

# ENDOSCOPE AUTO LEAK TESTER ELT-2000

Automatic Test Device  
for Detecting Leak in an Endoscope

Instruction Manual



# ENDOSCOPE AUTO LEAK TESTER

## ELT-2000

Automatic Test Device for Detecting Leak in an Endoscope

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I n s t r u c t i o n   M a n u a l

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## 1 Precautions before use

- Place this instruction near you and refer to it.
- For using it safely and correctly, please read this precautions before use.
  - **Warning:** If mishandled, it contains to specify that people can be killed or injured.
  - **Caution:** If mishandled, it contains to specify that people can be injured or material damages can be occurred.

\* It may be dangerous if the manual is not used as specified.

### 1-1. (Warning) for the power adapter

- Please use the proprietary power adapter!
- Do not touch it with wet hands!
- Do not bend too much and damage the power connection.

### 1-2. (Warning) for handling the inner battery

- Prohibitions for prevention of shocks, fires, and explosions.
  - Do not drop or impact the product containing the internal battery!
  - Do not place the product on a hot surface.
  - Test the product every three months.
  - Lifetime of the fully charged battery depends on the operation environment, number of charges, and hours of use.
  - Assure the internal battery is discharged even not in use.
  - The internal battery is consumable, so have the product tested when the lifetime of the battery is reduced by more than half.

\* CAUTION : RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.  
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

### 1-3. (Warning) Preventing moisture absorption

- Use in a dry environment!
- Do not use in an environment where water drops are likely!
- Please, use the waterproof sheet where there is water!  
(If required, use the provided waterproof sheet)

## 1-4. (Caution) for the data management of the internal memory

- **Saved data on the internal memory and SD card can be damaged.**
  - According to the data management methods in article of 7-6, you must back up the data daily or monthly.
- **Before passing 12 months from this month, back up the data.**
  - The data passing 12 months will be saved on the SD card, and will be deleted from the internal memory. In the process, saved data on the internal memory and SD card can be damaged.
- **Before changing the current time at the configurations, back up the data!**
  - If you change the current time, the data passing 12 months on the internal memory will be saved to the SD card, and delete the data on the internal memory. In the process, saved data on the internal memory and SD card can be damaged.

## 1-5. (Caution) for general use

- Please, use this product after fully understanding these instructions!
- Do not use it for any other purpose, except testing leakage!
- Do not use any other hose or connector, except the proprietary ones!
- Do not dismantle or remodel the body or coil hoses of the product!
- Do not bend the coil hose too much!
- Do not press it when the hose is not fully connected!
- Do not drop it or impact its body!
- Please, repeat the test 2 ~ 3 times to increase the accuracy of results.
- Although the test result shows **PASS**, it is recommended to test regularly by [Normal] mode because some very small leaks may exist.
- When the test result shows **LEAK**, confirm the leaking point by testing by [Normal] mode.
- The test results may change slightly depending on the temperature, humidity, expansion coefficient, and the restoring force of the testing system.

## 1-6. Explanation of symbols used

Symbol	Reference	Description
	IEC 60417-5031 (2002-10)	Direct current
	IEC 7000-0434B (2004-01)	caution
	IEC 60417-5172 (2003-02)	Equipment protected throughout by double insulation or reinforced insulation

## 1 Précautions avant utilisation

- Placez ce manuel d'instructions près de vous et consultez-le.
- Pour l'utiliser correctement et en toute sécurité, veuillez lire ces précautions avant de l'utiliser.
  - Avertissement : En cas de mauvaise manipulation, il convient de préciser que des personnes peuvent être tuées ou blessées.
  - Attention : En cas de mauvaise manipulation, il convient de préciser que des personnes peuvent être blessées ou que des dommages matériels peuvent être causés.

\* Il peut être dangereux si le manuel n'est pas utilisé comme indiqué.

### 1-1. (Avertissement) pour l'adaptateur électrique

- Veuillez utiliser l'adaptateur électrique propriétaire !
- Ne le touchez pas avec des mains mouillées !
- Ne pas trop plier et endommager la connexion électrique.

### 1-2. (Avertissement) pour la manipulation de la batterie interne

- Interdictions pour la prévention des chocs, des incendies et des explosions.
  - Ne laissez pas tomber ou ne donnez pas de chocs au produit contenant la batterie interne !
  - Ne placez pas le produit sur une surface chaude.
  - Testez le produit tous les trois mois.
  - La durée de vie de la batterie entièrement chargée dépend de l'environnement de fonctionnement, du nombre de charges et des heures d'utilisation.
  - Assurez-vous que la batterie interne est déchargée même si vous ne l'utilisez pas.
  - La batterie interne étant consommable, faites tester le produit lorsque la durée de vie de la batterie est réduite de plus de la moitié.

\* ATTENTION : RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE PAR UN TYPE INCORRECT.  
JETEZ LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS

### 1-3. (Avertissement) Prévention de l'absorption d'humidité

- A utiliser dans un environnement sec !
- Ne pas utiliser dans un environnement où des gouttes d'eau sont susceptibles de tomber !
- Veuillez utiliser la feuille imperméable là où il y a de l'eau !  
(Si nécessaire, utilisez la feuille imperméable fournie)

## 1-4. (Attention) pour la gestion des données de la mémoire interne

- Les données enregistrées dans la mémoire interne et sur la carte SD peuvent être endommagées.
  - Selon les méthodes de gestion des données de l'article 7-6, vous devez sauvegarder les données quotidiennement ou mensuellement.
- **Avant de passer 12 mois à partir de ce mois, sauvegardez les données.**
  - Les données dépassant 12 mois seront sauvegardées sur la carte SD, et seront supprimées de la mémoire interne. Au cours de ce processus, les données enregistrées sur la mémoire interne et la carte SD peuvent être endommagées.
- **Avant de modifier l'heure actuelle dans les réglages, sauvegardez les données !**
  - Si vous modifiez l'heure actuelle, les données des 12 derniers mois de la mémoire interne seront enregistrées sur la carte SD et les données de la mémoire interne seront supprimées. Au cours de ce processus, les données enregistrées sur la mémoire interne et la carte SD peuvent être endommagées.

## 1-5. (Attention) pour un usage général

- Veuillez utiliser ce produit après avoir bien compris ces instructions !
- Ne l'utilisez pas à d'autres fins, sauf pour tester les fuites !
- N'utilisez pas d'autres tuyaux ou connecteurs, à l'exception de ceux de marque déposée !
- Ne pas démonter ou remodeler le corps ou les tuyaux de la bobine du produit !
- Ne pliez pas trop le tuyau de la bobine !
- Ne pas appuyer sur l'appareil lorsque le tuyau n'est pas complètement connecté !
- Ne le laissez pas tomber et ne donnez pas de chocs au corps principal !
- Veuillez répéter le test 2 ~ 3 fois pour augmenter la précision des résultats.
- Bien que le résultat du test indique **PASS** il est recommandé de tester régulièrement en mode **[Normal]** car de très petites fuites peuvent exister.
- Lorsque le résultat du test indique **LEAK** confirmez le point de fuite en testant en mode **[Normal]**.
- Les résultats des tests peuvent varier légèrement en fonction de la température, de l'humidité, du coefficient de dilatation et de la force de rappel du système de test.

## 1-6. Explication des symboles utilisés

Symbol	Reference	Description
	IEC 60417-5031 (2002-10)	Description
	IEC 7000-0434B (2004-01)	attention
	IEC 60417-5172 (2003-02)	Équipement protégé tout au long par une double isolation ou une isolation renforcée

## 2 Description of components

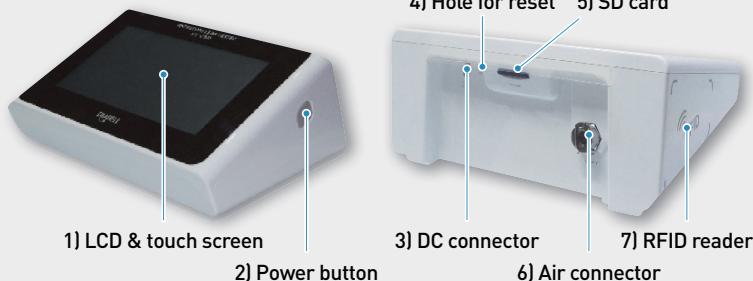
1. Leak tester unit  
(Leak tester, Device)
2. One SD card
3. One SD card reader
4. Two RFID tags for the tester
5. Three RFID tags for the scope

6. One power adapter  
(AD/DC adapter, +5V, 2000 mA)
7. One coil hose
8. Three waterproof sheets
9. Instruction manual  
(Quality Assurance included)

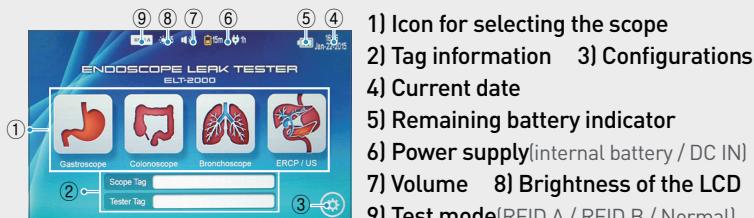
- \* If required, components are available to purchase separately.
- \* Coil hoses are available to purchase according to manufacturers.  
- O (Olympus), E (EndoChoice), P (Pentax), F (Fujinon), and others.
- \* If you want to use the Bluetooth printer, you have to purchase it as an option.

## 3 The name of each part

### 3-1. The names of exterior parts



### 3-2. The names of display parts



## Equipment installation

- **Make sure that the place where the leak tester is placed is flat.**  
\* If not, the leak tester can be dropped.
- **Check the temperature difference between the device and its environment.**  
\* If there is a severe difference of temperature, its results would not be accurate due to contraction and expansion.

### 4-1. Preparation of the power supply

- **Connect the power adapter to the power connector(DC IN) on the backside.**
- **When remaining battery indicator shows one block, connect the power adapter.**
  - If you connect the power adapter, the internal battery will be automatically charged.

#### 4-1-1. RESET

- **If you push the reset switch that is on the backside, the leak tester will be initialized.**
  - Using a tool for reset (clip or pin), push the reset switch inside the hole.
  - If the function is operated, the tester will automatically turn off.

#### 4-1-2. Power on

- **Keep pressing the power button till the screen turns on.**
  - \* If there is no change for a while (about 5seconds), or if the device is switched off after displaying the logo, connect the power adapter.  
The battery may need charging.
  - \* If the same situation occurs after connecting the adapter, have it tested!

#### 4-1-3. Power off

- **Keep pressing the power button till the screen turns off, the screen displays a message of “Good Bye”, then the power will be turned off.**
  - \* If there is no change for a while (about 5 seconds), the leak tester

should be reset.(see: 4-1-1. Reset).

## 4-2. Connection of coil hose

- **Connect the coil hose to the air connector of the leak tester and of the scope respectively.**
  - The coil hose can be differed by the manufacturers of scopes (O, E, P, F and others)  
(O: Olympus, E: EndoChoice, P: Pentax, F: Fujinon, and others)
  - If it is not compatible, please call the seller for service.

5

# Test methods

- **There are three modes such as [RFID A], [RFID B], and [Normal] mode, and the mode can be selected at the checking option on the setting screen.**  
(See the article of 7-3. How to select the test mode)
  - \* When leaks are found, the location of leak should be checked in water tank after rechecking.

## 5-1. [RFID A] mode

- **It is a method to test with both [Scope tag] and [Tester tag]**



Main screen



Test screen

## 5-1-1. Test method by using both [Scope tag] and [Tester tag]

- ① **Touch the [Scope tag] to the RFID reader on the side of the leak tester.**
  - If the reading is successful, it generates a beep sound.
  - Information of the touched tag is displayed on the screen.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11

- ② **Touch the [Tester tag] to the RFID reader on the side of the tester.**
  - If the reading is successful, it generates a beep sound.
  - Information of the touched tag is displayed on the screen.
  - \* If the reading fails, it means that the tag has no registered information. Hence, you must register it. (See: 7-5. Registration and management of tags)
  - \* The [Scope tag] and [Tester tag] that have already been registered in other leak testers are automatically registered while reading, without any other registration process.
- ( Test )
- ③ **When the leak tester recognizes both the [Scope tag] and [Tester tag], it moves automatically to the test screen, then starts to test.**
- ④ **Once test starts, rotate the handle according to the indication of the screen.**
  - \* If you want to stop the test while putting pressure, touch the **Auto** button, then it will stop putting pressure, exhausting the internal air automatically.
- ( Completion of the test )
- ⑤ **When the test is completed, test results will be displayed and related information will be saved on the internal memory, while the internal air is automatically exhausted.**

[The test date / management number of the tester / model and management number of the scope / testers' management number / test results / measured value of leak / the number of test times depending on the type of scope (See: 7-6-4)]
- ( Recheck )
- **If the value of resultant leaks is between [Leak Level] and [Recheck] level, it tests automatically one more time, then displays the result.**

**Please refer to the [Scope Option/Manager Mode] for [Leak Level] and [Recheck] level. (See: 7-7)**

[ex. If the level of leaks is (-3), and the level of repressured leaks is (-5), it tests automatically one more time when the resultant value is between -3 and -5 mmHg.]

  - \* When [Leak Level] is larger than the [Recheck] level, [Recheck] function does not operate.

## 5-1-2. Test method by using tags on the [Test screen] state

- Repeat the process, from ① to ⑤, of the article of 5-1-1.

## 5-1-3. Test methods by using button

( Selecting the type of the scope )

- Among the icons of the scope such as     , touch the icon button to test.

- It will be switched to [Test Screen].

( Test )

- On the [Test screen], touch the  button.

- It starts to test. (See the article of 5-1-1.)

\* The results obtained by the  button is not saved on the internal memory.

## 5-1-4. Manual test by using the button

\* This method is used to check the location of leak in water tank.

( Test )

- On the [Test screen], touch the  button.

- It automatically starts to put pressure.

\* The level of putting pressure can be controlled on the configuration.

- If you want to stop putting pressure, touch the  button, then it will stop putting pressure, exhausting the internal air automatically.

- When it stops putting pressure, check the place where the bubbles are created.

( Completion of the test )

- When the test is completed, stop the operation by touching the  button.
- When the operation is completed, the internal air is automatically exhausted.

## 5-2. mode

- It is a way of using only the [Scope tag].



Main screen

Test screen

## 5-2-1. Test methods by using only the [Scope tag]

### ( Inputting tags )

① **Touch the [Scope tag] to the RFID reader on the side of the tester.**

- If the reading is successful, it generates a beep sound.
- Information of the touched tag is displayed on the screen.
- \* If the reading fails, it means that the tag has no registered information. Hence, you must register it.
- \* The [Scope tag] that has already been registered in other leak testers are automatically registered while reading, without any other registration process.

### ( Test )

② **When the leak tester recognizes the [Scope tag], it moves automatically to the test screen, then starts to test.(The tester is displayed as a guest.)**

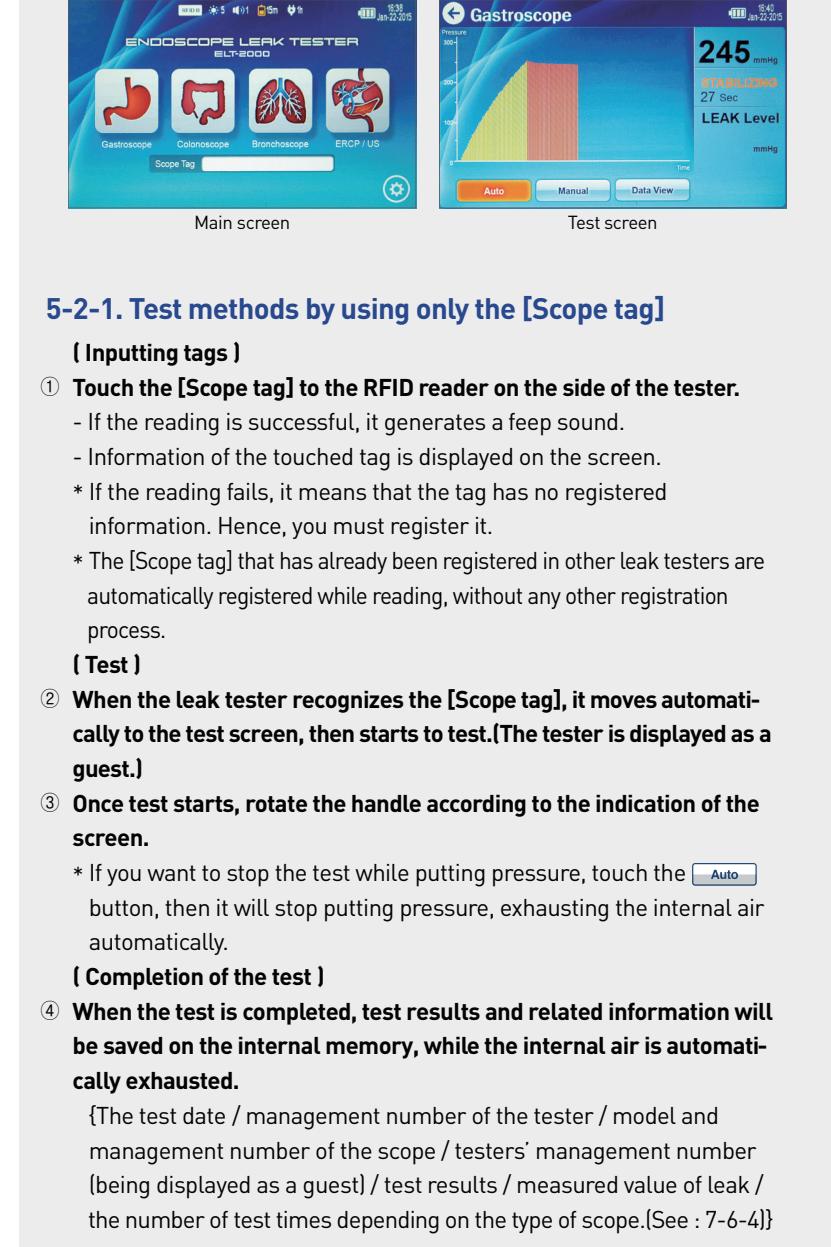
③ **Once test starts, rotate the handle according to the indication of the screen.**

- \* If you want to stop the test while putting pressure, touch the **Auto** button, then it will stop putting pressure, exhausting the internal air automatically.

### ( Completion of the test )

④ **When the test is completed, test results and related information will be saved on the internal memory, while the internal air is automatically exhausted.**

{The test date / management number of the tester / model and management number of the scope / testers' management number (being displayed as a guest) / test results / measured value of leak / the number of test times depending on the type of scope.(See : 7-6-4)}



- (Recheck)

If the value of resultant leaks is between [Leak Level] and [Recheck] level, it tests automatically one more time, then displays the result. Please refer to the [Scope Option/Manager Mode] for [Leak Level] and [Recheck] level. (See: 7-7)

\* When [Leak Level] is larger than the [Recheck] level, [Recheck] function does not operate.

### 5-2-2. Test method by using tags on the [Test screen] state

- Repeat the process, from ① to ④, of the article of 5-2-1.

### 5-2-3. Test method by using [Auto] button

- The test method is the same as the article of 5-1-3.

### 5-2-4. Manual test by using the **Manual** button

- The test method is the same as the article of 5-1-4.

### 5-3. **Normal** mode

- This test method is to test the endoscope without the [Scope tag].



Main screen

Test screen

### 5-3-1. Test method by using the **Auto** button

- The test method is the same as the article of 5-1-3.

### 5-3-2. Manual test by using the **Manual** button.

- The test method is the same as the article of 5-1-4.

### 5-4 positioning for disconnection

- Separate the power adapter and coil hose connected to the main body.

## 6 Data View



Test screen



Data View screen

- On the test screen, touch the **Data View** button.
  - It displays the screen of the data view.
  - It displays the recent data of the test.
- Using the drop down scope selection button **Gastro**, select the scope what you want to search. (Gastro, Colono, Broncho, ERCP/US, All)
  - It displays the test data for the type of the selected endoscope.
- Return to the [Test screen] using the **○** button.
- To delete the data and copy them on the SD card, see [7-7 Data management].

## 7 Configuration(Setting)



Main screen



Setting screen

- On the main screen, touch the **○** button.
  - It moves to the [Setting screen].

### 7-1. How to set Date & Time **Date & Time**

- Click the **○ +** buttons of the month, date, year, hour, minute, and second.
  - The setting values are decreased / increased.

## 7-2. How to set [Auto Power Off] time Auto Power Off

### 7-2-1. How to set the time when using the internal battery

- Click the 15m button.
  - In the case of using the internal battery only, when not in use, the leak tester automatically turns off after 15 minutes.
- Click the 30m button.
  - In the case of using the internal battery only, when not in use, the leak tester automatically turns off after 30 minutes.

### 7-2-2. How to set the time when using the power adapter

- Click the 1h button.
  - In the case of using a power adapter, when it is not in use, the leak tester automatically turns off after 1 hour.
- Click the 2h button.
  - In the case of using a power adapter, when it is not in use, the leak tester automatically turns off after 2 hours.

## 7-3. How to select the test mode Checking Option

### 7-3-1. How to select RFID A mode

- It is a method to test leaks by using both [Scope tag] and [Tester tag].
  - It will save the data of the test.
  - According to the process of 5-1, perform a test.

### 7-3-2. How to select RFID B mode

- It is a method of using only the [Scope tag].
  - It will save the data of the test.
  - According to the process of 5-2, perform a test.

### 7-3-3. How to select Normal mode

- **It is a method to test leaks without the [Scope tag].**
  - It will not save the data.
  - According to the process of 5-3, perform a test.

### 7-4. Setting the speaker Audio Setting

- **Using the ON OFF buttons, change the function of the speaker to ON/OFF.**
- **Using the - + buttons, control the volume of the audio system.**

### 7-5. Registration and management of tags Reg / Modify

- **It manages the data information of the [Scope tag] and [Tester tag].**
  - Input the information of hospital.
  - Register and modify the [Tester tag]
  - Register and modify the [Scope tag]

#### 7-5-1. How to register and modify the name of hospital, department, and management number



( Inputting the [password] )

- ① Touch the **[RFID Reg]** button on the [Setting screen].
- ② When it generates input box, touch the **[OK]** button after entering the password of four digits.
  - \* Default password is 0000. Please change password to manage the data.
- ③ If the password is confirmed, it moves to the [Medical registration] screen.

( Inputting the **[Medical Center]** )

- ④ Touch the **[Reg / Mod]** button of the [Medical Center], then it moves to the [Keyboard screen].
- ⑤ Enter the name of the hospital, up to 16 characters including letter and number.
- ⑥ After entering it, touch the **[OK]** or **[Enter]** button.

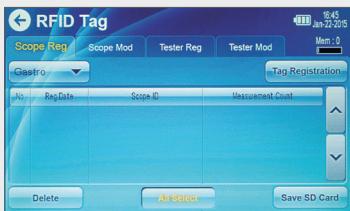
( Inputting the **[Department]** )

- ⑦ Touch the **[Reg / Mod]** button of the [Department], then it moves to the [Keyboard screen].
- ⑧ Enter the name of the department, up to 16 characters including letter and number.
- ⑨ After entering it, touch the **[OK]** or **[Enter]** button.

( Inputting the **[Device ID]** )

- ⑩ Touch the **[Reg / Mod]** button of the [Device ID], then it moves to the [Keyboard screen].
- ⑪ Enter the name of the Device ID, up to 4 characters including letter and number, which is not to duplicate the ID of other devices.
  - \* If the management number is duplicated, the tester can not be discriminated from the leak data.
- ⑫ After entering it, touch the **[OK]** or **[Enter]** button.
- ⑬ Touch the **[OK]** button, and move to the next step.
  - \* If there are no names of hospital, department, and device ID, it will not proceed to the next step.

## 7-5-2. How to register the [Tester tag]



Tester Tag registration screen



Keyboard screen

### ( Selecting Tester tag registration )

① Touch the **Tester Reg** tab button.

- The screen will display the latest tester tag data among the registered information saved on the internal memory.

### ( Inputting the Tester ID )

② Touch the **Tag Registration** button.

③ Input the Tester ID you want to register.

- Input the ID up to 13 characters including letter and numbers, which is not to duplicate.

\* If the management number is duplicated, the tester can not be discriminated from the leak data.

### ( Registration of tags )

④ After completing entering it, touch the **OK** or **Enter** button.

⑤ When it displays the [Contact Tester Tag to the RFID Reader] window, touch the [Tester tag] to the RFID reader on the side of the tester.

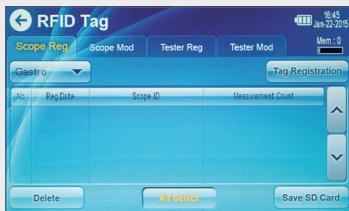
\* If two tags are neighbored, errors may occur. Therefore, touch only one of them.

- When the registration is completed, device ID and tester ID will be saved on the RFID tag of the tester and the memory of the tester.

- When the registration is completed, it generates a beep sound.

- If failed, it generates two beep sounds (beep beep).

### 7-5-3. How to modify the [Tester tag]



Tester Tag modification screen



Keyboard screen

#### ( Select Tester tag modification )

- **Touch the Tester Mod tab button.**

- The screen will display the latest tester tag data among the registered information saved on the internal memory.

#### ( Reading Tags )

- ① **Touch the Tag Registration button.**

- ② **When it displays the [Contact Tester Tag to the RFID Reader] window, touch the tag for the tester that you want to change to the RFID reader on the side of the tester.**

\* If two tags are neighbored, errors may occur. Therefore, touch only one of them.  
- If the reading is successful, it generates a beep sound.  
- Information of the touched tag is displayed on the indicator of the tester ID.

#### ( Change of the tester ID )

- ③ **Change the tester ID that is not the same as other IDs, up to 13 characters including letter and number.**

\* If the management number is duplicated, the tester can not be discriminated from the leak data.

#### ( Registration of tags )

- ④ **When you complete changing it, touch the OK or Enter button.**

- ⑤ **When it displays the [Contact Tester Tag to the RFID Reader] window, touch the tag for the tester that you want to register to the RFID reader on the side of the tester.**

\* If two tags are neighbored, errors may occur. Therefore, touch only one of them.

- When you complete the registration, changed device ID and scope ID will be saved on the RFID tags for tester and the memory of tester.
- When the registration is completed, it generates a beep sound.
- If the registration is failed, it generates two beep sounds (beep beep).

#### 7-5-4. How to register the [Scope tag]



Scope Tag registration screen



Keyboard screen

##### ( Selecting Scope tag registration )

- ① Touch the **Scope Reg** tab button.

- The screen will display the latest tester tag data among the registered information saved on the internal memory.

##### ( Selecting the type of scopes )

- ② Using the drop down scope selection button **Gastro**, select the scope that you want to search.

##### ( Inputting the scope ID )

- ③ Touch the **Tag Registration** button.

- ④ Enter the scope ID to register.

- Enter the scope ID that is not the same as other ID, up to 13 characters including letter and number.

- \* If the scope ID is duplicated, the scope can not be discriminated from the leak data.

##### ( Registration of tags )

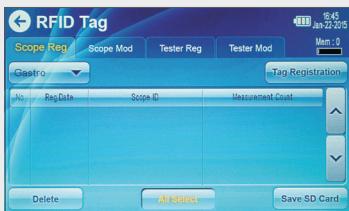
- ⑤ Touch the **OK** or **Enter** button.

- ⑥ When it displays the [Contact Tester Tag to the RFID reader] window, touch the tag for the scope to register to the RFID reader on the side of the tester.

- \* If two tags are neighbored, errors may occur. Therefore, touch only one of them.

- When you complete the registration, changed device ID and scope ID will be saved on the RFID tags for the scope and the memory of tester.
- When the registration is completed, it generates a feep sound.
- If the registration is failed, it generates two feep sounds (feep feep).

## 7-5-5. How to modify the [Scope tag]



Scope Tag modification screen



Keyboard screen

### ( Select Scope tag modification )

① **Touch the Scope Mod tab button.**

- The screen will display the latest tester tag data among the registered information saved on the internal memory.

### ( Reading tags )

② **Touch the Tag Registration button.**

③ **When it displays the [Contact Tester Tag to the RFID Reader] window, touch the tag for the scope to register to the RFID reader on the side of the tester.**

- \* If two tags are neighbored, errors may occur. Therefore, touch only one of them.
- If the reading is successful, it generates a feep sound.
- Information of the touched tag is displayed on the indicator of the scope ID.

### ( Change of the scope ID )

④ **Enter the scope ID that is not the same as other IDs, up to 13 characters including letter and number.**

- \* If the scope ID is duplicated, the scope can not be discriminated from the leak data.

### ( Registration of tags )

- ⑤ When the change is completed, touch the **OK** or **Enter** button.
- ⑥ When it displays the [Contact Tester Tag to the RFID Reader] window, touch the tag for the scope to register to the RFID reader on the side of the tester.
  - When you complete the registration, changed device ID and scope ID will be saved on the RFID tags for the scope and the memory of tester.
  - When the registration is completed, it generates a beep sound.
  - If the registration is failed, it generates two beep sounds (beep beep).

### 7-5-6. How to delete the registered tag data



RFID Tag registration screen

- Touch the tab button to delete.(Scope Reg, Scope Mod, Tester Reg, Tester Mod)
- Select the contents to delete by touching the line.
  - If you want to select all, touch the **All Select** button.
- Touch the **Delete** button.
  - Touch the [OK] button, when it displays a confirmation window for data deletion.

## 7-5-7. How to copy the registered tag data on SD card



RFID Tag registration screen

- **Select the contents to copy by touching the line.**

- If you want to select all, touch the **All Select** button.

- **Touch the **Save SD Card** button.**

- A message after saving will be displayed - Successfully saved data in SD card.

- The saved data can be found at the "Notepad" or "Excel" in the computer.

**File Name : Tag.txt      Type : Text      Data Format : See the example**

### ( Example of Tag.txt )

[Head]

Ver= V1.03

Model= ELT-2000

Medical\_Center= MedCen

Department= Dep

Equipment ID= EqIP

### [Tester Tag Registration]

Reg.Data	Tester_ID	Used_Count
2014-08-24	EqIP-P-1234567890abc	99999

### [Scope Tag Registration]

Reg.Data	Scope_ID	Tested_Count
2014-08-24	EqIP-G-1234567890abc	99999

\* Data format can be changed for the quality improvement without notice.(Refer to homepage)

## 7-6. Data management



Setting screen

Data Management						
Medical Center / Internal Med						
Date	Scope	Scope ID	Tester ID	Result	Link	Tested
Dec-01/2014 14:51	Colon	Scope1	Guest	Pass	0.8	5
Dec-02/2014 14:49	Colon	Scope1	Tester1	En-02		4
Dec-02/2014 14:49	Colon	Scope1	Tester1	Pass	0.8	3
Dec-02/2014 14:44	Colon	Scope1	Tester1	Pass	-10	2
Dec-02/2014 14:43	Colon	Scope1	Tester1	En-01		1

Data Management screen



Inputting password screen

Data Management						
Medical Center / Internal Med						
Date	Scope	Scope ID	Tester ID	Result	Link	Tested
Dec-01/2014 14:51	Colon	Scope1	Guest	Pass	0.8	5
Dec-02/2014 14:49	Colon	Scope1	Tester1	En-02		4
Dec-02/2014 14:49	Colon	Scope1	Tester1	Pass	0.8	3
Dec-02/2014 14:44	Colon	Scope1	Tester1	Pass	-10	2
Dec-02/2014 14:43	Colon	Scope1	Tester1	En-01		1

Manager Mode screen

### 7-6-1. Searching test data in the [Data Management]

- ① **Touch the [Data Management] button on the setting screen.**
  - Move to the screen of data management.
  - The screen will display the latest saved data among the registered one that is saved on the internal memory.
- ② **Using the drop down scope selection button [Gastro ▼], select the scope that you want to search. (Gastro, Colono, Broncho, ERCP/US, All)**
  - The screen will display the latest saved data among the registered one that is saved on the internal memory.
- ③ **Touch [ ] button to select the month you want to search.**
  - It displays the found data on the screen.

\* Caution : Searching is only possible within selected one month.

### 7-6-2. Deleting test data in the manager mode

- ① **Touch the [Manager Mode] button on the screen of data management.**
- ② **When it displays the input box window for password, enter 4 digits**

**password and touch [OK] button.**

- If the password is correct, it moves to the [Manager Mode].
- If the password is incorrect, enter it again.
- The screen will display the latest data among the saved one on the internal memory.

**( Scope type selection )**

③ **Using the drop down scope selection button [Gastro ▾], select the scope that you want to search.**

**( Period selection )**

④ **Select the period to search the data by touching the [ ] buttons.**

**( Data selection )**

⑤ **Select the contents to delete by touching the line.**

- If you want to select the whole data of the screen, touch the [All Select] button.

**( Deletion )**

⑥ **If you want to delete data, touch the [Delete] button.**

- Touch the [OK] button, when it displays a confirmation window for data deletion.

### 7-6-3. Copy of searched test data from the internal memory to the SD card

- **Using the drop down scope selection button [Gastro ▾], select the scope that you want to copy.**
- **Select the period to search the data by touching the [ ] buttons.**
- **Touch the [Save SD Card] button.**
  - Copy the searched test data on the SD card.

\* Caution : Saving or searching is only possible within one month

### 7-6-4. Copy of all test data of the selected month from the internal memory to the SD card

- **Select the month you want to copy by touching the [ ] button.**

- **Touch All Select button.**
  - The whole data of the selected month will be selected.  
(Gastroscope, Colonoscope, Bronchoscope, ERCP/US)
- **Touch the Save SD Card button.**
  - Copy selected test data on the SD card.

### 7-6-5. Automatic copy of the data over 12 months on SD card

- The test data which pass over 12 months in the internal memory will be automatically copied on the SD card and at the same time, removed from the internal memory.

### 7-6-6. Copy of the test data of SD card to the computer

- Eject the SD card from the Leak Tester, and insert it to the SD card reader.
- Insert the card reader into the USB port of the computer.
- Copy the data file of SD card to the data folder of the computer.
- Check the copied test data file by using the [Text editor].
- The file name and type of test data are as follows.

**File Name : YYYYMMDD.TXT or YYYYMM.TXT**

**(YYYY:Year, MM:Month, DD:Day)**

**Type : Text (Plain text file)      Data Format : Refer to example**

\* Remark : If the data is opened by [Rich Text.RTF] file type of text editor, the data could be displayed in one line.

### 7-6-7. Checking the test data in the [Mac OS X]

- Open the saved test data by using the text editor.  
(Refer to Mac Office or TextWrangler)

### 7-6-8 . Checking the test data in the [MS windows]

**Checking test data in the [Notepad]**

- Check the test data by double clicking the copied data file, or open the [Plain Text.TXT] by using the text editor.

### ( Example of YYYYMMDD.TXT )

#### [Head]

Ver = 1.03 Model = ELT-2000  
Medical Center = MedCen Department = Dep  
Device ID = 12

#### [Data]

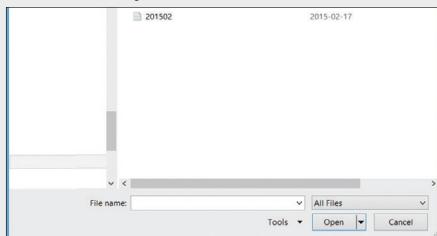
Reg. Date	Scope Type	Scope ID	Tester ID	Result	Leakage	Tested Count
Oct-21-2014 16:05	GastroScope	12-G-32	12-P-432	PASS	-0.7	11
Oct-22-2014 11:47	GastroScope	12-G-002	12-P-003	PASS	-0.7	3
Oct-22-2014 11:49	GastroScope	12-G-002	12-P-003	PASS	-0.4	4
Oct-22-2014 11:50	GastroScope	12-G-002	12-P-003	LEAK	-22.6	5
Oct-24-2014 12:52	GastroScope	12-G-002	12-P-003	ERR-01		9

#### [End]

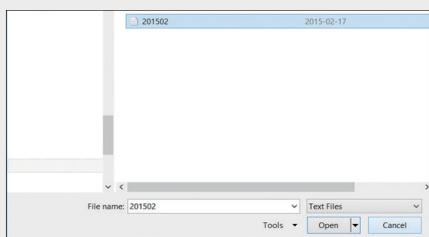
\* Data format can be changed for the quality improvement without notice.

### [ Review with the MS Excel ]

#### 1. Run the 'open file' of the MS Excel.

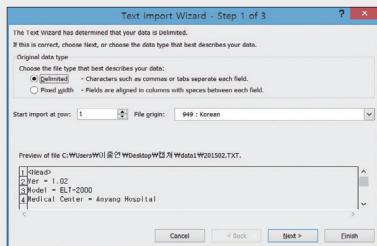


#### 2. Select the file of YYYYMM.TXT



- ① Select the type of text file.
- ② Select the flash disk (SD card).
- ③ Select the file of Data.txt.
- ④ Click the 'open' button.

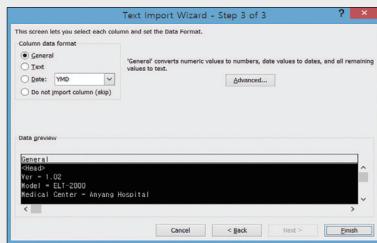
### 3. 1st step to open



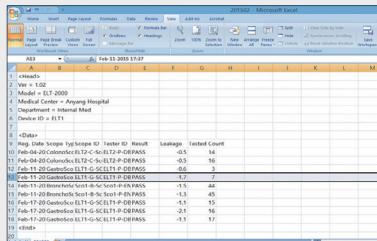
#### 4. 2nd step to open



## 5. 3rd step to open



## 6. Viewing data



- Select the “Delimited” and click the “Next” button.

- Select the “Tab (T)” and click the “Next” button.

- Select the “General” and click the “Finish” button.

- View the converted data from the [Data Management] of the tester.

## 7-7. Scope Options

- In order to test leaks, set the stabilizing time, checking time, leak level, and maximum pressure by the type of endoscope.



Setting screen

Scope	Stabilizing-Time	Checking-Time	Leak-Level	Max Pressure
Gastro	22	18	02	255
Colono	30	18	03	255
Broncho	17	18	03	230
ERCP/US	28	18	03	255
Manual Max Pressure		Recheck	Manual Repressure	
255		2.5	230	
Manager Mode				

Scope option screen



Password screen

Scope	Stabilizing-Time	Checking-Time	Leak-Level	Max Pressure
Gastro	22	18	02	255
Colono	30	18	03	255
Broncho	17	18	03	230
ERCP/US	28	18	03	255
Manual Max Pressure		Recheck	Manual Repressure	
255		2.5	230	
Manager Mode				

Manager Mode screen

- Touch the **Scope Option** button. - It will display the screen of scope option.
- Touch the **Manager Mode** button.
- Enter 4 digits password and touch the **OK** button.
  - If the password is correct, it moves to the [Manager mode screen].
  - If the password is incorrect, enter it again.
- Set the scope type, stabilizing time, checking time, leak level, and maximum pressure using **[-][+]** buttons.
- Set the [Manual Max Pressure], [Recheck], and [Manual Repressure], using **[▼][▲]** buttons.
  - When [Leak Level] is larger than the [Recheck] level, [Recheck] function does not operate.

## 7-8. Setting and changing the password



Setting screen



password screen

- ① **Move to next page of the configuration using  button.**
- ② **Touch the button.**
- ③ **Enter current password when the window to enter password is appeared.** \* Default password is 0000.
- ④ **Touch button after entering a new password.**
  - \* Remember new password because it appears only one time on the star marked buttons.
  - \* In order to confirm the new password, you can check it by going back to the [Scope Option] in the initial [Setting screen].

## 7-9. Setting the brightness of the LCD



Setting screen

- ① **Move to next page of the configuration using  button.**
- ② **Control the brightness of the LCD using   buttons.**

## 8 Upgrading firmware (Homepage: [www.endomaster.co.kr](http://www.endomaster.co.kr))

- Please progress following upgrade procedures after downloading and unzipping the version up file.
  1. Copy SPHOST.BRN on SD card.
  2. Insert the SD card to the tester and turn it on.
  3. The upgrade is automatically done when the screen is turned on, and when it is finished, the power will be turned off automatically.
  4. Turn on the power again, you can find a revision number,[FW Rev. XXX] in the [System Info] by clicking the arrow button on the [Setting screen].
  5. Proceed the test after returning to the main page.

## 9 Cleaning and storage

- Please keep the main body clean.
- Please clean contaminants on main body with dry cloth.
- If the level of contaminant is serious, clean it with a neutral detergent or water dipped cloth. And then rub it with dry cloth.
  - Be careful to prevent water from flowing inside of the tester.
- ( Caution )
- Do not use alcohol, benzene or thinner when removing contaminants.
- ( Caution for storage )
- Please do not store in following locations.
  - Nearby water contents.
  - Location that can be affected by air such as high temperature, moisture, dust, and salt.
  - Places that have impact, vibration, and slope.
  - The places that store chemicals or generate corrosive gas.
- Consumable materials
  - In the case of coil hoses and air connectors, replacement is required if worn according to the frequency of use.

## 10 Troubleshooting

LCD display	Problems	Solutions
<b>ERROR-1</b>	Not reaching the max pressure	Check connection part of air tube.
<b>ERROR-2</b>	Much shorter time to reach the max pressure than the normal	Check connection between waterproof cap of the scope and coil hose connector.
<b>ERROR-3</b>	Inaccurate measurement of the pressure	Please contact the seller if the Error-3 appears after turning on the power repeatedly.
<b>ERROR-4</b>	Leak detection during the stabilization of air	Check the Air Way (It should be completely opened for leak test).
<b>No more than one square of remained battery charging</b> 	Low charging capacity in internal battery	Please use the adapter.
<b>No signal after turning on power</b>	Completely discharged in battery	Please operate tester after connecting adapter for about 30 min. If the problem still exists, request After Service.
<b>No change on display during operation</b>	No change on display	Push RESET switch on the backside, using a tool. If the problem still exists, have it inspected.

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## 11 Product specification

ITEM	CONTENTS	
<b>Name of product</b>	ENDOSCOPE AUTO LEAK TESTER	
<b>Model</b>	ELT-2000	
<b>Display</b>	Digital graphic, 7" color TFT LCD	
<b>Method of measurement</b>	Pressure sensor type	
<b>Display range of pressure</b>	5 ~ 300mmHg	
<b>Measurement range of the leak</b>	0 ~ -99.9mmHg	
<b>Storing capacity of test data</b>	Data capacity for 12 months, Maximum 5,000 per month	
<b>Pressure setting</b>	Max pressure setting type	
<b>Exhausting</b>	Automatic fast exhausting method	
<b>Temperature and humidity in usage environment</b>	+10~+50°C, 15~85%RH	
<b>Temperature and humidity in storage environment</b>	-20~+60°C, 10~90%RH	
<b>power supply</b>	Proprietary Adapter : 100-240VAC 50/60Hz AC-DC Adapter : Dc5v 2,000mA - MAINS supply voltage fluctuations : 100-240VAC	
<b>Range of frequency</b>	13.5603MHz	
<b>Modulation system</b>	ASK	
<b>RFID</b>	<b>The number of channel</b>	1 channel
	<b>Form of radio wave</b>	A1D
	<b>Output</b>	<47.544 mV/m at distance of 10 meter
<b>Weight</b>	920g	
<b>Outer dimension (W x H x D)</b>	223 x 90 x 160 (mm)	
<b>Components</b>	Leak Tester unit, Adapter, SD card, RFID tag, coil hose, SD card reader, instruction manual (including Quality Assurance)	



- \* Name of equipment (Model name) : ELT-2000
- \* Certificated company name : MTS
- \* Producer / production nation : ORACOM / Republic of Korea
- \* Generally speaking, this equipment is not allowed to operate within 20 cm from the human body, thus it is considered as a no SAR tool and the SAR test is not performed.
- \* 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.
- \* Caution : Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.
- \* This appliance and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter.
- \* A minimum separation distance of 20 cm must be maintained between the antenna and the person for this appliance to satisfy the RF exposure requirements.

Note. 15.105(b)

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

# **ENDOSCOPE AUTO LEAK TESTER**

## **ELT-2000**

**Automatic Test Device for Detecting Leak in an Endoscope**

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**I n s t r u c t i o n   M a n u a l**

# Quality Assurance

## 1. Quality assurance

- The period of repair without charge is within one year after purchase, on the condition that the product is used normally, following the instruction manual.
- After the period of free repairing, repair will be charged.
- Problems occurred by user's mistakes will be charged for repair.

## 2. Repair without charge

Consumer damage type	Repairing contents
When problems are occurred within 10 days of normal use after purchase.	Refund / Exchange
When problems are occurred within one month of normal use after purchase.	Exchange / Repairing
When problems are occurred within one year of normal use after purchase.	Free repairing

## 3. Repairing at a cost

Types of consumer's damages	Repairing contents
<b>Even in the period of repair without charge, if the damages come from the following reasons, repair will be charged.</b> <ul style="list-style-type: none"><li>- Fire, Earthquake, Flood, Thunderbolt, Natural disaster, Environmental pollution</li><li>- Abnormal power supply, not the proprietary one (Voltage, Frequency)</li><li>- The cause of disorder is not related to this product.</li></ul>	<b>Repairing at a cost</b>

**The problems in operation are made by user's mistake or unreasonable repairing and remodeling.**

**Repairing at a cost**

**Please read manual carefully because expense will be charged if you request service to product in no trouble..**

**Charging expense**

#### **4. Customer counseling**

**- Phone number: +82-31-732-4602 ([www.endomaster.co.kr](http://www.endomaster.co.kr))**

## **Product warranty**

<b>Name of product</b>	Endoscope Auto Leak Tester
<b>Model name</b>	ELT-2000
<b>Number of product</b>	
<b>Date of purchase</b>	
<b>Seller [Name of Agent]</b>	
<b>Period of warranty</b>	1 year
<b>Name of customer</b>	
<b>Contact information of customer</b>	

