USER MANUAL v2.0

INCREMENTAL ENCODER PROGRAMMABLE SERIE PR90 / PR90H



USER MANUAL PR90 / PR90H









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Features



USB and graphical interface programming options for the PR90 programmable incremental optical encoder:

- ···· Incremental optical encoder, programmable for any possible number of pulses from 1 to 65.536 pulses per rotation.
- ··· Output Level selectable HTL (Push-Pull) / TTL (RS422) regardless of input voltage.
- ••• Reference signal width (Z) 90° or 180°
- ••• Reference signal positioning (Z) electrical vs. mechanical 0° to 360°
- Selectable rotation direction:
 CW (as seen from the axis, clockwise rotation)
 CCW (as seen from the axis, counter-clockwise rotation)
- ··· Independent channel by channel inversion option. Very useful in case of connection errors.
- Remote maintenance and programming options.



Direct USB2 to USB2 encoder connection to any computer or Tablet-PC running Windows, MAC OS or Linux, without the need for intermediate adapter boxes.

•• **Power-On programming** (encoder powered up)

Encoder can be programmed while it is powered up, with no need to disconnect it from the machine.



Power-Off programming (without powering up the encoder)

Ability to program the encoder without the need for it to be powered up, only by connecting the encoder to the PC programmer.









Auto sensing features

- Automatic voltage detection. The equipment determines the output level (HTL/TTL) according to input voltage. From 4.5Vdc to 10Vdc output will remain in TTL, from 11Vdc to 30Vdc output level will be maintained in HTL as long as the device is programmed for HTL output.
- Automatic overload detection in the encoder driver. In the event of a short circuit or overload in any of the outputs, the device will switch to TTL until the error is remedied. The encoder's LED with blink red and the graphic interface will display the relevant red indicator, registering the error, without interrupting the normal function of the device.
- Automatic Driver/PLC input impedance detection. When the encoder is programmed for HTL outputs, if a driver/PLC with TTL inputs (1200 x Channel) is connected, the encoder will switch outputs to TTL automatically.
- **Automatic humidity detection inside the encoder.** Water, humidity and condensation alarms. The encoder's LED with blink red and the graphic interface will display the relevant red indicator, registering the error, without interrupting the normal function of the device.
- **Optical error detection.** Any dysfunction in the OptoAsic illumination or breakage of any of the optical elements is automatically detected and is described by the graphical interface alarms, logging the error, without interrupting the normal operation of the encoder.









Protection

- Over voltage and power supply inversion protection. The encoder is protected to prevent its destruction in case of reverse polarity of power and/or spikes exceeding 35Vdc.
- Voltage drops. The device stops working below 3.9 Vdc. Up to this point the PR90 maintains the outputs at standard TTL levels, and if the voltage drop has been excessively slow the encoder goes into protection mode; to reset the rated voltage to recover its normal operation you must just turn it off and on again.
- ••• Electrostatic and/or electromagnetic discharges. Complies with the EMC directive (UNE-EN 61000-6-2:2006 + ERR:2009 and UNE-EN 61000-6-3:2007 + A1:2012). Although the equipment is protected to withstand electrostatic discharge above ± 15KVolt., occasionally the signal may lose a certain number of pulses during the discharge, at this point the equipment will reset the signal in under 100msec, the standard delay for a Watch-Dog circuit.
- ••• Active reset of the high-efficiency uController. This circuit resets uController operation in extreme cases of malfunction. For example, this situation can occur in unstable or high-noise power connections.
- False power connections. The encoder is protected to withstand being switched on and off repeatedly within the margins of usual operation, without the equipment being harmed.

It is not recommendable, like with any other electrical device, to turn the equipment on and off repeatedly in rapid succession while connected to mains power.

- •• The electronic circuit has **ultra-fast electronic fuses**; in the event of a fault or failure, these fuses avoid greater damage and more expensive repairs.
- ··· Electronics designed under the BSI security regulations, so as to avoid smoke and fire.
- ••• **4-layer printed circuit** designed under MIL standards, to offer greater mechanical robustness in order to avoid external radio-magnetic influences.





connect













For the PR90 programmable incremental optical encoder to work correctly, you must follow the detailed configuration instructions below:

Step 1: Connect the PR90 encoder to a USB port



You must open the connection cover located at the back of the PR90 encoder. The connection is direct, using a uUSB / USB cable to connect to any computer or tablet-PC, without any other equipment being required.



Step 2: Programming software installation





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decompress and run the installation program

Once the programming software has been downloaded, decompress the .zip file and run the installation program by clicking on the corresponding icon.

A Choose language and follow the instructions on screen:







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Cuando esté listo para continuar con la in	istalación, haga dic en Siguiente.	
INSTALL PROCESS		_
BEFORE TO INSTALL THE PR90 INTERFA	ICE PLEASE PETT CAREFULLY THE	
IF THE INSTALATION DON'T WORK, FIR	S IL JAVA JRE	
https://www.java.com/es/download/		
	Siguiente	

B Automatic alert about the installation process

Seleccione las Tareas Adicio	nales	
¿Qué tareas adicionales debe	n realizarse?	Ì
Seleccione las tareas adiciona PR90 y haga clic en Siguiente	les que desea que se realicen durante la i	nstalación de
Iconos adicionales:		
🔲 Crear un icono en el esc	Siguiente	

E Choose the additional tasks; create a desktop icon

	Destino	
¿Dónde debe instalarse PR	.90?	C.
El programa insta	lará PR90 en la siguiente car	peta.
Para continuar, haga dic e	n Siguiente. Si desea seleccio	onar una carpeta diferente.
haga dic en Examinar.		
C:\Program Files (x86)\PF	190	Examinar
	Sigui	ente 💊 🔜
		<u> </u>

C The program will install PR90 - HOHNER in the chosen folder

Listo para Instalar		
Ahora el programa está listo para inicia	r la instalación de PR90 en su	sistema.
Haga clic en Instalar para continuar co o cambiar alguna configuración.	n el proceso o haga dic en Ati	rás si desea revisar
Carpeta de Destino: C:\Program Files (x86)\PR90		*
Carpeta del Menú Inicio:	1	
PKSU		
	s Instalar	(
		7
		-
•	~	*

F The program is ready and configured for installing PR90 on your system



D The installation will create short cuts to the program in the chosen Start Menu folder



G Finish the installation and exit the installation wizard

www.encoderhohner.com +34 972 160 017 info@encoderhohner.com





Step 3: Run the programming software



Open the **"Communication Port"** A menu on the interface and choose the corresponding **communications port (COMX)**, B where the encoder is connected.

Once chosen, click on the button Connect *in the upper bar.* In approximately 2 seconds the programming interface will fill out with the programming and monitoring screens.







program

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A U T O M A T I C O S				PR90 / PR90H
Make sure, before you connect the encoder, that the configuration for the encoder is the correct type for your application.	uration required	Pay specia voltage out report read	I attention to the TTL / I put is not selected, the I errors.	HTL output configuration, since if the proper devices connected to the encoder could

When you connect the device, the computer will recognize the PR90 and you will hear the connecting devices sound and will see a flashing green led on the encoder \leftarrow for 1 second.





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Programming Screen

The configurable parameters are:







Step 4: Program the encoder

During Power-On programming (encoder powered-up), the PR90 should NEVER be programmed with the machine in operation.

At the time of programming information can be lost until programming has finished, and this could cause unexpected behaviour in the machine connected to the encoder.

4.1 ··· data record

Record configurable parameters selected to the encoder.

Write Encoder

Write configuration to encoder Write Encoder Read Encoder

Record the configuration to the encoder

Once these options have been selected, click on "Write Encoder" in the bottom task-bar of the programming screen. A message window appears, confirming that the recording process has finished correctly.





Verify the configuration to the encoder

We can verify that the data has been recorded correctly by clicking on "Read Encoder" in the bottom task-bar in the programming screen.

Default configuration

The encoder comes default preconfigured with:

- Pulses: 4096 ppr
- Output: HTL
- Direction: Clockwise (CW)
- Reference signal position (Z): 0°
- Reference signal width (Índex, Z, 0): 90°







configuration options

Also you can Save/Load the programming parameters to use them whenever you want without having to repeat the entire selection process. The saved settings are stored in a selectable list and may be loaded as detailed below:





Con	figuration na	ame.									<
Id	Name	PPR	Output Voltage Control	Direction	A inverted	B inverted	Z inverted	Z Pulse Position	Z Pulse Width		
1		4096	HTL	CW	False	False	False	0.000	90°	Delete	
2	Program1	1024	TTL.	ccw	True	True	True	90.00*	1601	Delete	
3	Program2	65500	HTL	cw	False	False	False	180.00°	90°	Delete	
-						1.0					-



Export/Import configuration

- Export encoder configuration in external text document
- Export all saved configurations in external text documents
- Import encoder configuration previously exported





Monitoring Screen

	Configuration Monitoring	ation				
Current A	Pulses per revolution	Direction	Switch Output Polarity (when required)	Voltage	Z Pulse	
configuration	PPR 4096 Clockwise Switch A to nA, nA to A Output © Counter Clockwise © Switch Z to nZ, nZ to Z Output	Output HTL	Position 0.000	00		
		Switch Z to nZ, nZ to Z		Width 90°	0	





The PR90 encoder can be monitored with frequencies below 30 KHz (30.000 PPS).





Step 5: Close encoder and labeling



Once you have configured the encoder, you must close the programming software and disconnect the uUSB/USB cable. Then close the protective cover.



It is imperative to close the connection cover again to ensure IP65 protection.



5.2 ... **labeling** It is recommended that you write the programming data on the encoder's "SETTINGS" label.





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Troubleshooting

	Problem	Cause	Solution
	The PR90/PR90H does not communicate with the PC	Computer needs the installation of USB Drivers	Connect the computer to internet to install USB drivers automatically. Older versions of Windows could need a manual installation of USB drivers. Available at http://www.encoderhohner.com/pr90
		Your computer belongs to a Windows Domain	The Domain Administrator must give to computer user administration rights.
	The communications port is not listed in the programming	Unstable cable connection	Reconnect the cable until your OS recognizes it and restard the interface.
	interface	Operating System Collapse	Restart the OS and the PR90 interface.
		uUSB-USB cable is broken	Replace the cable.
PR60	Error "Could not write to port"	Fail connection between the programming software and the encoder	 Close the programming software Disconnect the uUSB/USB cable, and connect it again. Run the programming software and connect it with the encoder.
PR00	PLC/driver error message	Wrong selection of output type (TTL - HTL) in PR90 programmation interface	Review and choose the rigth programmed output type.

1 During Power-Off programming the encoder can show a flashing red led. It doesn't mean a wrong connection or programming error.

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Considerations

Power Supply

This incremental encoder allows you to work at any voltage from 5 to 30Vdc without the need for any change or adjustment. However, you should pay attention to the polarity of the Vdc connection.

It is recommended in all instances to use a power supply that support loads in excess of 2 Amp., to ensure a very low power impedance and therefore better signal quality.

Connectivity 1

Each differential output channel is identified by the colour of the wires, which plug directly into the differential PLC or Driver inputs. In order to preserve the quality of the signal, this equipment must be mounted on differential resistive loads.

In case of confusion in the connection, this can be corrected without need for disconnection, through the graphical programming interface.

Differentiated earth line

The equipment is absolutely shielded against external influences, electromagnetic fields and discharges. Even so, it is advisable to establish a differentiated earthing circuit. Branched earthing distribution.





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