



ECHOMETER

TAM[©] Operator's Manual Addendum WCGG200 Series

1.) Intended Use: The Echometer Total Asset Monitor System, TAM, is a comprehensive data collection and analysis system that permits the engineer to optimize oil and gas well performance. When evaluating artificial lift wells, the system can monitor the pump inlet fluid level providing the engineer with the data to set pump speed or duty cycle to maximize production. The WCGG200 Gas Gun is one of several HAZLOC instruments intended for use as a Total Asset Monitor system data source.

2.) Installation and Operation:

There is no field assembly of this instrument. This device is a transportable instrument. There is no provision for maintaining or charging while attached to the well. The installation and operating procedures are covered elsewhere in this TAM system manual

3.) Parameters Measured:

- a. Pressure – WCGG200 provides excellent quality pressure data measured in the space between the casing and the production string.
- b. Acoustic Waveform– WCGG200, when manually triggered, produces an acoustic pressure pulse followed by recording the echo reflections.

4.) Specifications:

- a. Working Casing Pressure 1500 PSIG.

b. Pressure Resolution	<0.1 PSIG
c. Acoustic Pulse	Positive or Negative Pressure
d. Acoustic Pulse Gas	CO ₂ , N, or Well Gas Pressure
e. Microphone Signal Precision	24-bit delta-sigma ADC
f. Energy Source	Li-Ion 3.4 AH
g. Run Time per Charge	> 200 Hrs.
h. Charging Source	+5Volts DC
i. Charging Time	≤ 13 Hrs. 0 to 100%
j. Gas Gun Coupling	2" NPT Male

5.) Certification Standards:

UL HAZLOC Group evaluated this product against the following standards:

- a. UL913, Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, Division 1, Group C & D Hazardous (Classified) Locations.
- b. UL60079-0 Explosive atmospheres – Part 0: Equipment – General requirements
- c. UL60079-11 EXPLOSIVE ATMOSPHERES – PART 11: EQUIPMENT PROTECTION BY INTRINSIC SAFETY (i).
- d. CSA C22.2 No. 60079-0 Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements.
- e. CSA C22.2 NO. 60079-11:14 EXPLOSIVE ATMOSPHERES — PART 11: EQUIPMENT PROTECTION BY INTRINSIC SAFETY "i."
- f. CENELEC EN IEC 60079-0 EXPLOSIVE ATMOSPHERES - PART 0: EQUIPMENT - GENERAL REQUIREMENTS.
- g. CENELEC EN 60079-11 EXPLOSIVE ATMOSPHERES - PART 11: EQUIPMENT PROTECTION BY INTRINSIC SAFETY "i".
- h. IEC 60079-0 Explosive atmospheres – Part 0: Equipment – General requirements

- i. IEC 60079-11 EXPLOSIVE ATMOSPHERES – PART 11: EQUIPMENT PROTECTION BY INTRINSIC SAFETY

6.) CERTIFICATION FILE NUMBERS:

- | | | | |
|-----------|-------------------|------------------------|--|
| a. UL | E496830 | US | Class I, Div 1, Groups C&D, T3C
Class I, Zone 0, AEx ia IIB T3 Ga |
| | | CA | Class I, Div 1, Groups C&D, T3C
Ex ia IIB T3 Ga X |
| b. ATEX | UL 24 ATEX 3218X | II 1 G Ex ia IIB T3 Ga | |
| c. IECEX | IECEX UL 24.0033X | Ex ia IIB T3 Ga | |
| d. UKCA | UL24UKEX2982X | II 1 G Ex ia IIB T3 Ga | |
| e. FCC ID | Q5Q-WRFG200 | | |
| f. IC ID | 10048A-WRFG200 | | |

7.) Equipment Certification Label:

-20° ≤ Ta ≤ 50° C

Intrinsically Safe for use in:

IECEX Ex ia IIB T3 Ga
IECEX UL 24.0033X



0539



0843





Performance Optimization
Equipment for Oil and Gas
Wells Located in Hazardous
Locations

(((ECHOMETER)))™

ECHOMETER CO.
5001 Ditto Lane
Wichita Falls, TX USA

II 1 G Ex ia IIB T3 Ga
UL 24 ATEX 3218X
UL24UKEX2982X

1500 PSI WP
Model WCGG200
Charger Um 5 VDC

Class I, Div 1, Grps C&D T3C
Class I, Zone 0, AEx ia IIB T3 Ga

Ex ia IIB T3 Ga X
SÉCURITÉ INTRINSÈQUE



E496830

WARNING! Servicing in a HAZLOC may invalidate Intrinsic Safety
ATTENTION ! L'entretien dans un HAZLOC peut annuler la sécurité intrinsèque.
WARNING! Substitution of Components may impair Intrinsic Safety.
AVERTISSEMENT ! La substitution de composants peut nuire à la sécurité intrinsèque
WARNING! Reference User Guide Supplement Part Number WR1605 for Safe Setup and Use
AVERTISSEMENT ! Référence Supplément au Guide de l'utilisateur Référence WR1605 pour
 Configuration et utilisation sécurisées
WARNING! Charging must be done in a non-hazardous, safe area only.
AVERTISSEMENT ! Le chargement doit être effectué uniquement dans un endroit sûr et non
 dangereux.

8.) Hazards and Warnings:

- a. **WARNING:** Charging this instrument requires using the supplied 5-Volt charger. Note instrument marking UM 5-Volts. Use of an input greater than 5 VDC invalidates the certifications.

AVERTISSEMENT: La charge de cet instrument nécessite l'utilisation du

chargeur. chargeur de 5 volts fourni. Notez le marquage de l'instrument UM 5-Volts. L'utilisation d'une entrée supérieure à 5 VDC invalide les certifications.

- b. **Warning:** Substitution of components may impair intrinsic safety.

Avertissement : La substitution de composants peut compromettre la sécurité intrinsèque.

- c. **Warning:** Operators of this instrument must have training in safety procedures for operating safely in a HAZLOC location before attempting to use this product. This training must include safety procedures when working with flammable pressured gases.

Avertissement: Les opérateurs de cet instrument doivent avoir suivi une formation sur les procédures de sécurité pour travailler en toute sécurité dans un endroit HAZLOC avant de tenter d'utiliser ce produit. Cette formation doit inclure les procédures de sécurité pour travailler avec des gaz inflammables sous pression.

- d. **Warning:** Items in this instrument's electronic enclosure must not be repaired or serviced in HAZLOC locations. Therefore, any disassembly or repair may invalidate the certification.

Avertissement: Les éléments du boîtier électronique de cet instrument ne doivent pas être réparés ou entretenus dans des zones HAZLOC. Par conséquent, tout démontage ou réparation peut invalider la certification.

- e. **Warning:** Should any problem occur with the battery assembly, contact your Echometer-authorized engineer for assistance.

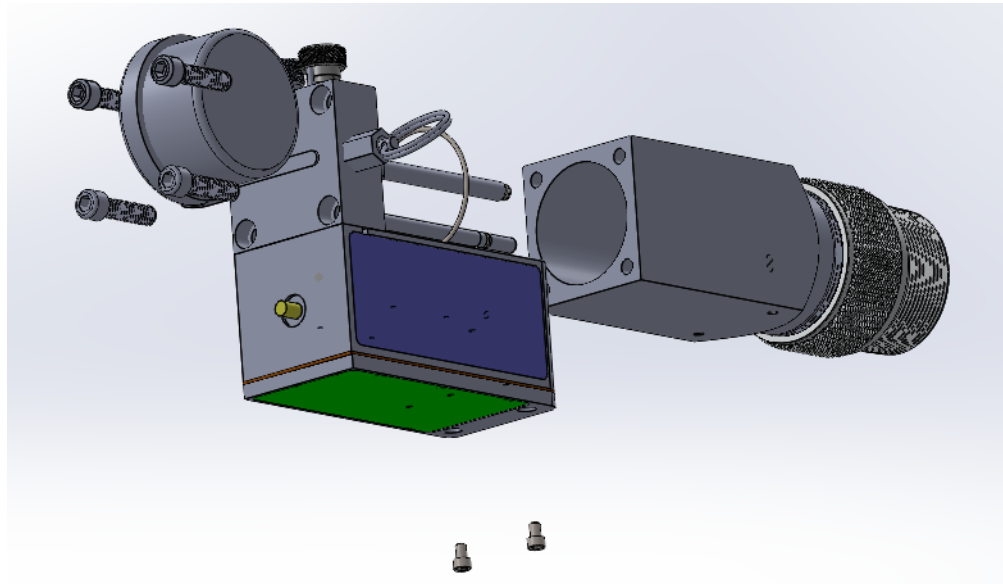
Avertissement: En cas de problème avec l'assemblage de la batterie, contactez votre ingénieur agréé Echometer pour obtenir de l'aide.

- f. **Warning:** Battery charging must occur in an ORDLOC.

Avertissement: La charge de la batterie doit se faire dans un ORDLOC.

9.) Care and Maintenance: Routine cleaning procedures are required. These procedures do not involve exposing any safety-related items.

- a. The WCGG200 can produce a rarefaction acoustic pulse using the casing gas pressure. The volume chamber is bled to atmospheric pressure. The valve separating the casing pressure and the volume chamber is rapidly opened, resulting in a rapid pressure drop of the casing gas at the microphone. This pressure recovers as the casing gas fills the volume chamber. Depending on the cleanness of the casing gas, contaminants may build up in the gun chamber and interfere with the firing valve.



The chamber and valve may be accessed without exposing the electronics assembly. The above illustration shows the volume chamber and microphone separated for cleaning. Removal steps follow:

- i) Remove the microphone assembly from the bottom of the gun. It is retained by one 10-32 seal screw. After removing the screw, gently pull the microphone while twisting until the microphone is free. Remove and discard the two O-Rings from the microphone mounting surface.
- ii) Remove the four 5/16" cap screws from the top cap, as shown in the top left in the illustration above.
- iii) Remove the two 8-32 cap screws below the FCC label.

- iv) Carefully pull the gun body directly away from the cap. Do not move from side to side or away from the electronics housing. Doing so may damage sealing surfaces.
- v) When the gun body is separated from the cap and electronics, remove it and set it aside.
- vi) Remove the O-ring from the groove in the cap.
- vii) Three tubular-shaped devices protrude from the bottom surface of the cap. One is a tube enclosing a wire from the microphone, one is the tube that presents well pressure to a sensor on the side of the cap facing the electronics section, and the last is the movable part of the firing valve. It is not recommended to remove the two tubes unless you are experiencing chamber leakage.
- viii) Remove the valve by pulling the firing ring to release the valve. While the trigger ring is pulled, remove the valve.
- ix) Clean the valve seat in the cap with a suitable solvent. Use a Q-tip to clean the hole in the cap assembly. Clean the remaining surface area of the cap assembly.
- x) Remove the O-rings from the valve shuttle. Clean the valve shuttle and inspect the ends to determine if scratch marks are present on the O-ring seal areas. If damage is found, replace the valve.
- xi) Lubricate the valve area in the cap assembly and the shuttle valve O-ring grooves. Next, install three new O-rings and lubricate the ring's outer surfaces.
- xii) Reinstall the valve in the cap while pulling the firing ring and inserting the valve until the flange contacts the cap assembly.
- xiii) Clean the gun body chamber interior and the sealing surfaces on the body floor.
- xiv) Place the gun body over the tubes and gas valve. Be sure the housing 8-32 tapped holes are oriented toward the electronics housing. Be sure the cap assembly seal O-ring is in place in the cap groove.
- xv) Carefully start the tubes extending from the Cap Assembly into their respective holes in the gun body floor. Ensure the gun body is aligned with

the electronics housing when performing this assembly.

- xvi) Push the gun body toward the cap assembly until the gap is closed.
- xvii) Install the four 5/16 cap screws through the four counterbored holes in the top of the cap and engage the tapped holes in the gun body. Finger-tighten the screws.
- xviii) Install the two 8-32 cap screws through the lower deep counterbores in the electronics housing. Finger-tighten the cap screws.
- xix) Secure the four 5/16 cap screws.
- xx) Secure the two 8-32 cap screws.
- xxi) Clean the microphone mounting surface. Lubricate the two O-Ring counterbores and install new O-Rings.
- xxii) Locate the larger hole on the microphone surface and place the microphone firmly against the pressure chamber. Verify the O-Rings did remain in place.
- xxiii) Secure the microphone with the seal screw.

10.) Care of Li-Ion Battery:

- i. The Li-Ion battery is rated for total capacity after 300 complete charge/discharge cycles.
- ii. The practice of shallow charge/discharge cycles will not reduce energy capacity.
- iii. The battery operating temperature limits are -20° to 50°C
- iv. Charge this instrument using the supplied Battery Charger.
- v. The battery temperature storage specification is -20°C to 50°C.

11.) Compliance Statements:

ISED non-interference disclaimer

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with the Canadian ICES-003 Class A specifications. CAN ICES-003(A) / NMB-003 (A).

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempt de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

ISED/FCC RF Exposure statement

This equipment complies with FCC and ISED RSS-102 radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. In order to avoid the possibility of exceeding the FCC and ISED RSS-102 radio frequency exposure limits, this equipment should be installed and operated with minimum distance 20 cm (7.9 inches) between the antenna and your body during normal operation. Users must follow the specific operating instructions for satisfying RF exposure compliance.

Cet équipement est conforme aux limites d'exposition aux rayonnements FCC et ISED CNR-102 établies pour un environnement non contrôlé. Cet émetteur ne doit pas être installé ou utilisé en conjonction avec une autre antenne ou un autre émetteur. Afin d'éviter la possibilité de dépasser les limites d'exposition aux radiofréquences FCC et ISED, cet équipement doit être installé et utilisé avec une distance minimale de 20 cm (7.9 pouces) entre l'antenne et votre corps pendant le fonctionnement normal. Les utilisateurs doivent suivre les instructions spécifiques d'utilisation pour respecter la conformité à l'exposition aux RF.

RSS-Gen Transmit antenna statement

This radio transmitter [IC: 10048A-WRFG200] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Le présent émetteur radio [IC : 10048A-WRFG200] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

Under Innovation, Science, and Economic Development regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter byISED. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p) is not more than that necessary for successful communication.

Conformément à la réglementation d'Innovation, Sciences et Développement économique Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Innovation, Sciences et Développement économique Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Approved Antenna Types:

	Antenna type 1
Maximum gain:	1.6 dBi
Antenna type:	Whip
Radiation pattern:	Omni-Directional
Impedance:	50 Ohm
Connector type:	RP-SMA

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation. Please note that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

12.) Revisions:

Revision Level	Date	Description
A	-	Initial Release
B	2/4/2025	Added Compliance Statements DCN-6103