

STU & SMART MCCB TESTER

USER MANUAL INSTRUCTION

Contents

USER MANUAL

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1. Waring

Thoroughly read user manual before usage for safe Use and to fully understand features of OCR TESTER. Please keep user manual near the OCR TESTER.

Symbols used on product and in user manual represents following warnings:

	Warning	Appears when instruction are violated, and there is possibility of serious injury or death.
	Caution	Appears when instruction are violated, and there is possibility of minor injury or product damage.

	Appears under certain condition where there is risk of danger and user should pay attention.
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Waring

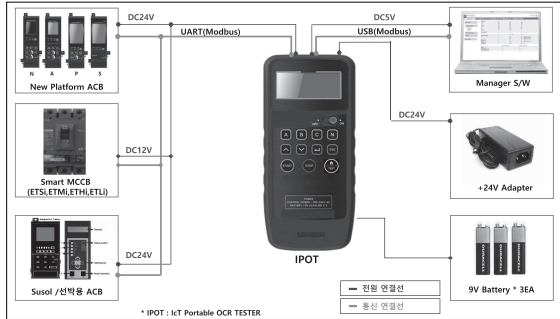
- Do not operate, check or install alone.
- Do not carry out a test when ACB or MCCB is powered or while operating.
 - it may cause electric shock or malfunction of ACB or MCCB
- Do not carry out a test if the bus is in live-wire state.
 - it may cause electric shock and the charging voltage of current transformer may be damaged or cause fire.
- Do not carry out a test when ACB or MCCB control is powered.
 - it may cause electric shock or malfunction of ACB or MCCB.
- Do not disassemble the product even when unpowered.
 - internal charging current of the product may cause electric shock.
- Do not install or operate with wet hands. It may cause electric shock.
- Do not use if the sheath of cable is damaged.
 - it may cause electric shock.
- Please wear necessary protection for usage.
- Please attach safety caution before operating.

Caution

- Precaution for installation and terminal wiring.
 - Please apply correct power which suits rating of power terminal.
 - violation of this caution may cause product damage or fire.
 - Do not allow screws or other metal materials, water, oil or other substances enter inside the product.
 - violation of this caution may cause product damage or fire.
 - Please check the direction before connecting the connector to terminal input/output.
 - violation of this caution may cause product damage or fire.
 - Please use the offered adapter.
 - violation of this caution may cause product damage or fire.
- Checklist before inserting power.
 - Check voltage and polarity of control power.
 - Check cable direction of tester and device.
 - Please change the battery if product fails to operate without additional power supply.
- Precautions for storage and handling.
 - Please store in area where there is no moisture or dust.
 - Do not throw or add strong force when moving.
- Precautions for disposal.
 - When disposing, treat it as industrial waste disposal.

2. Product Feature

- Calibration : OCR TESTER's calibration function corrects the generated error using the output value set in TESTER and current data of device, and updates the correction coefficient.
- Device H/W Setting: It consists of setting the H / W value and time of the device and setting the language and time of the OCR TESTER itself.
- Relay Setting: It consists of checking the current relay of the device and setting the relay.
- Relay Test: It is composed of MANUAL/ AUTO / USER TEST to perform various relay test.
- Control: It provides the function of clearing or resetting the data of the device and controlling the DO and CB.
- System Information: It consists of a part that displays the system information of the device, the relay status, and the system information of the **OCR TESTER**.
- Test History: It consists of a part to check the test history stored in the OCR TESTER and a part to delete the stored history information.



3. Product Components



Num.	Contents	Feature
①	OCR TESTER	IPOT(ICT Potable OCR TESTER) Product
②	Adapter	AC100~240V, DC24V, 2.5A Adapter
③	Power Cable	Power Cable for Adapter
④	Socket	Power Compatible Socket(Only Overseas)
⑤	Signal Cable #1	Signal Cable for STU/SMART MCCB TESTER (Black molded cable)
⑥	Signal Cable #2	Signal Cable for existing OCR (Gray flat cable)
⑦	USB Cable	USB Cable(Mini-B)
⑧	Manual(Korean)	Korea Manual for User
⑨	Manual(English)	English Manual for User
⑩	Bag	Bag for Product and Components
⑪	Box	Product Box

4. Product Appearance & Configuration



Num.	Contents	Feature
①	Power Switch	Power ON/OFF Switch
②	LCD	256 x 128 Graphic LCD
③	KEY PAD	Buttons for Menu Navigation, Setup and Operation
④	Adapter Terminal	DC24V Adapter Terminal
⑤	USB Terminal	USB communication connector with PC (USB2.0)
⑥	Signal Port	Device Testing Port
⑦	Battery	9V Alkaline Battery(x 3ea)

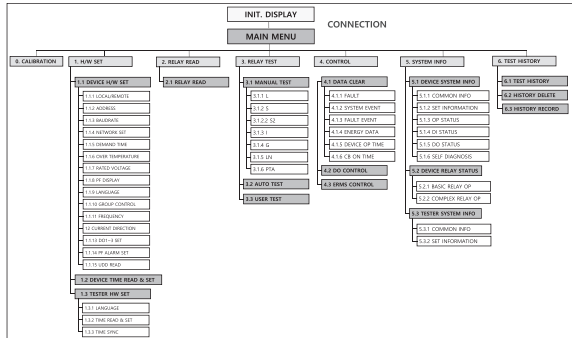
4. Product Appearance & Configuration



Num.	Button	Function
1	A	Phase A selected Button
2	B	Phase B selected Button
3	C	Phase C selected Button
4	N	Phase N selected Button
5	↑	"INCREASE" Button
6	↓	"DECREASE" Button
7	↵	"ENTER" Button
8	ESC	"ESC" Button
9	START	"START" Button for generating waveform
10	STOP	"STOP" Button for stopping waveform
11	TEST	HOME/TEST Switch Button

5. LCD Display

The configuration of the LCD consists of seven large items from calibration (0,CALIBRATION) to the test history (6,TEST HISTORY).

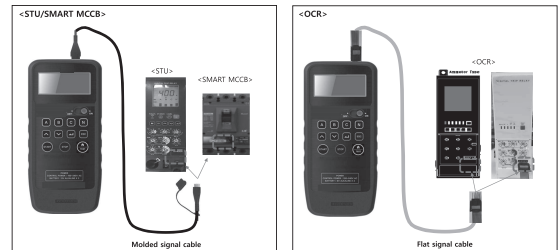


MENU	Description
0.CALIBRATION	0. TESTER CALIBRATION Calibration of TESTER
1.H/W SET	1.1 DEVICE H/W SET Set hardware information of the device 1.2 DEVICE TIME READ&SET Read and reset the time set on the device 1.3 TESTER H/W SET Read and set the display language and time of IPOT
2.RELAY READ & SET	2.1 RELAY READ Check the current relay information of the device 2.2 RELAY SET Set the current relay information of the device The relay other than the selected relay element is tested in NOT USE state
3.RELAY TEST	3.1 MANUAL TEST Test only relay elements set to 'USE' among current relay information 3.2 AUTO TEST Test the current relay element with the relay set 3.3 USER TEST Test the current relay element with the relay set
4.CONTROL	4.1 DATA CLEAR FAULT and EVENT clear function of device 4.2 DO CONTROL DO and CB control function 4.3 ERMS CONTROL ERMS control function
5.SYSTEM INFORMATION	5.1 DEVICE SYSTEM INFO Check device common, setting, DI/DO information and self-diagnosis status information 5.2 DEVICE RELAY STATUS Check the basis and complex relay status. 5.3 TESTER SYSTEM INFO Check the IPOT common and self-diagnosis status You can check the history of the relay test result and generate the test result report using the top Manage S/W
6.TEST HISTORY	6.1 TEST HISTORY Function to clear the list of relay test results. 6.2 TEST HISTORY DEL Function to clear the list of relay test results. 6.3 HISTORY RECORD The ability to output relay test results.

6. Device Connection

Connect the signal cable to the signal output terminal on the top of the OCR TESTER, then connect the other signal cable to the OCR.

– OCR TESTER can be used by connecting both existed ACB and ACB or MCCB. However, please refer to below picture for connecting cable.



Note1) STU/SMART MCCB

- Connect the **STU** and TESTER using the supplied **MOLDED SIGNAL CABLE**.
- After connecting the OCR and TESTER, turn on the power of TESTER and press any button to connect the OCR automatically.
- When the test is completed, press STOP button for about 3 seconds to stop control power generation of OCR. After that, turn off the power switch of TESTER.

Note2) Existing OCR

- Connect the OCR, TESTER, and the supplied **FLAT SIGNAL CABLE** to the unit.
- How to use after this is the same as above.

"If control power is required, proceed in the same way as above with control power applied."

7. Product Rating

7-1. Standard Usage Environment

Unless there was a special condition mentioned, please follow the standard conditions below,

- Temperature
 - Standard using temperature : -10℃ ~ 55℃
 - Storage temperature : -25℃ ~ 70℃
- Humidity : Then Humidity should be less than 80% where there's no dew anytime.
- Using environment condition
 - Altitude : below 2,000m.
 - Area where there is no abnormal vibration or shock.
 - The surrounding air should be clean.

7-2. Product Input Rating

Classification	Applied Limits	Note
Rated Frequency	60Hz or 50Hz	
Rated Voltage	AC100 ~ 240V	SMPS
BATTERY	DC9V Alkaline Battery	3ea
Power Consumption	Under 10W	

7-3. Product Certification

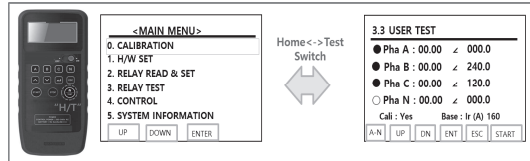
- Product Name: OCR TESTER
- Model Name : IPOT
- Certification Number : R-R-LSR-IPOT



8. Operation Method

8-1. Operation Method

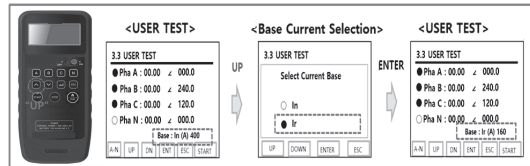
The device test is a simple test method using the "H/T" button, which is the home & test switch button. The device test is performed by the user setting in the state of the relay element set in the <3.3 USER TEST> screen .



8-1-1. Base Current Selection

The base current is to select a reference current of the current to be output.

- The example below is an example of changing the reference current from the Ir reference to the In reference.
- In the user relay test screen of the figure, press the "UP" button to switch to <Base current selection> screen. Select "In" by using "UP / DOWN" button in < Base current selection > screen and input "ENTER".
- In the user test screen, you can check the changed Ir value (Base: In (A)_400 -> Base: Ir (A) 160)

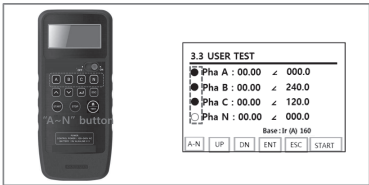


Similarly, the same method can be used to change the reference current from In to Ir (Ir, In in the figure depends on the set value of each device).

8. Operation Method

8-1. Operation Method

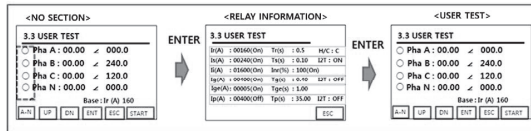
8-1-2. Output Amplitude Setting



- To select the output amplitude and phase, first use "A ~ N" button to select the image to be output.
- In the user relay test, press the "A ~ N" button for each phase to show the activation / deactivation status.
 - : Active status, ○ : Inactive state
- Use the "A ~ N" button to select the output phase and press the "ENT" button to select the output size and phase
 - Only one Selection of the "A ~ N" buttons : Amplitude and phase Setting
 - Multiple Selection of the "A ~ N" buttons : Only Amplitude Setting
 - No Selection of the "A ~ N" buttons : Relay Information of Device

8-1-2-1. No Selection – Relay information of device

User Relay Test If there is **NO** selection of "A ~ N" buttons in <3.3 USER TEST>, you can check relay information set in the device.

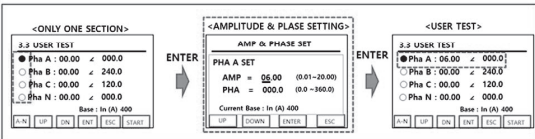


8. Operation Method

8-1. Operation Method

8-1-2-2. Only one selection– Amplitude & Phase

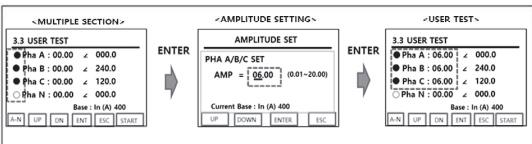
Output and phase setting screen In <AMP & PHASE SET> using "ENTER" button, you can select the value to output by using "UP / DOWN" button and set the value by moving BAR. After setting the last phase, press "ENTER" button. Press to switch to the user test screen <3.3 USER TEST> screen.



- AMP : 0.01 to 21.00 (MCCB : 0.01 ~ 17.00) in 0.01 unit
- PHA : 0.0 to 360.0 in 0.1 degree

8-1-2-3. Multiple selection– Only Amplitude

ex)The output value is set to 6 times by selecting the A, B, C phase using the "A ~ N" buttons. First, activate the A, B, C phase by using the "A ~ N" buttons in the user test screen <3.3 USER TEST> and press the "ENTER" button to switch to the screen to set the output amplitude. To set 6 times, set it to 06.00, move BAR to the second decimal place and press "ENTER" again to switch to user test screen.



- AMP : 0.01 to 21.00 (MCCB : 0.01 ~ 17.00) in 0.01 unit

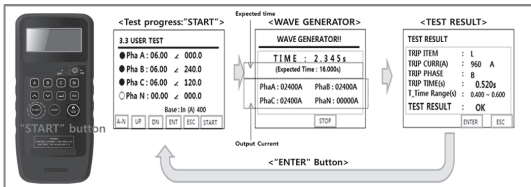
8. Operation Method

8-2. Relay Test

8-2-1. Relay Test

The device test is a simple test method using the "H / T" button, which is the home & test switch button. The device test is performed by the user setting in the state of the relay element set in the <3.3 USER TEST> screen .

ex) In : 400A, Base Current: In, Amp: Phase A, B, C is 6.00



- Press the "START" button on the user test screen (3.3 USER TEST) to perform the relay test. The output waveform screen (WAVE GENERATOR II) shows the running time, estimated operation time and output current value.
- The output current is indicated by the current(= magnitude * base current) (A). If the value is not displayed in the expected operation time, the current or relay setting that does not perform the relay operation is set to the "NOT USE" state and the relay is not operated.
- If you want to stop the test, press the "STOP" button to stop the test immediately.
- When TRIP occurs in the device, OCR TESTER displays the test result by switching the output value to the stop and test result screen (TEST RESULT).
- Pressing the "STOP" button on the TEST RESULT screen will reset the instrument relay operation status. If you press the "ENTER" button, you can switch to the user test screen (3.3 USER TEST). Press "ESC" button to switch to the menu test list screen.

8. Operation Method

8-2. Relay Test

8-2-2. Relay Test Result

The test results show the type of TRIP generation, generated current, phase, operating time, minimum / maximum time of occurrence and test result.

TEST RESULT (GROUP A)	
TRIP ITEM	: L
TRIP CURR(A)	: 960 A
TRIP PHASE	: B
TRIP TIME(s)	: 0.520s
T_Time Range(s)	: 0.400 ~ 0.600
TEST RESULT	: OK
ENTER ESC	

- TRIP ITEM : Long time(L), Short time(S1), Short time(S2), Instantaneous Time(I), inner Ground(G), Neutral Long time(LN), PTA
- TRIP CURR(A) : The largest value among the A to N phase currents applied in the test with trip current
- TRIP PHASE : A, B, C, N in trip phase, G represents Ground trip
- TRIP TIME(s): Relay operation time
- T_Time Range(s) : Trip time range of relay
- TEST RESULT : "OK" is displayed during the relay operation within the relay operation time range (T_Time Range). If the relay operation time range is exceeded, "FAIL" is displayed. Also, after waiting 10 seconds after the maximum operation time, Even if there is no operation, "FAIL" is displayed.

* The test results are stored in the memory of the OCR TESTER and can be reported to the test result in PDF using the PC Manager software.

9. Relay Element Testing Method

9-1.Long Time(3.3 USER TEST)

- Change ACB/MCCB Setting value.
 - Set other relay elements(Isd / li / lg) to OFF.
 - (When Test is performed with 3.2 MANUAL TEST/3.2.1 L, then relay element other than L relay element is automatically turned OFF in TESTER.)
- Change OCR TESTER Setting Value
 - refer to Standard Table for Long Time Relay before setting.
- Press "START" button.
- The expected time is displayed in the LCD window.
- Check whether the relay element is operating with the LCD window.
 - For details, refer to the ACB main unit operation manual.
- After completing the relay element test, press the "STOP" button to clear the OCR relay operation status.
- If you want to continue testing, press "ENTER" button to switch to the relay test screen (3.3 USER TEST).

Test table for Long Time Delay trip						
No.	Setting Condition				Standard Operation Time (Sec)	
	OCR knob			TESTER (Current Base: Ir) Output(A/B/C)		
	N/A Type		P/S Type			
	lu	lr	lr	tr		
1	0.5	0.8	0.4	0.5	2.0	4,214~6,322
2				0.5	6.0	0.4~0.6
3				20.0	6.0	16.0~24.0
4	1.0	1.0	1.0	0.5	2.0	4,214~6,322
5				0.5	6.0	0.4~0.6
6				20.0	6.0	16.0~24.0

9. Relay Element Testing Method

9-2.Short Time(3.3 USER TEST)

- Change ACB/MCCB Setting value.
 - Set other relay elements(Ir / li / lg) to OFF.
 - (When Test is performed with 3.2 MANUAL TEST/3.2.2 S, then relay element other than S relay element is automatically turned OFF in TESTER.)
- Change OCR TESTER Setting Value
 - refer to Standard Table for Short Time Relay before setting.
- Press "START" button.
- Repeat steps 9-1.(4) to (7).

Test table for Short Time Delay trip				Setting Condition			Standard Operation Time (Sec)
No.	OCR knob				TESTER (Current Base: Ir)		
	N/A Type		P/S Type	Output(A/B/C)			
	Iu	Ir	Ir		I _{sd}	t _{sd} (I ¹ *)	
1	0.5	0.8	0.4	1.5	0.1(off)	1.65	0.08~0.14
2	0.5	0.8	0.4	1.5	0.1(on)	1.65	2.938~4.407
3	0.5	0.8	0.4	1.5	0.4(off)	1.65	0.36~0.44
4	0.5	0.8	0.4	1.5	0.4(on)	1.65	11.753~17.630
5	1.0	1.0	1.0	10.0	0.1(off)	11.0	0.08~0.14
6	1.0	1.0	1.0	10.0	0.4(off)	11.0	0.36~0.44

9. Relay Element Testing Method

9-3.Instantaneous Time(3.3 USER TEST)

- Change ACB/MCCB Setting value.
 - Set other relay elements(Ir / Isd / li) to OFF.
 - (When Test is performed with 3.2 MANUAL TEST/3.2.3 I, then relay element other than I relay element is automatically turned OFF in TESTER.)
- Change OCR TESTER Setting Value
 - refer to Standard Table for Short Time Relay before setting.
- Press "START" button.
- Repeat steps 9-1.(4) to (7).

Test table for Instantaneous trip					Standard Operation Time (Sec)
No.	Setting Condition				
	OCR knob		TESTER (Current Base: In)		
	N/A Type	P/S Type			
	lu	lr	lr	li	Output(A/B/C)
1	In standard does not influence operating time with any value setting.			2	2.2
2				6	6.6
3				15	16.5

9. Relay Element Testing Method

9-4.Ground(3.3 USER TEST)

- Change ACB/MCCB Setting value.
 - Set other relay elements(Ir / Isd / li) to OFF.
 - (When Test is performed with 3.2 MANUAL TEST/3.2.4 G, then relay element other than G relay element is automatically turned OFF in TESTER.)
- Change OCR TESTER Setting Value
 - refer to Standard Table for Ground Relay before setting.
- Press "START" button.
- Repeat steps 9-1.(4) to (7).
- The ground trip test applies current only to one of the A / B / C / N phases.

Test table for Ground Fault trip				Setting Condition			Standard Operation Time (Sec)
No.	OCR knob		TESTER (Current Base: In)				
	N/A Type Iu	P/S Type Ir	Ig	tg(I ¹ t)	Output(A/B/C)		
1	In standard does not influence operating time with any value setting.		0.2	0.05(off)	0.24	0.02~0.08	
2				0.1(off)	0.24	0.08~0.14	
3				0.4(off)	0.24	0.36~0.44	
4			1.0		0.05(off)	1.1	0.02~0.08
5					0.1(off)	1.1	0.08~0.14
6					0.4(off)	1.1	0.36~0.44

9. Relay Element Testing Method

9-5.PTA(for Marine)

- Change ACB for marine Setting value.
 - Set other relay elements(Ir / Isd / li / lg) to OFF.
 - (When Test is performed with 3.2 MANUAL TEST/3.2.6 PTA, then relay element other than PTA relay element is automatically turned OFF in TESTER.)
- Change OCR TESTER Setting Value
 - refer to Standard Table for PTA Relay before setting.
- Press "START" button.
- Repeat steps 9-1.(4) to (7).

Standard Table for PTA				Setting Condition				Standard Operation Time (Sec)
No.	OCR knob				TESTER (Current Base: in)			
	N/A Type		P/S Type					
	lu	lr	lr	lp	tp	R/S/T		
1	In standard does not influence operating time with any value setting.				0.7	5	1.3	1.278 ~ 1.917
2					0.8	10	3	0.627 ~ 0.940
3					1.0	40	6	0.980 ~ 1.470
4					1.1	45	10	0.480 ~ 0.720

* When PTA relay element test and long time relay factor test are performed at the same time, trip information is displayed after PTA trip information display according to relay setting.

* MCCB does not support PTA relay element function.