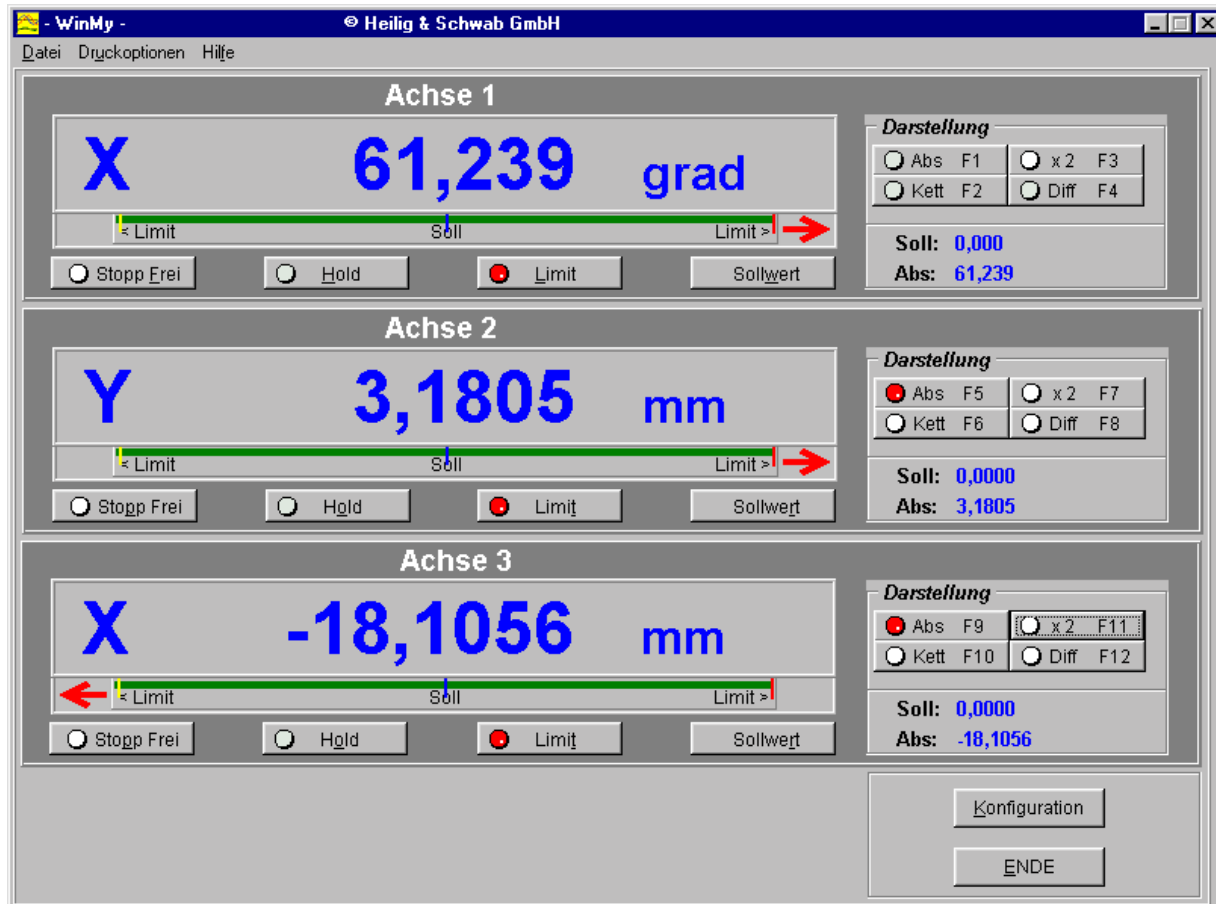
Reset/Release of the stop input**Function name:** HS_ZP3X_ResetCounterStop**Syntax:** **Visual C++:** long HS_ZP3X_ResetCounterStop(long CardNo,
long CounterNo)**Delphi:** HS_ZP3X_ResetCounterStop(CardNo :longint;
CounterNo :longint)
:longint;**Description:** Resets the stop mode of a counter. The counter then directly refreshes the value**Parameter:**
CardNo Logical card no (1..15)
CounterNo counter no (1..3)**Return value:**
0 OK
-1 error**Remark:** The release of the counter has to be done for each axis**Including the DLL to the application software**

The DLL is included via an interface module of the corresponding programming language, which contains the declarations for using the function calls.

This interface modul is on the driver disk for Visual C++ and for Borland Delphi. For other pragamming languages like Visual Basic this modul has to be created by the user.

Demo- and Measurement Program WinMy

The software "WinMy" is used for testing the counter card and allows the measurements with linear and rotary encoders. The surface is only in German available at this moment.



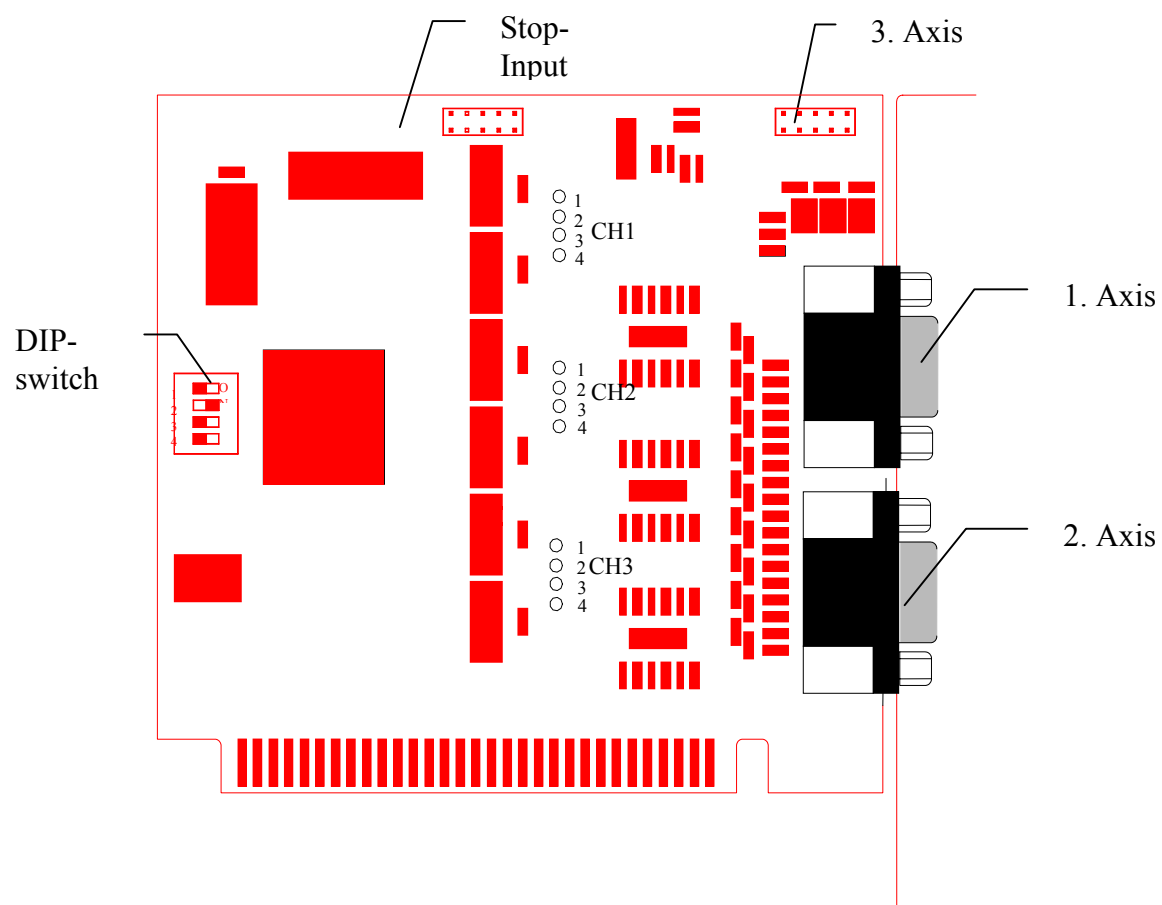
Surface of the demo software WinMy

3 Technical Specifications

Location of the input connectors

Two sensors (i.e. linear scales) are connected via 9 pole Sub-D connectors in the bracket of the board. The third is connected via a 10 pole connector on the board.

The stop (strobe) signals are connected via an additional 10 pole connector on the board. The selection of the base I/O-address is done with a DIP-Switch. The possible settings are described in the chapter "Installation".



Layout diagram of the ZP059

Electrical Specifications

Measurement Inputs:

The following signal specifications are valid for all axis.

Signal I_1 / I_2 : 7 - 15 μA_{PP} (sinusoidal)

Reference-Signal: 3,5 - 8 μA_{PP}

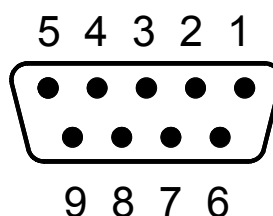
Phase angle I_1 / I_2 : $90^\circ \pm 10^\circ$

Amplitude ration : I_1 / I_2 : 1/0,8

Input frequency: 0 - 70 kHz, depending on the form of the input signal

PIN-Connection of the counter inputs: (Axis 1 / Axis 2):

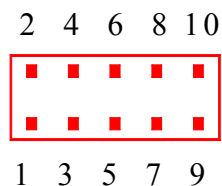
Pin	Signal
1	- I_1
2	GND
3	- I_2
4	GND
5	- REF
6	+ I_1
7	+ 5V
8	+ I_2
9	+ REF



PIN-Connection of the 9 pole Sub-D connectors of the counter inputs

PIN-Connection of the connector of the third Axis

PIN	Signal
1	- I_1
2	+ I_1
3	GND
4	+ 5V
5	- I_2
6	+ I_2
7	GND
8	+ REF
9	- REF
10	-



Physical and mechanical Specifications

Dimensions: 120 x 100 x 20 mm

Weight: about 140g (without cable)

Storage temperature: - 30° to + 70° C

Operating temperature: 0° bis + 45°C

Rel. humidity: < 75 %

Inputs for the Stop/Strobe function

The Stop/Strobe function is use for the hardware control for the counters. If the stop input of an axis is active, the actual counter value will be frozen in to the output register. In the operation mode "automatic" the Stop/Strobe input is released after the input is inactive, thus the actual counter value can be read out by the software. In the operation mode "manual" the counter has to be released by a software command of the application.

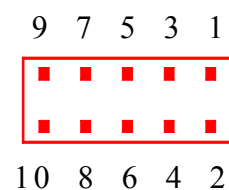
The following signals are available:

Stop_1/_2/_3: Potential free inputs for axis 1, axis 2 and axis 3 which are active if they are connected to GND

Stop + The input "Stopp +" has to be on a level of 5 V

Signal 0V: Case of the PC

PIN-No	Signal
1	Stop +
2	OV (GND)
3	-
4	OV (GND)
5	Stopp_1 (Axis 1)
6	OV (GND)
7	Stopp_2 (Axis 2)
8	OV (GND)
9	Stopp_3 (Axis 3)
10	OV (GND)



PIN-connection of the Stop/Strobe input

Specifications of the Signal Analyses:

- Counter width:** 32 Bit for each axis
- 4 Status bits (Reference, Error, Stop, Stop-level)
 - 20 Bit the values without interpolation (Signal period of the scale)
 - 8 Bits for the interpolation
- Signal analysis:** Subdivision/Interpolation by factor 256
- Strobe command:**
1. Via software by readout of the counters.
 2. Via Stop/Strobe signal at the stop inputs 1, 2 or 3
- REF - detection:**
1. Multiple, the counter is set to zero with each reference signal
 2. Single, the counter is set to zero only with the first reference signal
 3. No reference detection, the counter starts after power on of the counter card and the initialization of the drivers.