CAMMEGH

The World's Finest Roulette Wheel

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GB

M360 Series

Owners Handbook

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CAMMEGH Roulette Wheels – Mercury 360 (M360) Series

Mercury 360

Starlight 360

M360 RRS

The manufacturer reserves the right to modify, without prior notice, the technical specifications in order to accommodate the latest technical developments. CAMMEGH LTD. will provide information on the status of existing operating instructions and on any alterations and extensions that may be relevant.

About this handbook

This handbook has been developed for use with the models listed on the previous page only.

All Cammegh Roulette Wheels have been precision engineered to the finest tolerances for consistent non-biased operation in the gaming environment.

Before performing any maintenance or calibration work, if in doubt, consult this handbook and appropriate wheel service booklet before attempting work.

Should you require further assistance, please contact us as detailed in the support section of this book.

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Symbols Used

⚠ This symbol indicates important information and should be read, understood and observed by all operational and maintenance personnel.

 This symbol indicates important information specifically aimed at maintenance personnel, and actions that should only be attempted by fully trained personnel.

 This symbol indicates inspection and maintenance is recommended.

i This symbol indicates further useful information is available.

Safety

⚠ It is recommended that all maintenance personnel read and understand this booklet before attempting work.

⚠ This roulette wheel exceeds 45kg+. Do not attempt to lift this wheel without assistance, using correct manual handling techniques.

⚠ Do not drop any of the wheel components from any height or impact excessive force upon any of the roulette wheel surfaces.

⚠ Do not use any chemicals, aggressive substances or solvents on any of the roulette wheel surfaces.

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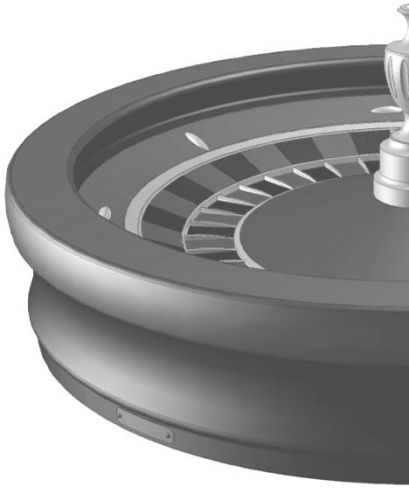
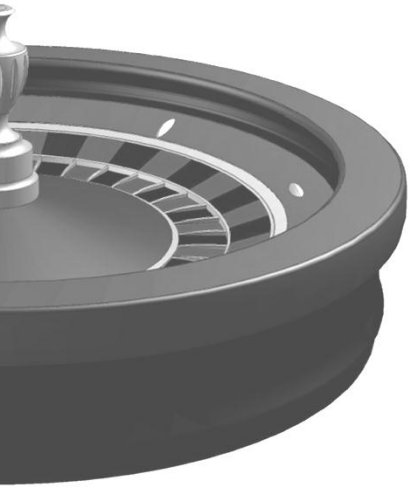
1

The World's Finest Roulette Wheel



M360 Series Overview



Setup

Recommended Maintenance

Troubleshooting

CAMMEGH Customer Support

About this Section

This section explains the main features of this Cammegh M360 Series roulette wheel.

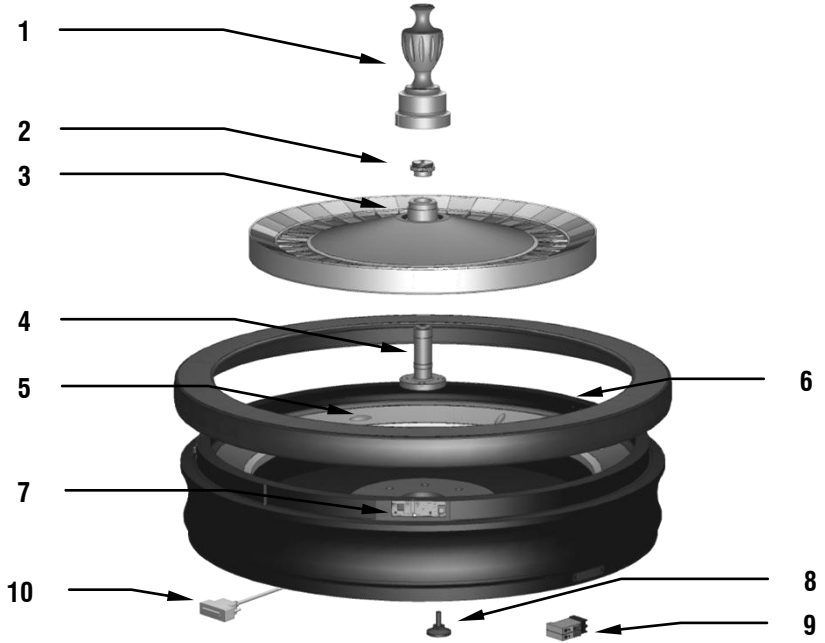
Whilst all roulette wheels maybe similar, it is advised that the basic features and operations of the Cammegh M360 series wheels are understood by all operational personnel.

Diagrams are for illustration purposes only and actual wheel supplied may vary dependant on model and configuration.

⚠ Do not attempt to disassemble roulette wheel unless trained or advised by Cammegh Engineers.

Contents

CAMMEGH M360 Series Roulette Wheel



Descriptions

1 Turret

2 Height Adjuster

3 Rotor and Separator Ring*

4 Maintenance-Free Bearing

5 Wheel Bowl & Ball Stops*

6 Garnite™ Race track

7 In-Rim sensors

8 Level Adjustable Feet

9 Rotor + Level Sensor board

10 Controller Connectivity

* Starlight model features acrylic rotor, light ring and diffuser plate assembly.

Turret

The Cammegh signature turret crowns every Cammegh roulette wheel and identifies Cammegh's finest wheels on the gaming floor.
(Custom Turrets available upon request)

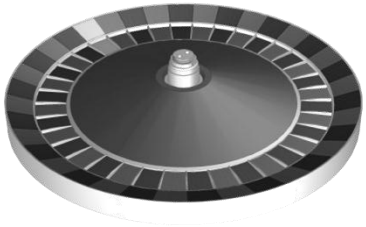
The turret screws on to cover the height adjuster of the roulette wheel rotor.

⚠ **NEVER** force the turret onto the rotor thread, or at an angle.

⚠ Do not over-tighten or apply excessive force to the turret.

Turret Fitting – 18 **i**

Rotor and Height Adjuster



The precision machined rotor, separator ring and cone construction ensures bias free gaming utilising tolerances to 0.01mm.

The rotor houses the height adjuster piece at the centre shaft for quick, simple and yet precise rotor height adjustment.

⚠ Rotor weight 15 kg+

⚠ Rotor and Wheel are factory set and matched. Do not mix components between different serial numbers.

Height Checking – 34 **i**

Maintenance – Free Bearing

The Cammegh maintenance-free for life bearing assembly provides the back bone for flawless precision rotation.

Using our specialist bearings and the finest engineering tolerances, the rotor performance is enhanced over time for premium rotational operation.

⚠ **NEVER** lubricate or attempt overhaul work on the bearing assembly.

In-Rim Sensors

Cammegh In-rim sensor technology provides precision ball tracking throughout the game and winning number output.

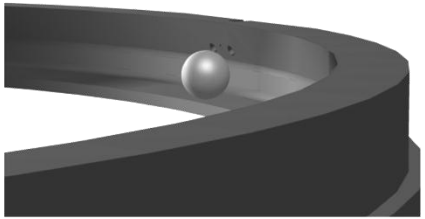
In-Rim sensors are factory calibrated ready for use with ivorine & teflon standard colour balls, of 18 & 21mm diameters.

⚠ Do not operate roulette wheel without top rim in place.

Seek advice before attempting re-calibration or investigating suspected In-Rim sensor failure.

Sensor Troubleshooting – 44 i

Garnite ™ Race track



The Cammegh Garnite™ race track is precision machined to every bowl and features excellent hardwearing and low resistance properties for continuous uniform ball play.

The race track discreetly houses 2,3 or 4 sets of in-rim sensor lenses for ball detection.

⚠ Keep the race track contamination free and clean.

Ball Speed Troubleshooting – 30 i

Wheel Bowl & Ball Stops

Every Cammegh wheel bowl is finished to the highest degree of accuracy and quality for unbiased game play.

Ball stops are evenly configured and secured at the bowl surface for enhanced ball action.

⚠ Do not attempt to remove or adjust ball stops. If damaged, contact Cammegh for refurbishment and overhaul servicing.

Contact Cammegh – 49 i

Rotor + Level Sensor

Integrated to the bearing plate is the rotor and level detection board for constant monitoring of rotor velocity and wheel level.

The level can be observed with the X and Y axis indication LED's of the BOB.

⚠ Take care not to damage the rotor barcode or optical sensor heads.

Seek advice before recalibrating sensors.

Connectivity

The 15 pin serial cable transfers collated data from all wheel sensors to the Cammegh BOB for game protocol output and interfacing.

⚠ Do not exert excessive force on serial cable or connector.

Cammegh BOB connections – 20 i

Cammegh BOB

All M360 Series wheels use Cammegh's BOB or Break Out Box for output protocol comms, via ethernet and 3 serial ports.

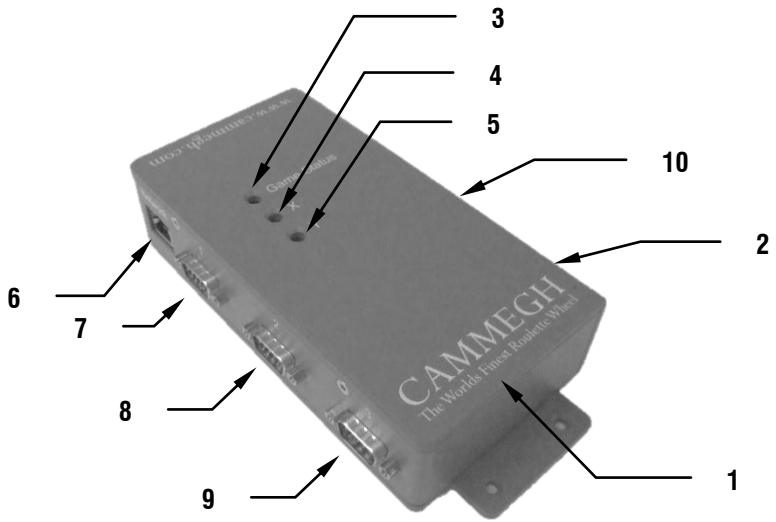
The BOB output protocol is compatible with external devices such as Cammegh's Billboard™ & PitBoss™ devices, or gaming servers or terminals.

⚠ Do not open the BOB and/or disassemble components.

Seek further advice on protocol output before connecting to external programs or devices.

Accessing Game Protocols – 38 i

CAMMEGH Break Out Box (BOB)



Descriptions

1 Cammegh BOB

2 Power Supply Connection*

3 Game Status LED

4 X axis Level Status

5 Y axis Level Status

6 Ethernet Port

7 9 pin D Series Port 1 (in+out)

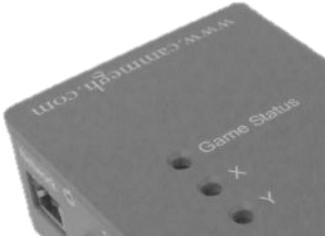
8 9 pin D Series Port 2 (output)

9 9 pin D Series Port 3 (output)

10 15 pin D Series Port (wheel)

* **Only use the power supply supplied by Cammegh. Failure to do so may result in damage to the BOB.**

Game Status LED



The LED indicates the current game state by illuminating different colours.

GREEN indicates the wheel is ready for a new game.

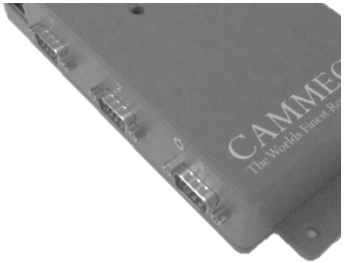
RED indicates the game is in a No More Bets state.

AMBER indicates a winning number has been determined.

⚠ Mount the BOB so the LED is easily viewable.

BOB Troubleshooting – 31 i

Serial Connectivity



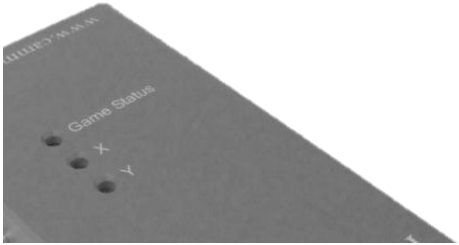
Serial ports enable connection of the wheel to the controller (15 pin serial connection), and external devices such as the Cammegh Billboard™ and Cammegh PitBoss™ products (9 pin serial connections)

Computers for diagnostics or gaming interaction can be connected via **serial port 1** offering input and output connectivity.

⚠ Seek advice before accessing game protocols.

Accessing Game Protocols – 38 i

Level Analysis



X and Y axis level status can be observed using feedback from the bearing plate mounted level sensor.

The level of the bearing plate (parallel to the ball track) is monitored to an accuracy of 0.1 degrees for continuous monitoring.

The indication LED's can assist in accurate levelling of the wheel in the X and Y axis

Levelling the wheel – 26 i

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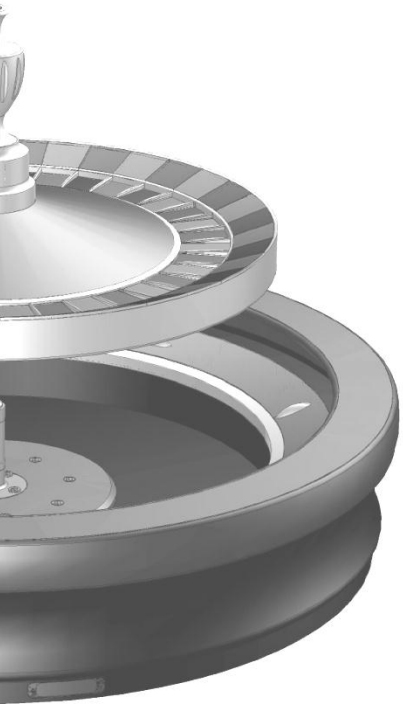


About this Section

This section explains how to setup the Cammegh wheel and controller.

Dependant on table construction, it maybe required that a 62mm hole is cut in the table wheel position surface to enable the communications cables to be passed under through the table top. This is advised where Cammegh Billboard™ equipment is mounted under the table surface.

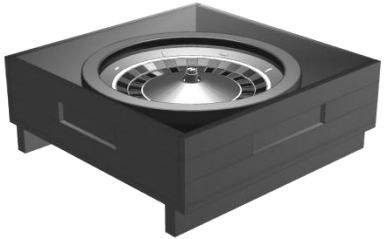
Whilst all roulette wheels maybe similar, it is advised that the basic features and operations of the Cammegh M360 series wheels are understood by all operational personnel.

Diagrams shown for indication only and may differ according to product model.

⚠ Do not attempt to disassemble roulette wheel unless trained or advised by Cammegh Engineers.

Contents

Wheel Unpacking



Instructions for safe wheel unpacking can be found in the setup and handling guide leaflet on the lid of the packing crate.

It is strongly recommended this guide is read before removing the wheel from the packing crate.

⚠ Adhere to the guidelines issued in the setup and handling guide to avoid damage to the wheel and components.

Lifting the Wheel

Lift the wheel with at least two persons, from the base of the wheel bowl.

Do not lift the bowl using any other part of the wheel, i.e. do not lift by holding the top rim or rotor.

⚠ **Wheel Weight 45kg+**

⚠ Follow manual handling guidelines at all times.

Fitting the Turret

Locate the turret above the centre spindle of the rotor and carefully wind the turret clockwise, on to the spindle, holding the rotor steady.

To remove, hold the rotor steady and turn the turret anti-clockwise.

⚠ **NEVER** force the turret on to the rotor.

Levelling the Wheel

The wheel features three height adjustable feet for accurate setting of the wheel level.

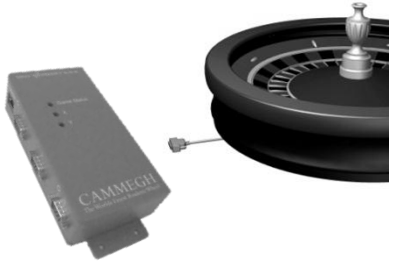
The wheel level can be set using a digital level / protractor on the bearing plate, or buy using the integrated level sensor which is factory calibrated to 0.0 degrees.

The wheel should be level in all planes to < 0.1°.

⚠ Ensure the level is accurately calibrated before setting the wheel.

Levelling the wheel – 26 i

Connecting the BOB



Plug in the 15 pin D serial plug from the roulette wheel underside, into the 15 pin serial socket of the BOB, marked 'Wheel'

Secure the plug turning the two screws clockwise into the socket mountings

⚠ Do not mount the controller unit near any heat sources or in direct sunlight or near any liquids.

⚠ **Connect the BOB to the wheel before connecting the PSU.**

BOB connections – 20 i

Connecting PSU

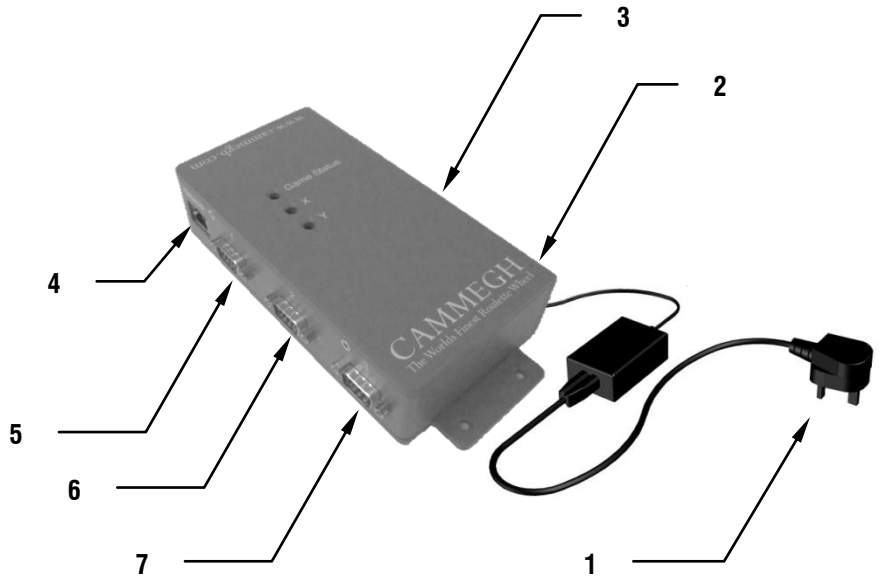
Plug the jack end of the power supply unit (PSU) into the power input of the BOB and secure using the retaining screw.

Plug mains supply lead into the mains power supply.

⚠ Use a stable and tested mains power supply.

BOB Connections – 20 i

CAMMEGH BOB Setup



Connections

1 PSU to Mains Electric

2 BOB to PSU

3 Wheel to BOB

4 Ethernet Output

5 Serial Input/Output to device

6 Serial Output to device

7 Serial Output to device

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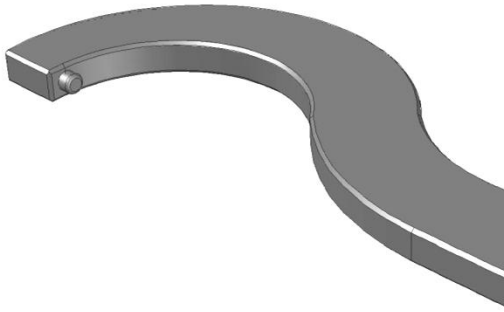
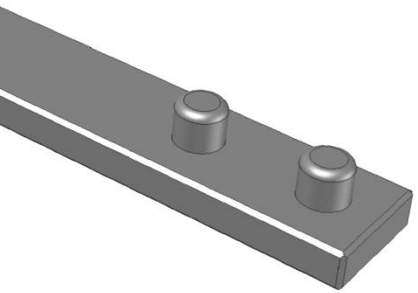
The World's Finest Roulette Wheel





About this Section

This section explains the recommended maintenance requirements of this Cammegh wheel.

Whilst Cammegh have designed all roulette wheels for minimal maintenance, it is still recommended that the aspects detailed in this section are undertaken to maintain high performance gaming.

Maintenance should only be attempted by trained personnel and reference should be made to this handbook.

Diagrams shown for indication only and may differ according to product model

⚠ Do not disassemble wheel unnecessarily or leave wheel in disassembled state with bearing unprotected or sealed.

Contents

Cleaning Surfaces

The gaming surfaces of the roulette wheel must be kept clean and contaminant free.

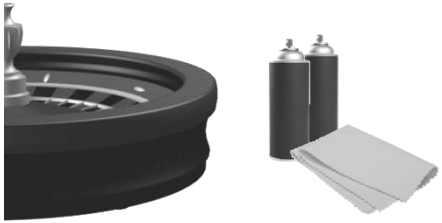
Use a soft lint-free or micro-fibre cloth to wipe over all wheel surfaces, and a vacuum with soft attachment to clean the rotor pockets.

Only use cleaning products as recommended by Cammegh.

⚠ Never use or expose the wheel surfaces to aggressive or invasive chemicals, solvents or thinners.

⚠ If in doubt, test a small area first.

Recommended Cleaning



Race track and playing surfaces:-

- Furniture Polish
- Methylated Sprits (stain remove only)
- Alcohol/isopropanol wipes

For metal polishing:-

- Lightweight polish only.
- Brassol
- Autosol

⚠ Do not use aggressive chemicals on wheel surfaces.

Cammegh Servicing

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Cammegh's expert engineers are available to support your servicing requirements.

When servicing your Cammegh roulette wheels, our experts will fully assess the roulette wheel condition and test the wheel and associated protocols for correct operation, giving you peace of mind.

A full service report will be issued for each wheel which details specific findings and/or further recommendations.

Contact Cammegh – 49 i

Weekly Checks

Cammegh recommend that on a weekly basis, the following is checked, for hassle-free performance gaming.

- Check wheel is level.
- Clean wheel gaming surfaces.
- Check winning number output is correct (if used with Cammegh Billboard™, PitBoss™, or external gaming devices).

Sensor Troubleshooting – 31 i

2 Month Checks

Cammegh recommend that on a 2 monthly basis, the following is checked, for hassle-free performance gaming.

- Inspect all wheel gaming surfaces for damage.
- Check rotor height.
- Inspect integrity of connections at BOB.

Rotor Height Checking – 34 i

BOB Connections – 20 i

Annual Checks

Cammegh recommend that on an annual basis, the following is checked, for hassle-free performance gaming.

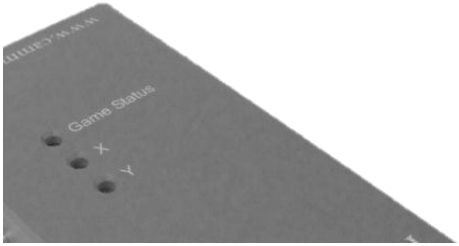
- Remove rotor & inspect for damage.
- Inspect rotor barcode.
- Inspect rotor sensors.
- Inspect bearing for security.

Rotor Removal – 41 i

Rotor Barcode – 42 i

Rotor Sensors – 43 i

Levelling the Wheel



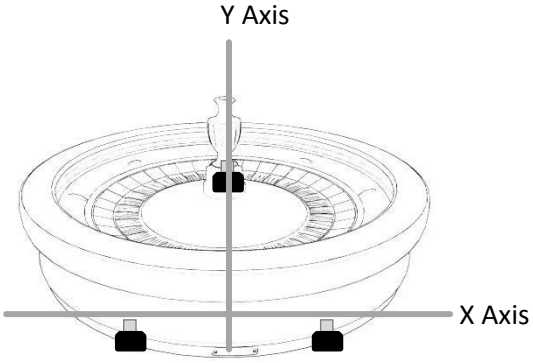
The X and Y level status LED's of the BOB can be used to level the wheel

X axis – LED solid illumination
The wheel is not level in the X axis with a positive incline.

X axis – LED flashing illumination
The wheel is not level in the X axis with a negative incline

Y axis – LED solid illumination
The wheel is not level in the Y axis with a positive incline.

Y axis – LED flashing illumination
The wheel is not level in the X axis with a negative incline



Adjust the feet of the X axis so the wheel is level in the X axis.

Once level has been obtained in the X axis, adjust the single foot on the Y axis so the wheel is level in the Y axis.

The X and Y status LED will not illuminate when the wheel is level.

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The World's Finest Roulette Wheel

About this Section

This section explains how to diagnose/troubleshoot and recalibrate this Cammegh wheel.

Whilst all roulette wheels may seem similar, it is advised that the basic features and operations of the Cammegh M360 Series wheels are understood by all operational personnel.

Diagrams shown for indication only and may differ according to product model.

⚠ It is strongly advised that all troubleshooting operations are performed by trained maintenance personnel only.

⚠ If in doubt, refer to this manual or contact Cammegh Customer Support before investigating operation faults.

⚠ Understand procedures before attempting re-calibration.

Contents

Rotor Performance Issues

A loss in rotor performance can normally be attributed to contamination of the rotor surfaces or contamination of the rotor bearing.

Remove the rotor and check the radial surfaces are clean and clear of contamination or debris.

⚠ **NEVER** service or lubricate the bearing assembly.

Rotor Removal – 41 **i**

Ball Speed Issues

A loss of ball speed can normally be attributed to contamination of the race track surface, or the ball itself.

Clean the race track using cleaning products as specified in the maintenance section of this handbook, and clean or replace the ball with new.

⚠ Take care not to scratch or damage in-rim sensor lenses when cleaning race track.

Recommended Cleaners – 24 **i**

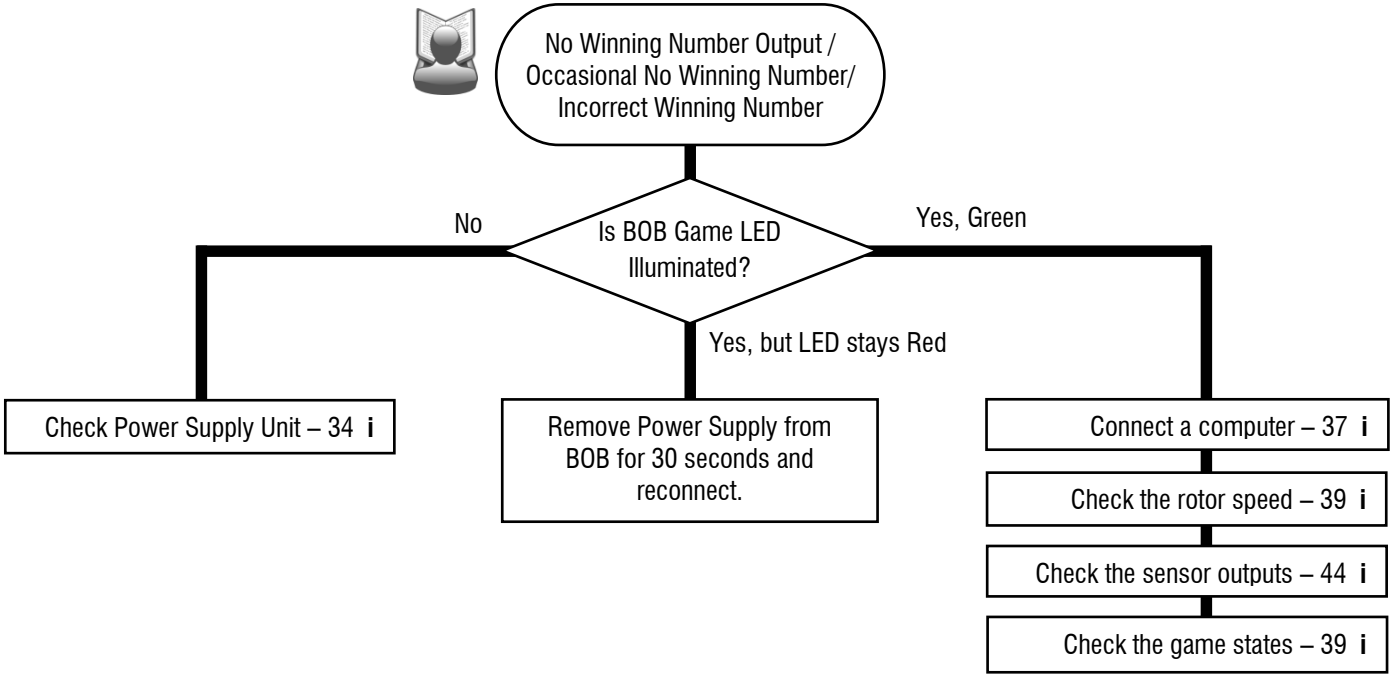
Winning Number Output

Game play troubleshooting is covered in the following pages using flow charts.

These troubleshooting flow charts assist:

- Winning Number is not output.
  Winning No. Troubleshooting – 31 **i**
- Loss of communications from BOB
  BOB Troubleshooting – 32 **i**

Winning Number Troubleshooting



No More Bets Troubleshooting

The game protocol is stuck at the No More Bets game state

Has the ball been at rest in the pocket for > 10 seconds?

No

The ball must be detected correctly by all three In-Rim Sensors.

At slow rotor speeds, it may take some time for the ball to travel across all three sensors.

Recommended min. rotor speed = 10 RPM

Yes

Re-spin the game and check No More Bets game state.

Remove Power Supply from BOB for 30 seconds and reconnect.

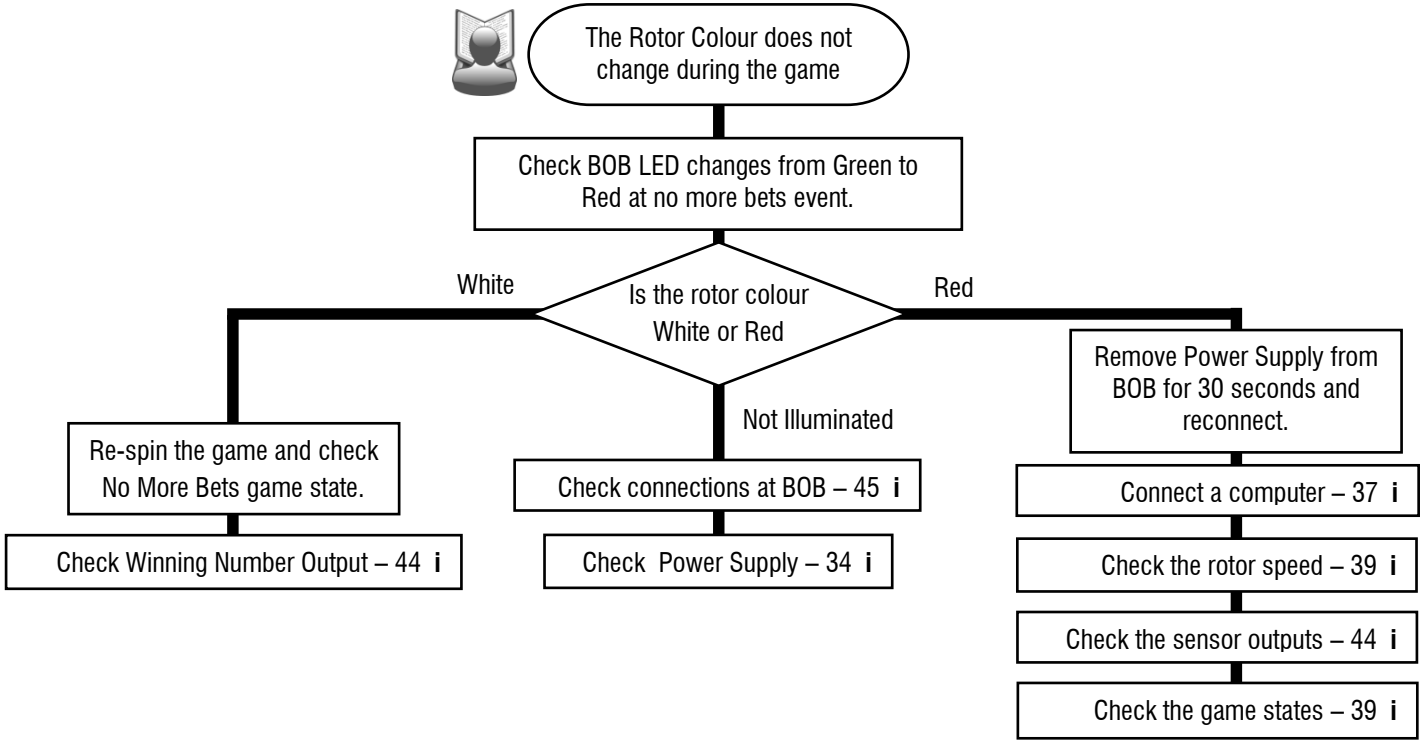
Connect a computer – 37 **i**

Check the rotor speed – 39 **i**

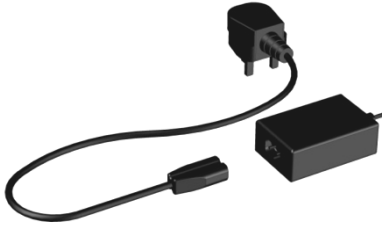
Check the sensor outputs – 44 **i**

Check the game states – 39 **i**

Rotor Colour (Starlight only)



Power Supply Unit



The BOB power supply unit comprises of the main power unit and interchangeable mains flex.

Check the two components are fully fitted together.

⚠ Disconnect the power supply unit from the mains before investigating any suspected faults.

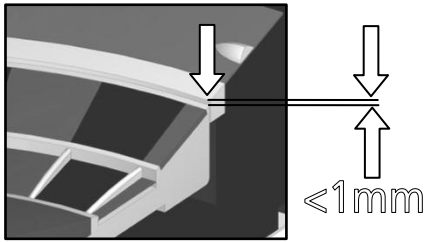
If the BOB controller Game LED is not illuminated, check the following:

- Check all connections are made.
- Check fuse in mains plug.
- Check mains electric supply.

⚠ Contact Cammegh for replacement power supply unit.

⚠ Contact Cammegh for replacement BOB Break Out Box.

Checking Rotor Height



The rotor should always be set level with, or **<1.0mm** below the bowl ring level.

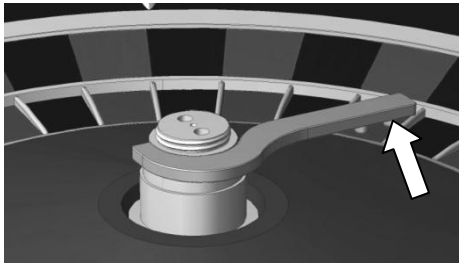
If the rotor is set higher than the wheel bowl and ring, the ball may hang on the rotor edge.

⚠ **NEVER** run the rotor against the base bearing plate.

Contact Cammegh – 49 **i**

Rotor Height Adjustment

Remove the turret by turning it anti-clockwise whilst holding the rotor to access the height adjuster and locking ring.

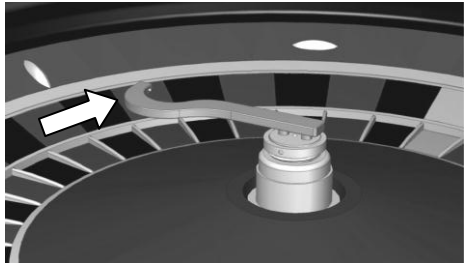


Release the locking ring by using the tool as shown in the diagram, locating the pin of the tool in the hole of the locking ring.

Turning the locking ring and tool **anticlockwise** to **release**.

⚠ Only use the Cammegh supplied Height Adjustment Tool.

Raise Rotor Height

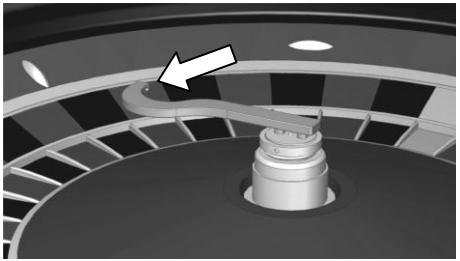


Place the studs of the tool in the sockets of the height adjuster.

Turn the height adjuster **clockwise** to **raise** the rotor height.

Check gaming function. Rotor height adjustment may require recalibration of rotor sensors.

Lower Rotor Height



Place the studs of the tool in the sockets of the height adjuster.

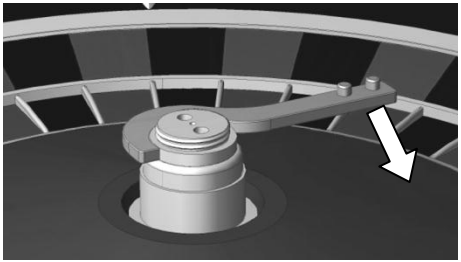
Turn the height adjuster and tool **anti-clockwise** to **lower** the rotor.

Do not remove the height adjuster from the rotor whilst mounted in the wheel.

⚠ Only use the Cammegh supplied Height Adjustment Tool.

Check gaming function. Rotor height adjustment may require recalibration of rotor sensors.

Rotor Height Adjustment



Secure the locking ring by using the tool as shown in the diagram, locating the pin of the tool in the hole of the locking ring.

Turning the locking ring and tool **clockwise** to **secure**.

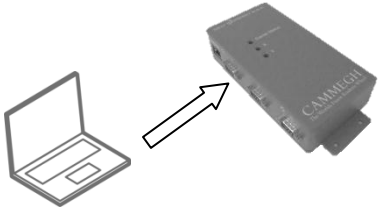
⚠ Do not over tighten the locking ring.

⚠ Ensure the locking ring is secured before replacing turret.

Replace the turret by placing it over the height adjuster and turning it clockwise whilst holding the rotor.

Ensure the turret is secured.

Connecting a Computer

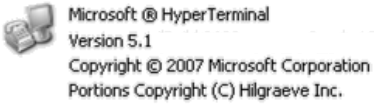


For a majority of fault finding issues, the output protocol from the Cammegh BOB provides diagnostic information regarding the condition of the wheel and the ball detection sensors.

A serial communications program such as MS Hyperterminal, RealTerm or putty can be used for protocol viewing and command based configuration and diagnostics.

Connect to serial port 1 of the BOB for input/output connectivity. Serial port 2 is output only.

Using MS Hyperterminal



Launch Microsoft Hyper Terminal application on the computer.

When typing commands, the typed text will NOT be displayed.

Please consult the Microsoft Help guide for the correct use of MS Hyper Terminal application, before using this program.

Connection Settings

Use the settings as shown above to configure the connection to the BOB to view the Cammegh gaming protocol.

Bits per second – 9600
Data Bits – 8
Parity – None
Stop Bits – 1
Flow Control – None

Advanced Protocol

*m0 0 0

*X;3;010;22;0;219;1;
*X;4;010;22;0;217;1;
*X;4;010;22;0;215;1;
35
*X;5;010;35;0;214;1;

The advanced protocol is the default output protocol level, showing game state, game number, winning number, warning error flags, rotor speed and direction.

The basic protocol is accessed by the command:-
***m 0 0 0 <enter>**
Asterisk small 'm' zero space zero space zero enter key

More information on reading the default (advanced) protocol output can be seen on the following page.

Basic Protocol

* m1 1 1

*S
*N
*W21

The basic protocol outputs a reduced protocol level, showing game start, no more bets event, winning number and confirmation only.

The basic protocol is accessed by the command:-
***m1 11 <enter>**
Asterisk small 'm 'one space one space one enter key

Extended Protocol

*m2 2 2

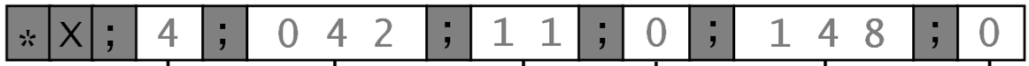
*X;3;010;22;0;219;1;0022;08;0;0B099;??
*X;4;010;22;0;217;1;0022;08;0;0BC29;??
*X;4;010;22;0;215;1;0022;08;0;0C9A2;??
35
*X;5;010;35;0;214;1;0122;00;0;162B4;35

The extended protocol outputs the same protocol of the Advanced Protocol with ball detection information.

This includes the number of ball revolutions, direction of ball revolution, and the pocket position of the ball in the rotor.

The extended protocol is accessed by the command:-
***m 2 2 2 <enter>**
Asterisk small 'm' two space two space two enter key

Cammegh Advanced Gaming Protocol (Default Setting)



No More Bets Status

Indicates current Game Status.
Numerical Value 1 - 7

Value	Description
1	Start Game
2	Place Bets
3	Ball in Rim
4	No More Bets
5	Winning Number
6	Table Closed
7	Dealer Lock

Current Game No. 42

Indicates current Game Number. (looping)
Numerical Value 1 - 255

Value	Description
1	Game 1
2	Game 2
254	Game 254
255	Game 255
1	Loop to Game 1

Last Win No. 11

Indicates last game Winning Number.
Numerical Value 0 - 36

Value	Description
0	Win Number 0
1	Win Number 1
2	Win Number 2
35	Win Number 35
36	Win Number 36

Current Game OK

Indicates current game Warning Flag.
Hexadecimal Value

Value	Description
0	Game OK
1	Rotor Speed <10.0 RPM
2	Ball Launch in same direction as Rotor.
4	Rim Sensor Error
8	Void Game or Low Ball Spin Speed.

Rotor Speed 14.8 RPM

Indicates current game Rotor Speed RPM.
Numerical Value 010 – 540

Value	Description
010	Rotor 1.0 RPM
011	Rotor 1.1 RPM
539	Rotor 53.9 RPM
540	Rotor 54.0 RPM

Rotor Spin Clockwise

Indicates current game Rotor Direction.
Numerical Value 0 - 1

Value	Description
0	Clockwise
1	Anti-Clockwise

Game States / Status

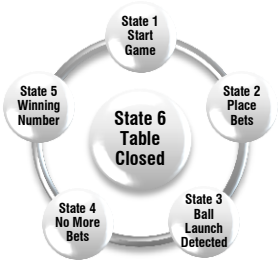
*X;1; - Game start
*X;2; - Rotor Rotating
*X;3; - Ball in Track
*X;4; - No More Bets
*X;5; - Win Number

The game status digit of the Cammegh advanced protocol indicates the live game status of the wheel.

The normal game sequence operates between states 1 to 5.

State 1 indicates the rotor is revolving in a table closed mode, or after 3 revolutions of the rotor after the winning number state has occurred.

State 2 indicates the rotor is revolving and no ball is detected in the rotor.



State 3 indicates a ball has been detected in the race track by all three in-rim sensors, i.e. one revolution of the ball.

State 4 indicates the No More Bets state, (the speed of the ball has decreased below the set time value between in-rim sensors).

State 5 indicates Winning Number has been established, by all in-rim sensors detecting the ball in a valid pocket during state 4, with no game errors present.

State 6 indicates that the table is closed or the rotor has not moved for 10 minutes.

Warning Flags

*X;1;021;17;4;148;0

*X;1;021;17;8;146;0

*X;1;021;17;A;144;0

The warning flag outputs a live hexadecimal sum value of occurring faults.

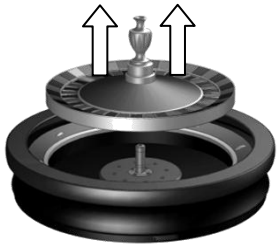
Value 1 warning flag indicates the speed of the wheel exceeds the preset higher and lower values for gaming, less than 10RPM or greater than 30RPM.

Value 2 warning flag indicates the ball is travelling in the same direction as the rotor.

Value 4 indicates failure of an in-rim sensor.

Value 8 indicates a void game. This can be triggered by a slow ball launch speed, or abnormal in-rim or rotor sensing.

Removing the Rotor



Ensuring the turret is secure on the rotor, carefully lift the rotor vertically upwards from the wheel bowl.

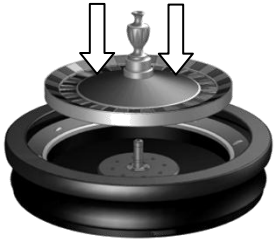
⚠ Only use the turret to lift the rotor.

⚠ **NEVER** lift the rotor at an angle, or force the rotor upwards.

⚠ Rotor weight 15 kg+

For Height Adjustment – 34 **i**

Replacing the Rotor



When replacing the rotor take care not to contact the rotor with the wheel bowl. Lift the rotor using the turret and place centrally and vertically over the bearing spindle.

Allow the rotor to lower onto the bearing spindle gently.

⚠ Only use the turret to lift the rotor.

⚠ **NEVER** force the rotor on to the bearing assembly.

⚠ Do not lubricate the rotor bore or the bearing assembly surfaces during fitting or removal.

Checking Rotor Barcode

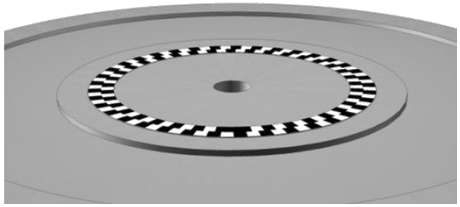
Inspect the barcode and check for any visible damage to the barcode surface or divisions such as scratches or missing parts.

All divisions of the bar code should have clean straight edges and be solid filled for optimum reading.

⚠ Do not damage barcode surface.

Rotor Removal – 41 **i**

Replacing Rotor Barcode



To replace the rotor barcode, remove the backing paper from the new barcode and align the zero section of the barcode, with the current mounted barcode.

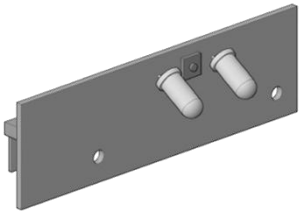
Affix the new barcode over the existing barcode, ensuring the barcode is sitting within the machined recess of the rotor.

⚠ Only use Cammegh supplied barcodes with Cammegh rotors.

⚠ Contact Cammegh for replacement barcodes.

Contact Cammegh – 49 **i**

In-Rim Sensors



Cammegh in-rim sensors are factory set for optimum operation.

The in-rim sensors are mounted beneath the top rim cover, utilising discrete polarised in-rim lenses.

The sensors have been designed and set for maximum response and should not need adjusting.

Do not attempt sensor calibration or remove the top rim cover unless guided or trained by a Cammegh Engineer.

Servicing In-Rim Sensors

It is recommended that any servicing of in-rim sensors is only performed under the guidance of a Cammegh Engineer.

Please contact Cammegh should you wish to proceed with calibration of the In-Rim sensors or suspect failure of the in-rim sensor system.

Contact Cammegh – 49 ◀

Starlight Gaming*

*For Starlight models only:

The rotor colour is white at the start of the game, and when in idle mode.
Protocol State 1,2,3,6.

The rotor colour changes red at the no more bets event.
Protocol State 4.

The rotor colour changes back to white when a winning number is output.
Protocol State 5.

In-Rim Sensor Outputs

*SP
* SP1 13.3
* SP2 13.2
* SP3 13.3
* SP0 13.2

The output of each in-rim sensor can be viewed by entering the following command
***SP <enter>**
Asterisk capital 'I' space 'five' space 'one' space 'six' enter key

The sensor output is displayed as the ball moving past the sensor, giving sensor number, pocket number and position.

Cancel Command
*SP <enter>

Reset Game

*R

*X;1.....

The game can be forced to reset by entering the command:-
***R <enter>**
Asterisk capital 'R' enter key

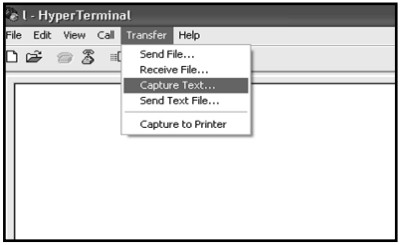
This will reset the current game back to game start status, 1.

Game Text Logging

Hyper Terminal is capable of recording text input data and outputting a text file which can be scanned for gaming issues.

This can be easier to read than the 'live' text of Hyper Terminal application and can be used for gaming analysis.

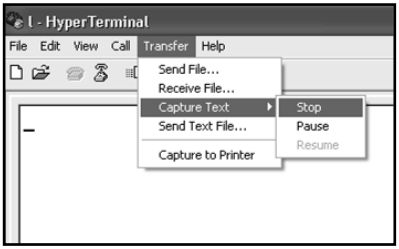
Recording Text Log



From the Transfer menu of the Hyper terminal application, select Capture Text.

Rename the file as required and select the location the file is to be saved in.

The text file starts recording the input to Hyper Terminal.



From the Transfer menu of Hyper Terminal application, select Capture Text, and Stop, to stop the recording.

Double click on the text file to view it using MS Notepad or a similar editor.

The file can be shared or emailed to Cammegh should you have any diagnostics enquires.

Save text capture files as .txt

No More Bets Configuration

The no more bets threshold setting can be changed so the state transition from 3 to 4 can be configured.

The threshold setting is measured in units of RPM of the ball, i.e. when the speed of the ball has decelerated to the threshold value, the no more bets state is initiated.

Later No More Bets

To make the no more bets state transition occur later in the game, i.e. a short no more bets period, decrease the threshold value.

To check the current value setting (default 040), enter the command:-

#?66 <enter>

To set the no more bets threshold, enter the command:-

#!66=nnn <enter>
(where nnn is the new threshold value)

Earlier No More Bets

To make the no more bets state transition occur earlier in the game, i.e. a longer no more bets period, increase the threshold value.

To check the current value setting (default 040), enter the command:-

#?66 <enter>

To set the no more bets threshold, enter the command:-

#!66=nnn <enter>
(where nnn is the new threshold value)

CAMMEGH

5

The World's Finest Roulette Wheel

CAMMEGH Customer Support

Contacting CAMMEGH

CAMMEGH
The World's Finest Roulette Wheel

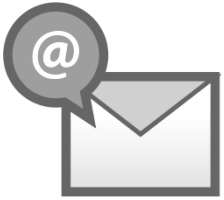
Our expertise is available to all our valued customers queries and we look forward to caring for customers with our Worldwide support.

Should you require assistance with your Cammegh wheel or gaming equipment, please use one of the following methods of contact and observe minimum information requirements to assist us in responding to your enquiry efficiently.

Please visit us at our website:-

Web: www.cammegh.com

Emailing CAMMEGH



Please include the following minimum information in your enquiry:-

- Customer Name
- Customer Location
- Serial number of Wheel
- Type of Wheel (if known)
- Details of Enquiry
- Additional Contact Details

Email: support@cammegh.com

Phoning CAMMEGH

Please include the following minimum information in your enquiry:-

- Customer Name
- Customer Location
- Contact Name
- Contact Number
- Contact Email Address
- Serial number of Wheel
- Type of Wheel (if known)
- Details of Enquiry
- Additional Contact Details

Telephone: +44 (0)1233 820771

CAMMEGH Expert Service

Cammegh pride ourselves with our committed Worldwide expert roulette support service.

Utilising our dedicated team of Cammegh expert engineers, we provide a global site support service to our customer's requirements in:

- Installation
- Training
- Maintenance

Should you require assistance, please contact us.

CAMMEGH Parts Service

Cammegh offer a full parts service for all Cammegh products, including an extensive workshop based roulette wheel overhaul service for existing equipment.

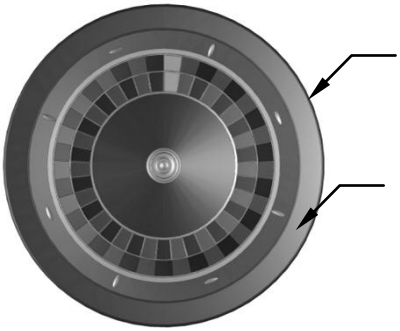
Should you require assistance, please contact us for spare parts or wheel overhauls.

CAMMEGH RS SERIES Technical Specifications

	Wheel Construction			Connectivity		Supply Requirements	
Wheel Model	Bowl Construction	Rotor Construction	Game Sensors	Black Box Controller	Cammegh B.O.B.	Power Supply	Compressed Air
Mercury 360	Laminated wood bowl with ball stops. Garnite™ race track.	Aluminium precision machined. Wood cone. DR or Scallop Separator Ring.	4 In-Rim 1 Rotor	N/A	✓	100-230VAC 0.6 Amp	N/A
Starlight 360	Laminated wood bowl with ball stops. Garnite™ race track.	Acrylic precision machined. 1 Piece construction. DR or Scallop Separator Ring.	4 In-Rim 1 Rotor	N/A	✓	100-230VAC 0.6 Amp	N/A

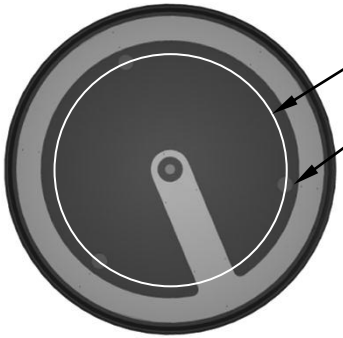
Connection Devices							**Recommended Environment**	
CAMMEGH Billboard™	CAMMEGH Eyeball	CAMMEGH PitBoss™ HQ	CAMMEGH PitBoss™ TD	CAMMEGH PitBoss™ TI	Local Computer	External Server	Temperature Range	Humidity Range
✓	✓	✓	✓	✓	✓	✓	Stabilised 15-30^{0}C	Stabilised 25-50%
✓	✓	✓	✓	✓	✓	✓	Stabilised 15-30^{0}C	Stabilised 25-50%

CAMMEGH RS SERIES Wheel Dimensions



Wheel ∅ 800mm

Top Rim Width 67mm



Foot PCD ∅ 600mm

Foot ∅ 40mm

Top Rim 52mm

Bowl 117mm

Wheel Height 327mm

Foot height adjustment range 20mm

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www.cammegh.com