



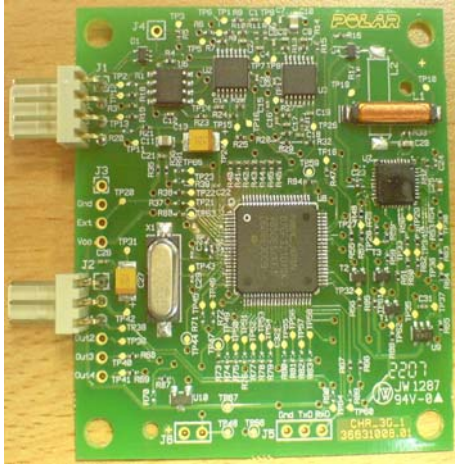
Adding Heart to Your Technology

V 1.6 18 Jul 2007

G3CHR

Contact heart rate measurement system

Model with wireless receiver and connectors
(#94032295)



APPLICATIONS:

- Commercial exercise equipment

FEATURES

- Contact heart rate measurement
 - 8s typical detection time
- Optional built in wireless receiver
- ESD protected

DESCRIPTION

G3CHR is a family of Polar contact heart rate products. The basic operation of the system is to detect the heart rate of a user either from the hands or from the transmitter belt the user wears while exercising. The system calculates the heart rate average and outputs it as digital pulses. The exercise equipment software calculates the time between the pulses and converts it to heart rate value.

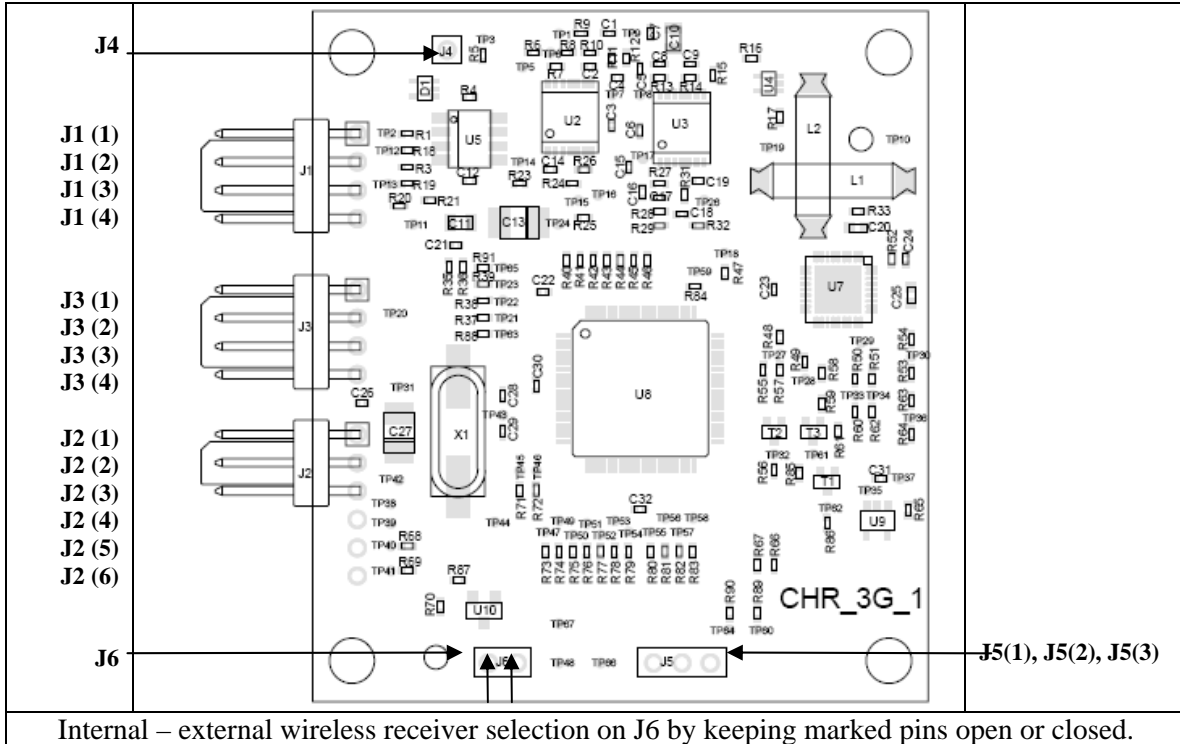
This contact heart rate system operates at 5Vdc voltage. Wireless receiver system is optimized on coded signals giving the full benefit on gym environment. System is also capable to keep shortened range while it's looking for a wireless signal. After signal is found, the range is released to normal reception distance. This will help out on environments where several machines are close to each other.

The available options are listed on the last page of this datasheet. Please contact your local sales representative to discuss your requirements. Contact information is found on the footer of each page.

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PIN CONFIGURATION



Detailed pin description can be found on the next page.



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PIN DESCRIPTION

Pin name	Function
J1 (1)	Reference electrode
J1 (2)	Vin + electrode
J1 (3)	Vin - electrode
J1 (4)	Reference electrode
J2 (1)	Ground
J2 (2)	Vcc
J2 (3)	Output 1, Combined output or hand measurement output.
J2 (4)	Output 2, Hands on / off level indicator.
J2 (5)	Output 3, Source status. Used on combined outputs setting.
J2 (6)	Output 4, Separate wireless output.
J3 (1)	Not connected
J3 (2)	External wireless receiver ground
J3 (3) *	External wireless receiver output
J3 (4)	External wireless receiver Vcc
J4	ESD protection to chassis connector
J5 (1)	Serial data ground
J5 (2)	Serial data TX (Serial data out)
J5 (3)	Serial data RX (Serial data in)
J6 open	Internal wireless receiver in use
J6 closed	External wireless receiver in use (receiver to be connected on port J3)

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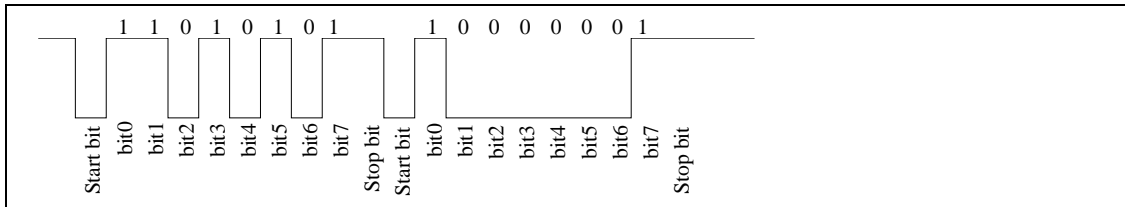


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SERIAL DATA

Data format is as shown below:



It will only be available on the connector reserved for it if serial communication is selected. Also it will always act as combined output. This means that data sent from serial line depends of the priority settings on the same manner that with combined pulsed output.

Serial communication line is asynchronous 5V TTL logic. Communication speed 1200bps. Communication format is one start bit, eight data bits and one stop bit. Two bytes send, first one is heart rate and second is status. The order of bits in both bytes is standard to UART, the first bit after the start bit is LSB.

Each transmission includes two bytes; heart rate value and status information. Heart rate value is transmitted first with the LSB first. Bits 0 and 1 of the second byte are used for indicating the current status of the heart rate measurement. Please see the following table.

Bit 0	Bit 1	Status
0	0	Every heart rate value is reliable
0	1	Undefined
1	0	The system is searching for a new reliable heart rate value
1	1	Undefined

Bits 2-6 are not used. Heart rate source information is available from bit 7 as follows:

Bit 7	Heart rate source
0	Hand sensors
1	Wireless receiver

Hands on information is sent on serial transmission so that both bytes, heart rate and status, are containing 0. Hands off information is sent on the same sense, except both bytes are containing 1.

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ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Supply voltage	V _{cc}	4.75	5.25	V
Storage temperature	T _s	-10	+50	°C
Operating temperature	T _o	+5	+50	°C

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply voltage	V _{cc}	T=25°C		5.0		V
Supply current average	I _{avg}	T=25°C V _{cc} =5.0V		40		mA
Storage temperature	T _s			+25		°C
Operating temperature	T _o			+25		°C
Detection time from hands	Δt	T=25°C V _{cc} =5.0V		8		s
Wireless reception range (typical)*	l	T=25°C V _{cc} =5.0V	80		105	cm

*) Can be changed on request

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ELECTRICAL CHARACTERISTICS BY PIN

Pin name	Function
J1 (1)	Reference electrode connection. Left hand fingertips.
J1 (2)	Vin + electrode connection. Left hand palm.
J1 (3)	Vin – electrode connection. Right hand palm.
J1 (4)	Reference electrode connection. Right hand fingertips.
J2 (1)	Ground
J2 (2)	Vcc
J2 (3)	Output 1, Combined output or hand measurement output.
J2 (4) *)	Output 2, Hands on / off level indicator.
J2 (5) **)	Output 3, Source status. Used on combined outputs setting.
J2 (6)	Output 4, Separate wireless output.
J3 (1)	Not connected
J3 (2)	External wireless receiver ground. Connect wireless receiver ground here.
J3 (3) *	External wireless receiver output. Connect wireless receiver output here.
J3 (4)	External wireless receiver Vcc. Connect wireless receiver Vin here.
J4	ESD protection to chassis connector
J5 (1)	Serial data ground
J5 (2)	Serial data TX (Serial data out)
J5 (3)	Serial data RX (Serial data in)
J6 open	Internal wireless receiver in use
J6 closed	External wireless receiver in use (receiver to be connected on port J3)

*) Level is “0” when hands are not connected and “1” when hands are connected.

**) Combined mode: If on “0”, output source is wireless and if “1”, output source is hand measurement.

**) Separate outputs: “0” means wireless signal is coded and “1” means wireless signal is noncoded.

BOARD DIMENSIONS

Dimension	Value
Length	55 mm
Width	62 mm
Height *)	12 mm
Connector spacing	2.54 mm

*) With programming connector J6

NOTE: Connectors excluded

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ORDERING INFORMATION

Currently available versions from stock and list of functions on standard models

Board number	Board name
94032295	G3CHR

		94032295
Wireless receiver included		X
Wireless receiver not included		
Wireless optimized for non coded		
Wireless optimized for coded		X
Reduced range on code search		X
Normal range on code search		
Receiving coil assembly L1		X
Receiving coil assembly L2		
Combined output		X
Separate output (Wireless on Output4)		
Pulse output		X
Serial output 1200bps		
Positive output pulse		X
Negative output pulse		
Output pulse width 10ms		
Output pulse width 20ms		X
Outputting buffer 4s enabled		
Outputting buffer 4s disabled		X
Hands on / off pulse		X
Hands on / off level indicator (Output2)		
Output 3 wireless / hand source information		X
Output 3 coded / noncoded source information		
Internal wireless receiver used		X
External wireless receiver enabled		
Wireless prioritized		
Hand measurement prioritized		X
J1 254W-1-04-G		X
J2 254W-1-04-G		X
J3 254W-1-04-G		X
J4 Not assembled		X
J5 Not assembled		X
J6 pinheader		X

Alternate configurations are available upon request

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