

VCB CRADLE CONTROLLER AND WIRED REMOTE CONTROL <U-MCRS> MANUAL

1. RATING SPEC

1) SPEC

No.	Classification	RATING
1	Control Power	AC 84~270V, DC 84~280V (Free voltage)
2	Motor	1. AC120(DC125) → DC110V Motor 2. AC240V(DC250) → DC220V Motor
3	Rating Frequency	1. 50/60Hz
4	SIZE	1. CONTROLLER: INCLUDE CASE 415(W) x 257(D) x 73(H) Main PCB 330(W) x 200(D) x 40(H) Relay PCB 110(W) x 62(D) x 35(H) 2. WIRED REMOTE CONTROL: 209.3(W) x 84.1(D) x 38.4(H)(mm) PCB 200(W) x 75(D) x 25(H)
5	Communication Port	Ethernet Port 3ea (Communication Remote control Modbus / PLC Connecting)
6	Communications Protocol	MODBUS (According to the LS electric MODBUS Standard)
7	Quantity of MODBUS Address	Rotary Switch 3ea (Total : 259ea)

2) Products Image



<Controller>



<WIRED REMOTE CONTROL>

3) Function

Drive the DC motor to move the VCB position to Disconnect, Test Connect by receiving an operation command through wired remote control communication and when an error occurs Controller and wired remote control capable of sending error messages

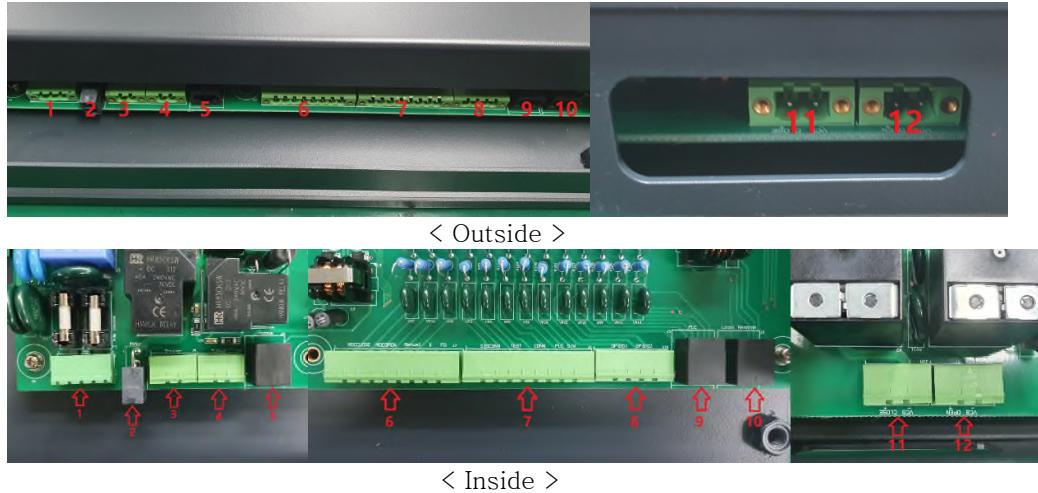
4) Hardware spec

- ① CPU: STM32F107VCT7
- ② Memory : Flash Memory 256KB

5) Input Terminal

- (1) 8 Pin Connector Terminal
 - Location Check Cell Switch: 6Pin
 - VCB Presence check Cell Switch: 2Pin
- (2) 8 Pin PCB Terminal (250V, 20A or more)
 - For MOC Close signal input: 2Pin
 - For MOC Open signal input: 2Pin
 - For Checking manual withdrawal operation Cell switch: 2Pin
 - For FG (Frame Ground) Terminal: 1Pin
- (3) 3 Pin PCB Terminal
 - Input Power Line (+, FG, -): 3Pin
- (4) 2 Pin PCB Connector
 - Motor Power Line: 2Pin
- (5) 2 Pin PCB Terminal
 - Current breaker connection terminal for 15A: 2Pin
- (6) 2 Pin PCB Terminal
 - Cell Switch (GPIO) connection terminal for user selection: 2Pin
 - PLC connection check terminal: 2Pin
- (7) 2Pin PCB Terminal
 - VCB CLOSE connection terminal: 2Pin
- (8) 2Pin PCB Terminal
 - VCB OPEN connection terminal: 2Pin

6) Input terminal configuration



- (1) Input Power (+,FG, -)
- (2) Motor Power(+, -)
- (3) Motor protection bracket (MCCB circuit breaker) connection
- (4) Upper Modbus communication(A,B) control(parallel with connector 5) → Do not connect in basic use
- (5) Upper Modbus communication(A,B) control (use only one of connectors 4and 5) → Do not connect in basic use
- (6) MOC Close, Open signal and Cell switch signal(contact) connection for checking manual in/out operation

- (7) Motor position check Cell switch signal(contact) connection
- (8) Cell Switch(GPIO) signal(contact) connection for user selection (Do not connect in basic use)
- (9) Check whether PLC connection terminal → Do not connect when using remote control
- (10) Remote control connection
- (11) VCB CLOSE signal contact connection
- (12) VCB OPEN signal contact connection

7) Standard operating environment

- (1) Use temperature: -30°C ~ + 70°C (Constant driving conditions)
- (2) Storage temperature: -40°C ~ + 70°C
- (3) Annual average relative humidity: ≤ 80%
- (4) Relative humidity for 30 consecutive days throughout the year: 95%
- (5) Installation height: 1000m or less in altitude

8) Pollution degree

- Level 3 (conductive contamination, contamination by drying and condensation)

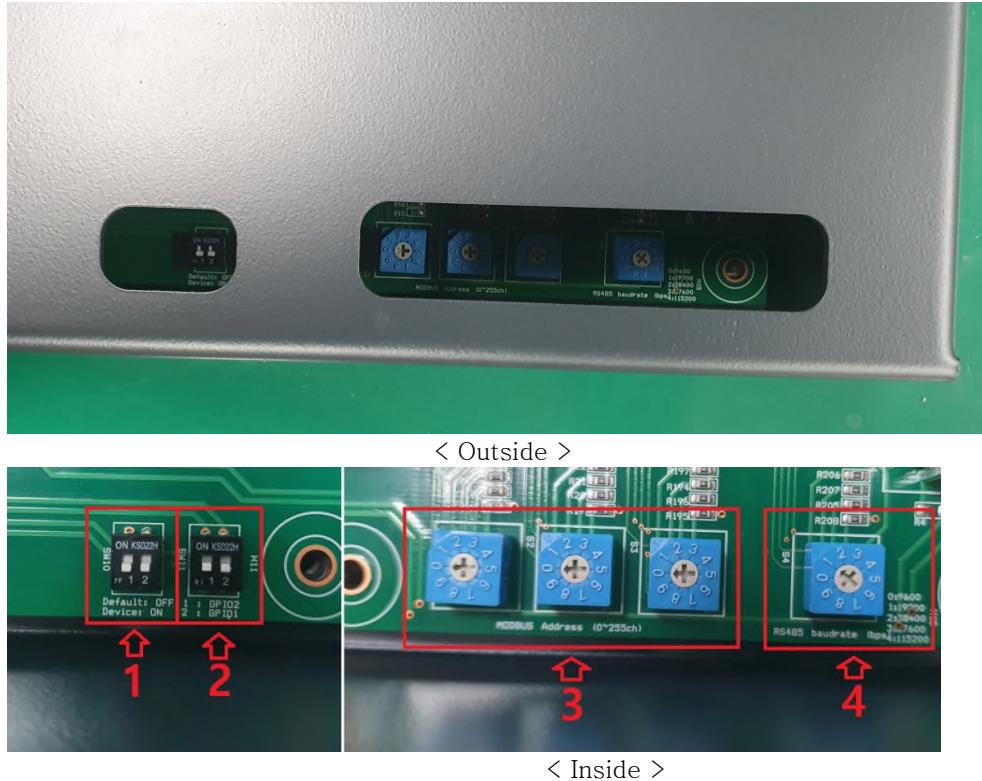
9) Basic operation

Button list	Function	Action when the button is executed	VCB status
Disconnect	Button to move VCB to Disconnect position	VCB at Test or Connect position moves to disconnect positon	VCB is open, and the button is executed only at the Connect or Test position.
Test	Button to move VCB to Test position	VCB in Disconnect or Connect position moves to Test position	VCB is in the open state and the button is executed only in the Connect or Disconnect position
Connect	Button to move VCB to connect position	VCB in Disconnect or Test position moves to Connect position	VCB is in the open state and the button is executed only in the disconnect or test position
STOP /RESET	Before ERROR: Button to forcibly stop the movement during movement After ERROR: Button to initialize all functions and activate only the remote control disconnect function	Before ERROR: If you press the STOP/RESET button during VCB movement operation, the movement operation stops immediately. After ERROR: Press the STOP/RESET button for 3 seconds to activate the Disconnect button and move the VCB to the Disconnect position. In the Disconnect position, all errors are cleared	Button can be executed only in VCB open state
VCB CLOSE	Button to close VCB	Close VCB in VCB OPEN state	The button can be executed only when MOC Open is disabled.
VCB OPEN	Button to open VCB	Open VCB in VCB CLOSE state	Button can be executed only in MOC Close in non-live state

10) Remote Control ERROR display items

Display indication	Error content	standard	Response in case of error	Error solution and operation
E00	Press Stop/Reset Button	When you press the Stop/Reset Button	All buttons except the Reset button are disabled	Solution: Press the Reset button for 3 seconds -> When the DISCONNECT button is activated, press the button to move the VCB to the DISCONNECT position.
E01	Motor overcurrent (15A)	MAX 15A or higher (requires actual measurement)	All buttons except the Reset button are disabled	Solution: Press the Reset button for 3 seconds -> When the DISCONNECT button is activated, press the button to move the VCB to the DISCONNECT position.
E02	Motor overheating	20 times of continuous operation within 20 minutes	All buttons except the Reset button are disabled	Solution: Press the Reset button for 3 seconds -> When the DISCONNECT button is activated, press the button to move the VCB to the DISCONNECT position.
E03	Motor operation time exceeded	45 seconds	All buttons except the Reset button are disabled	Solution: Press the Reset button for 3 seconds -> When the DISCONNECT button is activated, press the button to move the VCB to the DISCONNECT position.
E04	VCB location not available	No cell switch input or no cell switch input after a certain moving time	All buttons except the Reset button are disabled	Solution: Press the Reset button for 3 seconds -> When the DISCONNECT button is activated, press the button to move the VCB to the DISCONNECT position.
E05	VCB input state	MOC signal is closed	Reject all operation commands from the controller through MOC signal	Solution: Open VCB -> Error message automatically resets when open operation -> Normal use available
E06	Poor communication	Inability to communicate with the controller	Controller not available	Solution: Can be used after checking the terminal connection status or cable status and then checking the normal communication status between controllers
E07	No VCB	VCB in/out operation: 2~3A Connector in/out operation: 10A No cell switch input for checking the presence or absence of VCB (requires actual measurement)	All buttons except the Reset button are disabled	Solution: Press the Reset button for 3 seconds -> When the DISCONNECT button is activated, press the button to move the VCB to the DISCONNECT position. If the input of Cell Switch is confirmed after cradle up the VCB normally, all functions can be used normally.
E08	communication error	Inability to communicate with the remote control	Controller power off	Firmware error, contact LS Electric representative to update the firmware
E09	GPIO error	When GPIO input is False, motor current is applied or VCB is moved	All buttons except the Reset button are disabled	Solution: Press the Reset button for 3 seconds -> When the DISCONNECT button is activated, press the button to move the VCB to the DISCONNECT position.

11) How to communication speed, address, option setting



- (1) RS485 communication default (for basic installation) No.1,2 switch OFF / Device(in case of terminal installation) No.1,2 switch ON
- (2) When using Cell Switch(GPIO) for user selection, No.1,2 switch ON
- (3) Modbus communication address setting : 0~225ch setting
(When channel 15 is set, 0: 1: 5 is set from the left rotary switch)
- (4) RS485 communication speed setting
 - ① 9600bps → Rotary switch No.0
 - ② 19200bps → Rotary switch No.1
 - ③ 38400bps → Rotary switch No.2
 - ④ 57600bps → Rotary switch No.3
 - ⑤ 115200bps → Rotary switch No.4

12) How to Remote Control ERROR test

- (1) Position contact test and remote control communication and button test
(Test by combining the two items)
 - When the remote control button LED moves to the corresponding position, the button LED of the corresponding position flashes and lights up at the corresponding position.
 - It does not work when an error occurs.
- ① Connect location movement and operation experiment(logic test)
 - Start with U-MCS JIG Disconnect position contact ON → Press the connect button on the remote control → Connect button LED on the remote control blink → Relay ON → Disconnect switch of U-MCS JIG OFF → Connect switch ON → Relay OFF → Connect button on the remote control lights up → Press the close button on the remote control → Relay B/D Relay ON → U-MCS JIG Open button OFF → U-MCS JIG Close button ON → Representation of DOT LED 'E05' on the remote control(VCB

live wire status) → U-MCS JIG Close button OFF → U-MCS JIG Open button ON
 → Representation of DOT LED 'E05' on the remote control (normal)

- ② Test by changing only the remote control button and U-mcrs jig Contact signal in the same way as the test location movement and operation test connect
- ③ Remote control Stop/Reset button(logic test)
 - Press the Stop button on the remote control → Representation of DOT LED 'E00' on the remote control → Press Stop button for 3 seconds → Representation of DOT LED 'LS' on the remote control → Disconnect button LED on the remote control blink → Press Disconnect button on remote control → Relay ON → U-MCS JIG Test contact OFF → U-MCS JIG Disconnect con ON → Disconnect button on the remote control lights up → Reset all errors
 - If there is no problem when operating in the above order, the test of the controller's location contact and remote control buttons and LED functions is completed.

(2) Error items (Execute reset after error occurs)

- All error items are executed in a normal state.

- ① Normal → DOT LED 'L S' on the remote control
- ② Press the stop button on the remote control → DOT LED 'E00' on the remote control
- ③ Release the motor connector and press the position move button → Judged by disconnection DOT LED 'E 0 1' on the remote control
 Press the position move button after connecting the motor connector → Increase the load value of the resistance load to 2.8A(RMS) → Judging as overcurrent 'E01' on the remote control
- ④ Position movement repeat operation 20times(within 20minutes) → Judging that the Motor is overheating 'E02' on the remote control
- ⑤ Move the location by pressing the location button on the remote control and do not give the contact signal of U-MCS JIG → Judged that the operation time is exceeded after 30 seconds 'E03' on the remote control
- ⑥ Turn off all contact points of U-MCS JIG or attach two or more contact points → Judging that VCB location cannot be confirmed 'E04' on remote control
- ⑦ Press the close button on the remote control at the Connect Position → Turn off the Open button of U-MCS JIG and turn on the Close button → 'E 0 5' (E05 error is automatically reset when it is restored to normal)
- ⑧ Modbus communication failure → 'E 0 6'
- ⑨ Increase the value of the load resistor by 0.5A(RMS) or more while moving the VCB position → Maintains the load value while moving the normal VCB position → Judging that there is no VCB → 'E 0 7'
- ⑩ Separate remote control and controller for more than 3seconds → Connect the remote control to the controller → Judging by communication error with the remote control → 'E 0 8'
- ⑪ Turn on the GPIO contact of U-MCS JIG → Judging as a GPIO error → 'E 0 9'

(3) PLC control

- Turn on and control PLC SW of U-MCRS while disconnecting the connection between the controller and the remote control

- ① Since it is a communication error by releasing the remote control, reset it and move to the Disconnect position
- ② Go to Connect location
- ③ Go to Test location

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

Note: 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.

1) FCC Part 15.19(a) [interference compliance statement], unless the following statement is already provided on the device label:-

“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.”

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