

MC-980MA Service Manual

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	Revision history	Date	Prepared	Approved
▲	Add Asian market version (P.XXXXX)	26/Jan/2011	Hatakeyama	Ono
▲				
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Approved	Reviewed	Prepared		株式会社 9=9
Ono	Saito	Hatakeyama	30/Sep/2010	

1. Mode

1.1 Adjustable items of each mode

MC-980 is operated by these three modes.

Normal mode	Usual mode	
Service mode	Service person only (Released by entering a service password	P.3)
Calibration mode	Service person only (Released by removing seal and switching.	P.3)

Adjustable items of each mode

	Normal	Service	Calibration
Date and Time	X	X	
Printer	X		
PC Connection	X		
External Device	X		
Measurement mode	X		
Controller	X	X	X
System		X	X
Scale		X	X
Span Adjustment			X
Gravity Correct			X
Count Mode		X	X
Scale Mode	X	X	X
Version information		X	X
Impedance		X	X
History		X	X
Initialization		X	X

Page		
P.4	Date and Time	Set date and time
Instruction	Printer	Select printer, Set printer operation
Instruction	PC Connection	Select Baud rate, Flow control
Instruction	External Device	Set barcode reader etc.
Instruction	Measurement Mode	Result Number Athletic selection, Target setting
P.21	Controller	Brightness, Beep, monitor vibration
P.5	System	Regression(Asian / Global), 5V power supply (on / off)
P.6	Scale	
P.6	Set Span	Span adjustment
P.8	Gravity Correct	Gravity correction
P.9	Count Mode	Checking raw count value
P.10	Scale Mode	Measurement weight in Service / Calibration mode
P.11	Version information	Display internal software version number
P.12	Impedance	Display impedance data, Impedance adjustment
P.13	History	Latest adjusted date, Number of adjustment etc
P.14	Initialization	Reset to factory default

1.2 Service mode



1. Press "Setup"



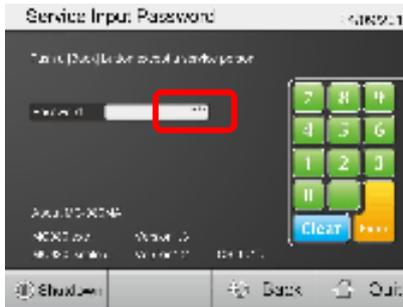
2. Input "9999" and "Enter"



3. Select "Various Setting"



4. Press enclosed "hidden button"



5. Input password "1944" and "Enter"



6. Select maintenance menu

Reference <Other password for special mode>

Input "1944 " Service mode

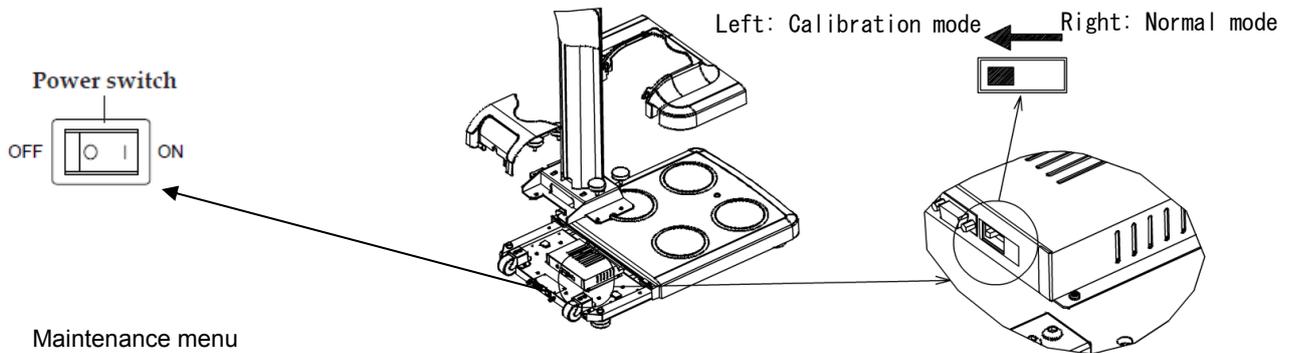
Input "980 " Display raw impedance data

Input "2127 " Set On / Off 5V power supply via RS232C cable

1.3 Calibration mode

1. Removing seal and switching the switch.
2. Turn on the power.
3. Select maintenance menu

Note: For span adjustment or gravity correcting, the seal must be removed.



Maintenance menu

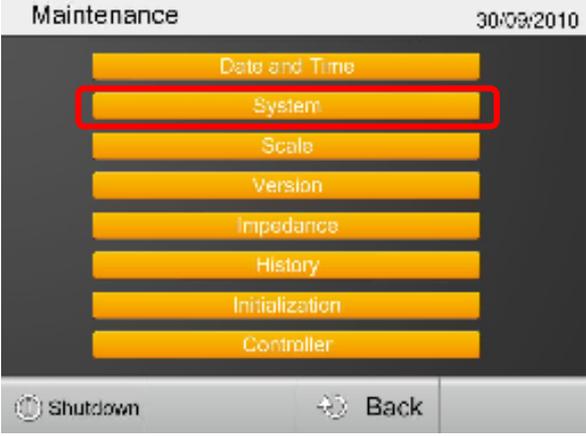
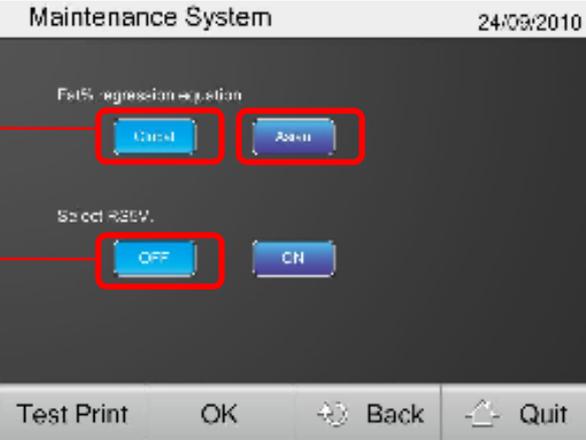


2. Various setting

2.1 Date and Time

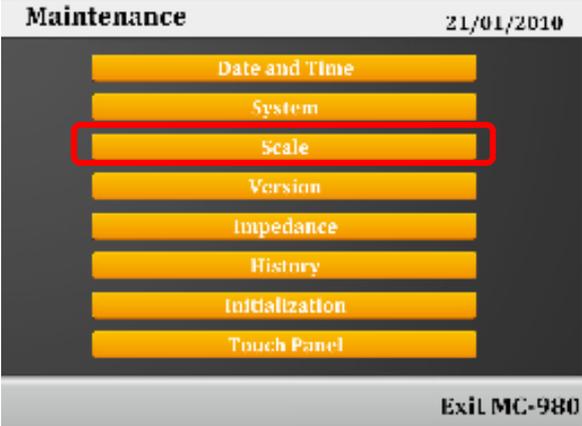
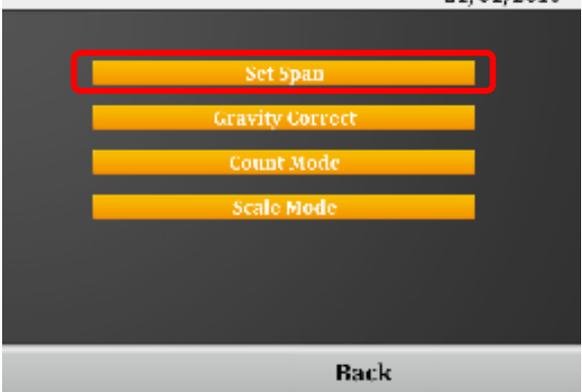
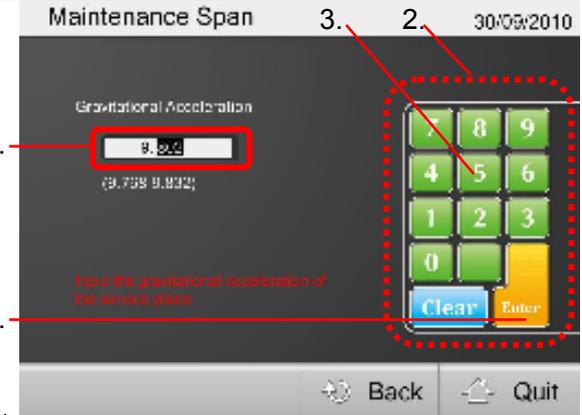
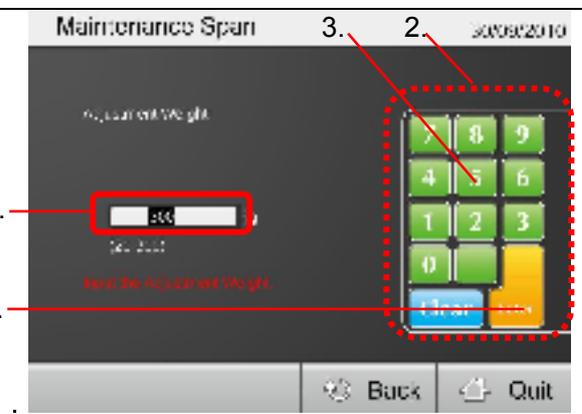
	DISPLAY	Operation
Maintenance		Select "Date and Time"
Date and Time		<p>Input date and time</p> <ol style="list-style-type: none"> 1. "dd/mm/yyyy" format 2. hh:mm" format 3. after inputting, press "Enter" <p>Note: "Enter" Save input value "Back" Return without saving</p>

2.2 System setting

	DISPLAY	Operation				
Maintenance		Select "System"				
Maintenance System		<ol style="list-style-type: none"> Select regression formula "Global" from India, Pakistan and to the East "Asian" from India, Pakistan and to the East Set On / Off 5V power supply via RS232C cable Note: Fix to "OFF" after inputting, press "OK" <p>Note:</p> <table border="0"> <tr> <td>"OK"</td> <td>Save input value</td> </tr> <tr> <td>"Back" "Quit"</td> <td>Return without saving</td> </tr> </table>	"OK"	Save input value	"Back" "Quit"	Return without saving
"OK"	Save input value					
"Back" "Quit"	Return without saving					

2.3 Scale setting

2.3.1. Span adjustment

	DISPLAY	Operation
Maintenance		Select "Scale"
Maintenance Scale		Select "Set Span"
Maintenance Span		Input gravitational acceleration 1. Select <input type="text" value="9.802"/> 2. Ten key appears.. 3. Input gravitational acceleration of adjusting area. $9.768 \leq \text{value} \leq 9.832$ 4. After inputting, press "Enter" Note Netherlands $gz = 9,813 \text{ m/s}^2$ Akita $gz = 9,802 \text{ m/s}^2$
Maintenance Span		Input adjustment load value 1. Select <input type="text" value="300"/> 2. Ten key appears.. 3. Input adjustment load value $20 \leq \text{value} \leq 300 \text{ kg}$ 4. After inputting, press "Enter"

Maintenance Span



Scale get zero point

The following message appears
"Now detecting zero point.
Please wait"

After getting zero point, the following message appears
"Carry load.
Press OK after it stabilized"



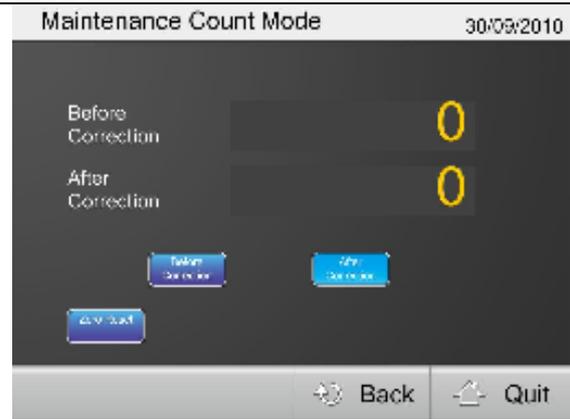
1. Put the adjustment load weight

2. After stabilizing, press "OK"

3. Take a load off the scale

Note:

"OK"	Save span adjustment
"Back" "Quit"	Return without saving



Raw count value are displayed

Put the weight, and confirm whether scale is normally adjusted.

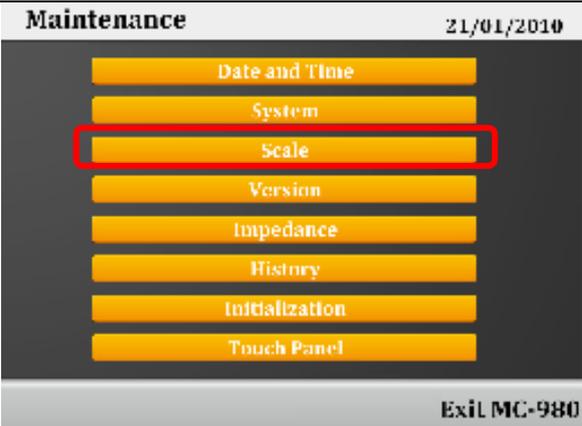
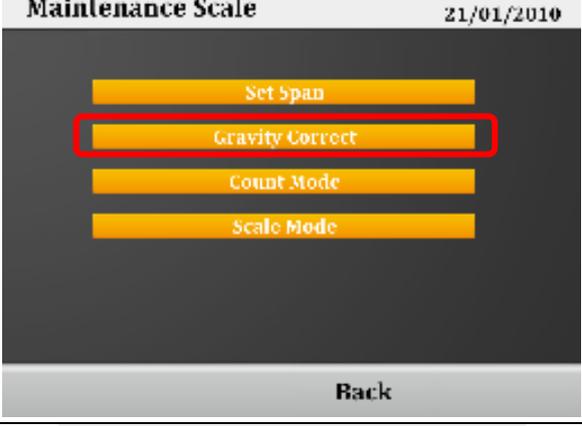
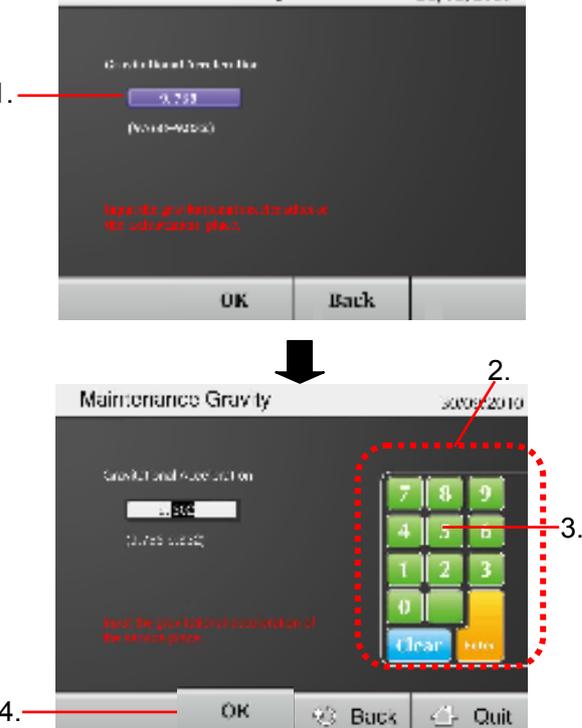
Acceptable tolerance

$0 \leq m \leq 500$	0.5m (10cts)
$500 < m \leq 2000$	1.0m (20cts)
$2000 < m \leq 10000$	1.5m (30cts)

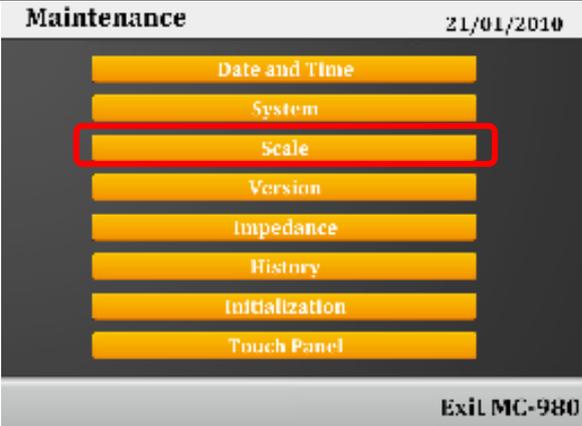
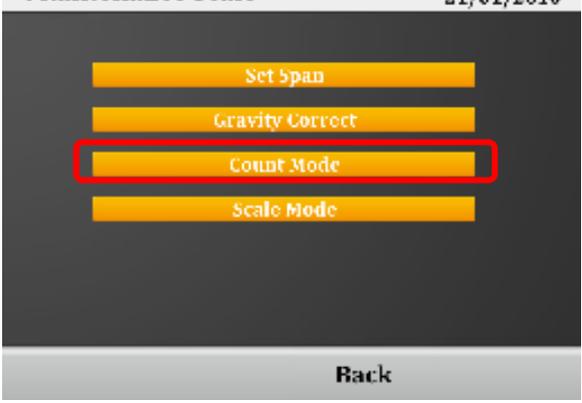
MC-980

1e = 0.1kg 20cts
Max = 300kg 60000cts

2.3.2. Gravity Correct

	DISPLAY	Operation				
Maintenance	 <p>Maintenance 21/01/2010</p> <p>Date and Time</p> <p>System</p> <p>Scale</p> <p>Version</p> <p>Impedance</p> <p>History</p> <p>Initialization</p> <p>Touch Panel</p> <p>ExiL MC-980</p>	Select "Scale"				
Maintenance Scale	 <p>Maintenance Scale 21/01/2010</p> <p>Set Span</p> <p>Gravity Correct</p> <p>Count Mode</p> <p>Scale Mode</p> <p>Back</p>	Select "Gravity Correct"				
Maintenance Gravity	 <p>Maintenance Gravity 21/01/2010</p> <p>Gravitational acceleration</p> <p>9.791</p> <p>(Unit: m/s²)</p> <p>Read the gravitational acceleration of the address area.</p> <p>OK Back</p> <p>Maintenance Gravity 2009/2010</p> <p>Gravitational acceleration</p> <p>9.802</p> <p>(Unit: m/s²)</p> <p>Read the gravitational acceleration of the address area.</p> <p>7 8 9</p> <p>4 5 6</p> <p>1 2 3</p> <p>0</p> <p>Clear enter</p> <p>4. OK Back Quit</p>	<ol style="list-style-type: none"> 1. Select <input type="text" value="9.802"/> 2. Ten key appears.. 3. Input gravitational acceleration of user's area. $9.768 \leq \text{value} \leq 9.832$ <p style="text-align: center;">Refer to the document of the gravity zone.</p> <ol style="list-style-type: none"> 4. After inputting, press "OK" <p>Note:</p> <table border="0"> <tr> <td>"OK"</td> <td>Save gravity correction</td> </tr> <tr> <td>"Back" "Quit"</td> <td>Return without saving</td> </tr> </table>	"OK"	Save gravity correction	"Back" "Quit"	Return without saving
"OK"	Save gravity correction					
"Back" "Quit"	Return without saving					

2.3.3. Count Mode

	DISPLAY	Operation
Maintenance		Select "Scale"
Maintenance Scale		Select "Count Mode"
Maintenance Count Mode		Raw count value are displayed

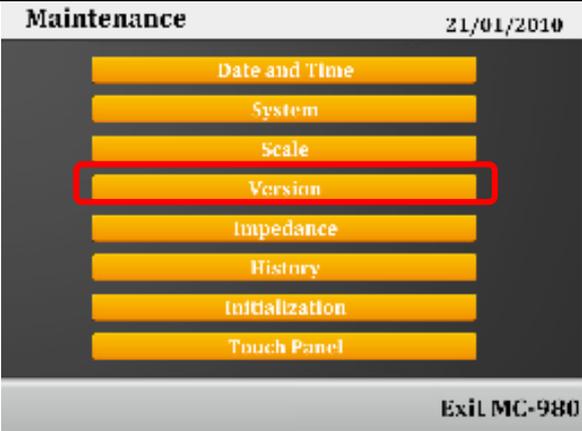
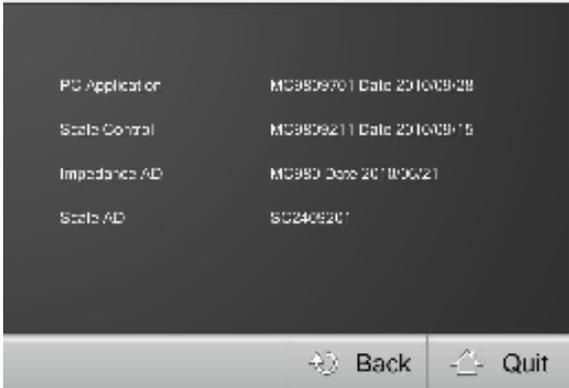
2.3.4. Scale Mode

Measurement weight in Service / Calibration mode

	DISPLAY	Operation
Maintenance		Select "Scale"
Maintenance Scale		Select "Scale Mode"
Weight		Measurement weight

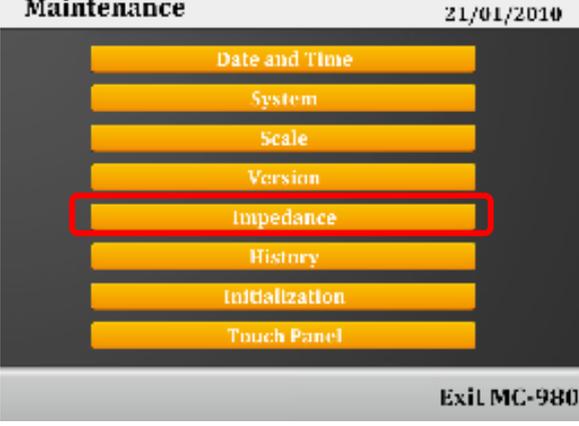
2.4 Version information

Display internal software version number

	DISPLAY	Operation
Maintenance		Select "Version"
Maintenance Version		Internal software version numbers are displayed

2.5 Impedance adjustment

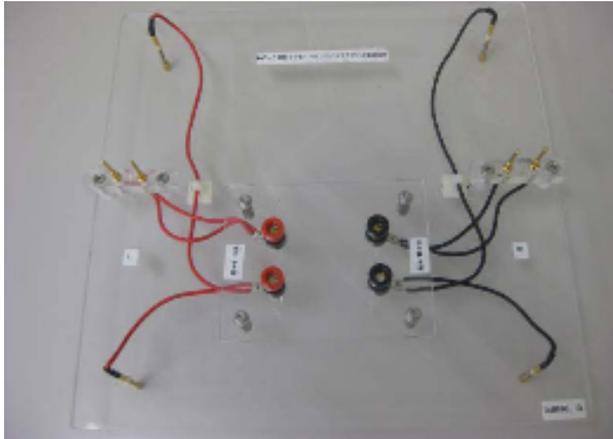
2.5.1. Check impedance

	DISPLAY	Operation
Maintenance	 <p>Maintenance 21/01/2010</p> <ul style="list-style-type: none"> Date and Time System Scale Version Impedance History Initialization Touch Panel <p>ExiL MC-980</p>	Select "Impedance"
Maintenance Impedance	 <p>Maintenance Impedance 30/03/2010</p> <ul style="list-style-type: none"> Impedance Display Impedance Adjustment <p>Back Quit</p>	Select "Impedance Display"
Impedance Display	 <p>Impedance Display 30/03/2010</p> <p>Frequency 50kHz</p> <p>① 1kHz 5kHz 50kHz 250kHz 500kHz 1000kHz</p> <p>Port Left Body</p> <p>② Parallel Impedance Left Imp Right Imp Right Imp</p> <p>③ / 800.2Ω Phase 0.0° R 800.3Ω X -0.1Ω</p> <p>Back Quit</p>	<ol style="list-style-type: none"> 1. Select measurement frequency 2. Select measurement segmental part 3. Measurement impedance Raw impedance value are displayed

2.5.2. Impedance adjustment

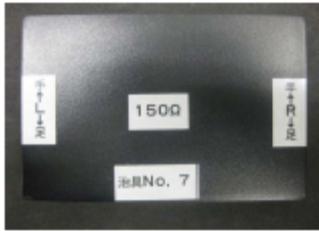
(1) Impedance adjuster and standard resistor

(Impedance adjuster and standard resistor are same as MC-180)



- | | | |
|-----|--------------------|--------------------|
| 1. | Impedance adjuster | |
| 2. | Resistor 150Ω | for check |
| 3. | Resistor 200Ω | for adjust |
| 4. | Resistor 400Ω | for check |
| 5. | Resistor 600Ω | for adjust |
| 6. | Resistor 800Ω | for check & adjust |
| 7. | Resistor 1200Ω | for adjust |
| 8. | Resistor 1500Ω | for check |
| 9. | Low impedance | for check |
| 10. | Middle impedance | for check |
| 11. | High impedance | for check |

1. Impedance adjuster



2. Resistor 150Ω



3. Resistor 200Ω



4. Resistor 400Ω



5. Resistor 600Ω



6. Resistor 800Ω



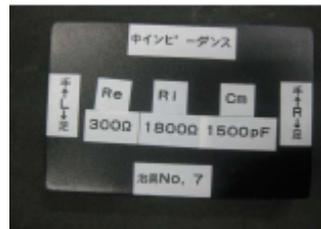
7. Resistor 1200Ω



8. Resistor 1500Ω



9. Low impedance



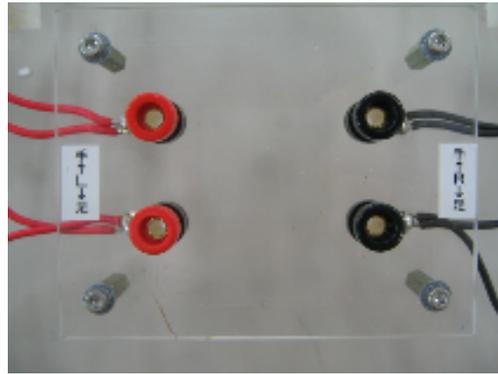
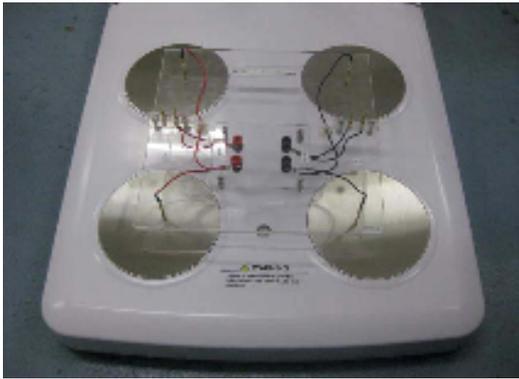
10. Middle impedance



11. High impedance

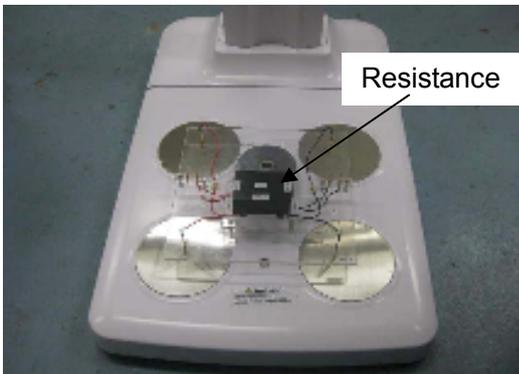
(2) Impedance adjustment

1. Put impedance adjuster on top of the scale.



Note: The contact points of adjuster (4 contact points) must be attached on each electrode. The electrode is easily scratched. Take care about handling. The impedance adjuster is necessary to put to the right and left correctly.

2. Set standard resistor and 500g weight on the impedance adjuster.



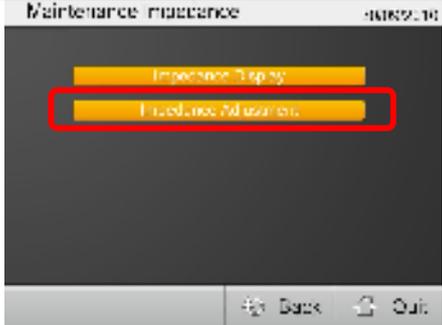
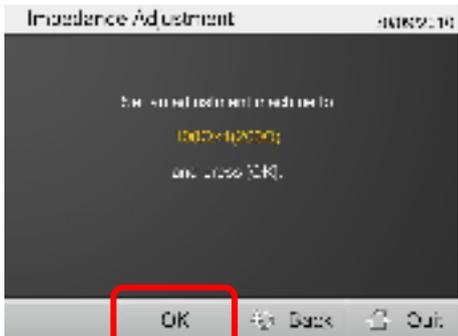
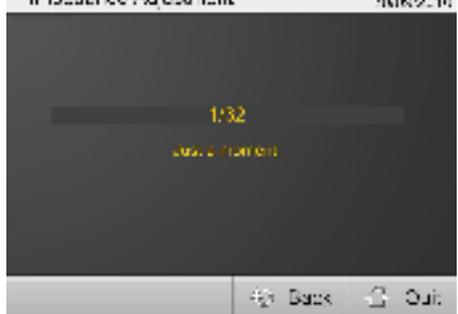
Note: Match the L R position of the impedance adjuster and resistor correctly. Put the 500g weight on the adjuster for sturdy touch between contact points and electrode. The standard resistor to use impedance adjustment is 200Ω, 600Ω, 800Ω and 1200Ω.

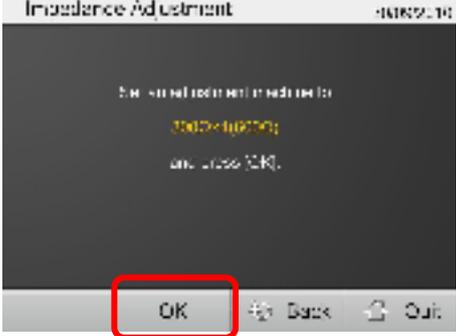
3. Set the Hand grips on the impedance adjuster.



Note: Open the rubber cover, and insert two connector contacts. The hand grips direction like photograph.

(3) Adjusting Impedance

	DISPLAY	Operation
Maintenance		Select "Impedance"
Maintenance Impedance		Select "Impedance adjustment"
Impedance Adjustment		<p>1. Set the 200Ω resistance after this screen appears</p>  <p style="text-align: right;">200Ω</p> 
Impedance Adjustment		<p>2. After setting resistance, press "OK"</p> <p>The adjustment is executed this message appears "Just a moment"</p> <p>The progress indicator of 200Ω 1/32 – 7/32</p> <p>After the 200Ω adjustment is completed, the adjustment process will go to the next step</p>

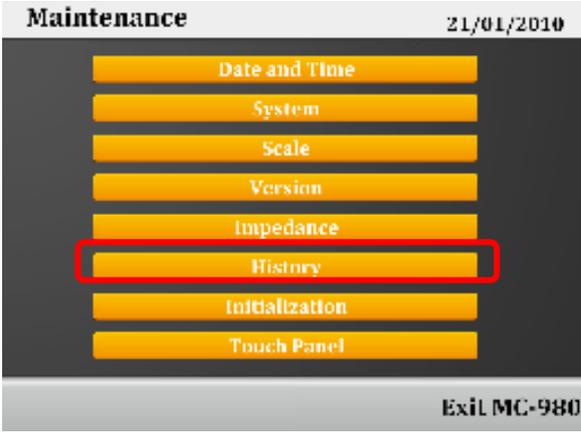
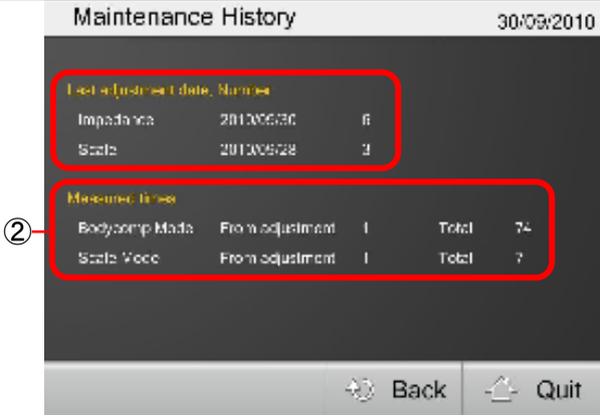
DISPLAY	Operation
	<p>1. Set the 600Ω resistance after this screen appears</p>  <p>2. After setting resistance, press “OK”</p> <p>The adjustment is executed this message appears “Just a moment”</p> <p>The progress indicator of 600Ω 8/32 – 16/32</p> <p>After the 600Ω adjustment is completed, the adjustment process will go to the next step</p>
	<p>1. Set the 1200Ω resistance</p>  <p>2. After setting resistance, press “OK”</p> <p>The progress indicator of 1200Ω 17/32 – 24/32</p> <p>After the 1200Ω adjustment is completed, the adjustment process will go to the next step</p>
	<p>1. Set the 800Ω resistance after this screen appears</p>  <p>2. After setting resistance, press “OK”</p> <p>The progress indicator of 800Ω 25/32 – 32/32</p> <p>After the 800Ω adjustment is completed, the adjustment process will go to the next step</p>
	<p>Row impedance value are displayed</p> <p>Confirm the impedance value</p>

(4) Tolerance

Impedance							Reactance Resistance					
Segment	Freq.		Resistance of standard				Low	Middle	High			
			150Ω	400Ω	800Ω	1500Ω	Re: 150Ω	Re: 300Ω	Re: 750Ω			
							Ri: 750Ω	Ri: 1800Ω	Ri: 2700Ω			
						Cm: 2700pF	Cm: 1500pF	Cm: 1000pF				
Segment	Freq.		Tolerance				Segment	Freq.		Tolerance		
H-L	1kHz	Z	±2%	±2%	±2%	±2%	H-L	1kHz	R, X	±8Ω	±15Ω	±30Ω
	5kHz	Z	±2%	±2%	±2%	±2%		5kHz	R, X	±8Ω	±15Ω	±30Ω
	50kHz	Z	±2%	±1%	±1%	±2%		50kHz	R, X	±8Ω	±15Ω	±30Ω
	250kHz	Z	±2%	±2%	±2%	±2%		250kHz	R, X	±8Ω	±15Ω	±30Ω
	500kHz	Z	±3%	±3%	±3%	±3%		500kHz	R, X	±8Ω	±15Ω	±60Ω
	1000kHz	Z	±10%	±10%	±10%	reference		1000kHz	R, X	±16Ω	±30Ω	reference
RL	1kHz		±2%	±2%	±2%	±2%	RL	1kHz	R, X	±8Ω	±15Ω	±30Ω
	5kHz	Z	±2%	±2%	±2%	±2%		5kHz	R, X	±8Ω	±15Ω	±30Ω
	50kHz	Z	±2%	±1%	±1%	±2%		50kHz	R, X	±8Ω	±15Ω	±30Ω
	250kHz	Z	±2%	±2%	±2%	±2%		250kHz	R, X	±8Ω	±15Ω	±30Ω
	500kHz	Z	±3%	±3%	±3%	±3%		500kHz	R, X	±8Ω	±15Ω	±60Ω
	1000kHz	Z	±10%	±10%	±10%	reference		1000kHz	R, X	±16Ω	±30Ω	reference
LL	1kHz	Z	±2%	±2%	±2%	±2%	LL	1kHz	R, X	±8Ω	±15Ω	±30Ω
	5kHz	Z	±2%	±2%	±2%	±2%		5kHz	R, X	±8Ω	±15Ω	±30Ω
	50kHz	Z	±2%	±1%	±1%	±2%		50kHz	R, X	±8Ω	±15Ω	±30Ω
	250kHz	Z	±2%	±2%	±2%	±2%		250kHz	R, X	±8Ω	±15Ω	±30Ω
	500kHz	Z	±3%	±3%	±3%	±3%		500kHz	R, X	±8Ω	±15Ω	±60Ω
	1000kHz	Z	±10%	±10%	±10%	reference		1000kHz	R, X	±16Ω	±30Ω	reference
RH	1kHz	Z	±2%	±2%	±2%	±2%	RH	1kHz	R, X	±8Ω	±15Ω	±30Ω
	5kHz	Z	±2%	±2%	±2%	±2%		5kHz	R, X	±8Ω	±15Ω	±30Ω
	50kHz		±2%	±1%	±1%	±2%		50kHz	R, X	±8Ω	±15Ω	±30Ω
	250kHz	Z	±2%	±2%	±2%	±2%		250kHz	R, X	±8Ω	±15Ω	±30Ω
	500kHz	Z	±3%	±3%	±3%	±3%		500kHz	R, X	±8Ω	±15Ω	±60Ω
	1000kHz	Z	±10%	±10%	±10%	reference		1000kHz	R, X	±16Ω	±30Ω	reference
LH	1kHz	Z	±2%	±2%	±2%	±2%	LH	1kHz	R, X	±8Ω	±15Ω	±30Ω
	5kHz	Z	±2%	±2%	±2%	±2%		5kHz	R, X	±8Ω	±15Ω	±30Ω
	50kHz	Z	±2%	±1%	±1%	±2%		50kHz	R, X	±8Ω	±15Ω	±30Ω
	250kHz		±2%	±2%	±2%	±2%		250kHz	R, X	±8Ω	±15Ω	±30Ω
	500kHz	Z	±3%	±3%	±3%	±3%		500kHz	R, X	±8Ω	±15Ω	±60Ω
	1000kHz	Z	±10%	±10%	±10%	reference		1000kHz	R, X	±16Ω	±30Ω	reference
L-L	1kHz	Z	±2%	±2%	±2%	±2%	L-L	1kHz	R, X	±8Ω	±15Ω	±30Ω
	5kHz	Z	±2%	±2%	±2%	±2%		5kHz	R, X	±8Ω	±15Ω	±30Ω
	50kHz	Z	±2%	±1%	±1%	±2%		50kHz	R, X	±8Ω	±15Ω	±30Ω
	250kHz	Z	±2%	±2%	±2%	±2%		250kHz	R, X	±8Ω	±15Ω	±30Ω
	500kHz	Z	±3%	±3%	±3%	±3%		500kHz	R, X	±8Ω	±15Ω	±60Ω
	1000kHz	Z	±10%	±10%	±10%	reference		1000kHz	R, X	±16Ω	±30Ω	reference

Z: Impedance R: Resistance X: Reactance

2.6 History

	DISPLAY	Operation																								
Maintenance		Select "History"																								
Maintenance History	 <table border="1" data-bbox="247 779 595 875"> <thead> <tr> <th colspan="4">Last adjustment date, Name</th> </tr> </thead> <tbody> <tr> <td>Impedance</td> <td>2013/05/30</td> <td>6</td> <td></td> </tr> <tr> <td>Scale</td> <td>2013/05/28</td> <td>2</td> <td></td> </tr> </tbody> </table> <table border="1" data-bbox="247 887 748 983"> <thead> <tr> <th colspan="4">Measured times</th> </tr> </thead> <tbody> <tr> <td>Bodycomp Made</td> <td>From adjustment</td> <td>1</td> <td>Total 74</td> </tr> <tr> <td>Scale Weigh</td> <td>From adjustment</td> <td>1</td> <td>Total 7</td> </tr> </tbody> </table>	Last adjustment date, Name				Impedance	2013/05/30	6		Scale	2013/05/28	2		Measured times				Bodycomp Made	From adjustment	1	Total 74	Scale Weigh	From adjustment	1	Total 7	<p>The number of measured times is displayed</p> <p>The latest adjustment day / number of adjustment</p> <p>The number of measured times since the latest adjustment day. / initial day</p>
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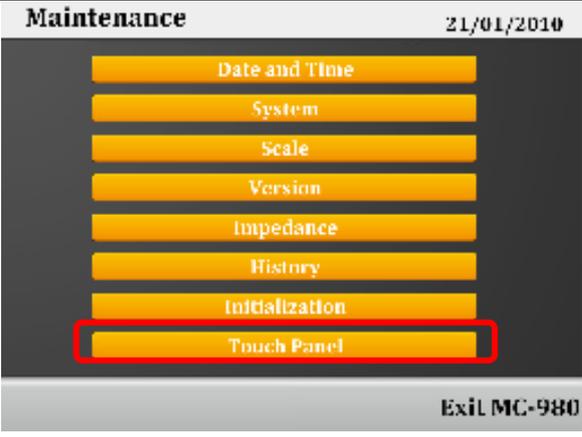
Initial value

The difference between EU and ASIA is only Fat% regression formula.

Select Type	
	

Service mode	System	Fat% regression formula	Asian	Global
		Select RS5V	OFF	
Setting mode	Print	Set Printer Operation	ON	
		Auto Print	OFF	
		Paper	Pre Printed form	
		Adjust Printing Postion	Right:[0.0]mm, Left:[0.0]mm	
	PC Connection	Baud Rate	9600	
		Flow Control	Hardware	
	Optional Device	Input Device	OFF	
		Card Reader length	13	
	Measurement Mode	ID	OFF	
		Athletic Selection	ON	
		BF % Target Setting	ON	
	Controller	Brightness	5	
		Beep	ON	
		Vibration Mode	ON	

2.8 Controller settings

DISPLAY		Operation
Maintenance		Select "Controller"
Controller		<p>Select setting items</p> <p>Initial value</p> <p>Brightness 5</p> <p>Beep ON</p> <p>Vibration mode ON</p>

3. Troubleshooting

Failure case	Check points	Repairing method
Any screen is not displayed though it turns on the main power.	Check the power supply cord connection of the main unit and the control unit	Check the cable again
	Check the power cable connection of the power source and each PCB	Check the cable again
	Check whether the power is supplied from the power source to control unit	If not supplied Change the power source If supplied Change the control unit
	Check the communication cable connection of the main PCB and the control unit	Check the cable again
	If there is no improvement by each method	Exchange the main PCB
Measurements are inaccurate Even if a standard resistance is measured, the measurements value are unstable. Measurements are too large / too small.	Check the hand grip electrode / foot electrode cable connection	Check the cable again.
	Calibrate impedance by standard resistor 200Ω, 600Ω and 1200Ω. Measure impedance with a standard resistor 400Ω, 800Ω and 1500Ω, and confirm measurements are in the tolerance.	if it is out of the tolerance Change the impedance PCB
	Check whether the microcomputer on the impedance PCB works with the latest version software.	if it is not the latest version Update the software
Error message are displayed "Communication error" after turning on the power of the main unit.	Check the writable mode switch of the microcomputer on the main PCB	if it is set writable mode Switch it to un-writable
	Check the writable mode switch of the microcomputer on the impedance PCB	if it is set writable mode Switch it to un-writable
	Check the solder position of an analog PCB.	Correct the soldering position
Error message are displayed Though the date and time has been set, the date setting is demanded many times.	Check whether the lithium battery is correctly set.	Set the lithium battery
	If there is no improvement by each method	Exchange the main PCB