Installation, Operation & Maintenance Instructions

Model RCU
Remote Control Unit

Thank you for purchasing the Model RCU Remote Control Unit from BlueLevel Technologies. We sincerely appreciate your business and strive to make your experience with us and our products uniquely positive.

⚠ This document contains information necessary to ensure a safe and successful installation. **PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE PROCEEDING** and comply with the section on page 3 of this document pertaining to SAFETY to ensure proper operation of the equipment and personnel safety.

Before discarding the shipping container, please inspect it thoroughly and verify that all parts are accounted for. If you have any questions please do not hesitate to contact us on our website at www.blueleveltechnologies.com, by email bluelevel@blueleveltechnologies.com or by phone at 330-523-5215 or by fax at 330-523-5212.

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Safety Terms & Symbols

⚠ **WARNING:** Warning statements identify conditions or practices that could result in injury or loss of life. Risk of electrical shock exists.

CAUTION: Caution statements identify conditions or practices that could result in damage to this product or other property.

Safety Summary

⚠ **General Safety**
CAUTION: It is important that all instructions within this manual be followed to ensure proper operation of the equipment and safety of operating personnel. The product should be installed, commissioned and maintained by qualified and authorized personnel only. Install according to installation instructions and comply with all National and Local codes. Use electrical wire that is sized and rated for the maximum voltage and current of the application.

⚠ **Electrical Shock Caution**
Model RCU Remote Control Unit may be powered with HIGH VOLTAGE. No operator serviceable parts are inside. All servicing is to be performed by qualified personnel.

⚠ **Electrical Location Caution**
The Model RCU remote control unit is suitable for Ordinary Hazardous Locations only (refer to Technical Data).

Enclosure Integrity – The Model RCU enclosure is manufactured from polypropylene and is rated IP65. The user or installer should consider the performance of this enclosure material and rating with regard to attack by aggressive substances that may be present and the operating environment. The dimensions of the enclosure shall not be altered.

⚠ **Maintenance** – Power to all circuits must be disconnected before conducting any investigation, setup or maintenance of the unit.

Electromagnetic Compatibility (EMC):
The Model RCU remote control unit is designed to comply with the standards listed below:

Low Voltage Directive:	73/23/EEC
Standard IEC:	61010-1 (ED.2):2004
EMC Emissions	EN 61326-1:2006
EMC Immunity	EN 61326-1:2006
Models:	Model RCU Universal 20-250VAC/VDC

Test report data may be obtained from BlueLevel Technologies.

Mechanical Installation

PRIOR TO INSTALLATION:

1. **Placement of Sensor –** An indoor mounting location is preferred for the Model RCU. If choosing an outdoor location consider the following:

    a. Choose a location for the RCU where the unit will be shaded and not in direct sunlight. Direct sunlight can cause a “washout” or create difficult viewing the display.

    b. The RCU is rated IP65 and is suitable for outdoor use, however, it is always advisable to shield the enclosure from continuous rain and inclement weather to preserve the longevity of the enclosure rating. If possible shield the RCU from continuous rain and weather.

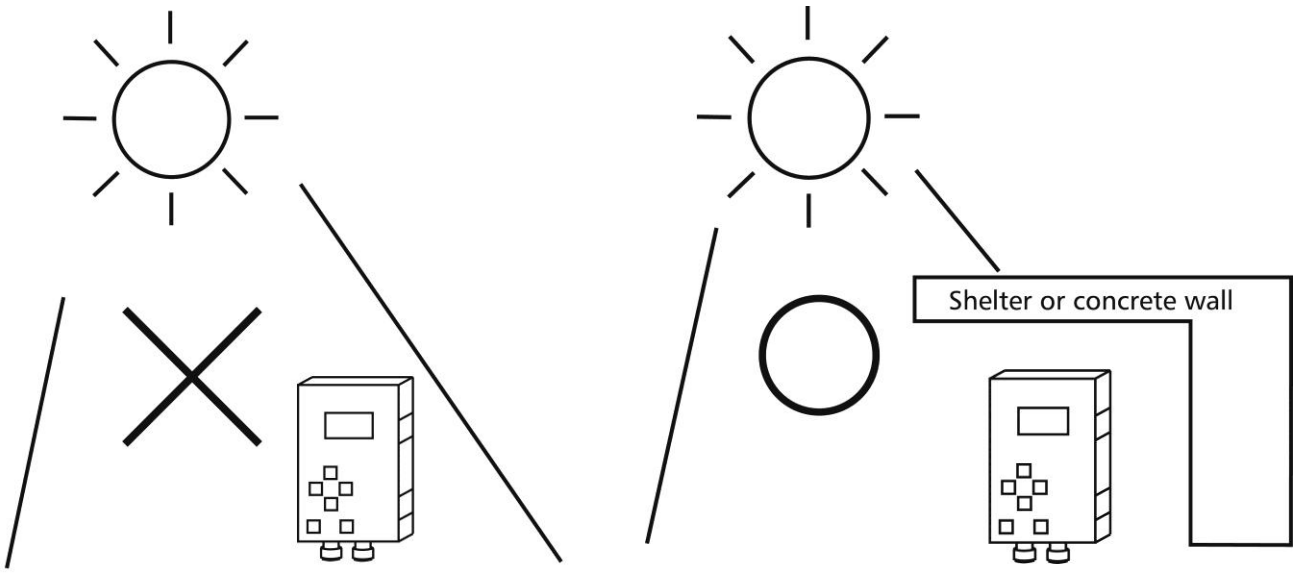


Figure 1: Choosing proper mounting location

2. **Environment** – The Model RCU is rated for ambient operating temperatures from -40º C to +85ºC. Consider this ambient temperature rating when choosing the proper mounting location.

MOUNTING:

1. **Mounting RCU –** The Model RCU remote control unit is designed for wall mounting using four (4) mounting screw holes within the base of the enclosure accessible after opening the RCU cover.

Mechanical Installation Cont'd

MOUNTING CONT'D:

a. Remove six (6) screws from cover to enable the opening of the RCU cover. The cover is hinged on the right side of the enclosure with external plastic hinges. The cover opens left to right.

b. Take care when opening the RCU cover not to damage or remove the cover gasket or enclosure integrity will be compromised leading to the possibility of failure of the RCU due to ingress of water and particulate.

c. After opening the cover the four (4) mounting holes will be visible near each of the four corners of the base of the enclosure. See Figure 2.

d. Secure the RCU to the mounting surface using appropriate fasteners.

e. Close RCU cover with gasket in the appropriate place and tighten cover screws. Do not over tighten the cover screws.

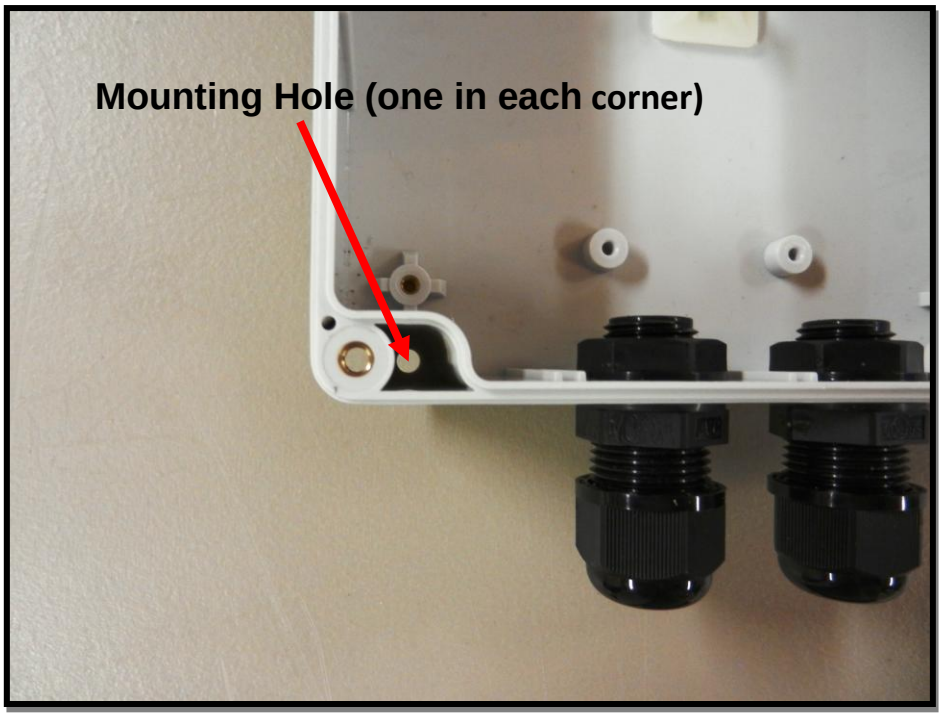


Figure 2: Mounting holes inside base of RCU enclosure

Instrument Function

INTRODUCTION:

The Remote Control Unit (hereinafter RCU) is utilized to read and control level sensing instruments, including the Model WC smart inventory sensor, available from BlueLevel Technologies connected through hardwired RS-485 or ZigBee (optional) wireless standards. All data received from sensors can be displayed on the RCU display either one or four sensors at a time. Smart and easy-to-use, the RCU allows the operator of the level sensors to quickly and easily revise sensor program parameters and to monitor measurement and other data from each sensor, up to 128 sensors per network (two networks per RCU provided). Using the industry standard MODBUS protocol the RCU is designed to connect our current and future level sensors.

CHARACTERISTICS:

- Utilizes MODBUS protocol
- Easy to use and setup
- Universal power supply of 20~250VAC/VDC
- Communication interface is hardwire RS-485 or ZigBee wireless standard
- Alarm relay output included
- LED indicators:
    - “Measure” (Green) - illuminates when any connected sensor is measuring
    - “Master” (Red) – RCU communicating with the sensor(s) (off when ZigBee is in on)
    - “Slave” (Red) – RCU communicating with a PC
    - “ZigBee” (Red) – RCU communicating with the sensor(s) via ZigBee (off when Master is on)
    - “Alarm” (Red) – illuminated when any alarm is detected at any sensor
- Main Display:
    - Liquid Crystal (blue/white)
    - Graphic 128x64 Dots
- Two RS-485 networks; one ZigBee wireless network (optional)
- Units Under Control (UUC) - allows user to monitor only a subset of sensors connected on the network

TEST & PROTECTION:

- Enclosure Protection - IP65 (IEC60529)
- Pressure Test - IEC60947-2
- Insulation Resistance Test - IEC60092-504
- Power Supply Test - IEC60092-504
- Power Supply Failure Test - IEC60092-504

Electrical Installation

HAZARDOUS LOCATION PRECAUTIONS:

⚠ Refer to Safety Summary section on page 3 of this manual before beginning electrical connections.

The Model RCU remote control unit is **NOT** certified for use in and should not be used or installed and operated in hazardous locations.

For all models, ensure that the power source is disconnected before removing the cover, and upon completion ensure that the cover is completely secured in place.

PERMANENTLY CONNECTED EQUIPMENT:

⚠ Disconnecting devices shall be included in the system installation. In installations where multiple circuits are used, individual disconnects are required.

Disconnects shall be within close proximity of the equipment, accessible to operators, and marked appropriately as being the specific disconnect for the associated circuit.

Assure all disconnect ratings are appropriately sized for the circuit protected (Refer to Technical Data section).

CIRCUIT SEPARATION:

Since the wiring compartment of the Model RCU cannot absolutely protect against physical contact between multiple circuits, it is required that all wiring used must have an insulation rating of 300v minimum, and a minimum temperature rating of 194° F (90° C).

GENERAL:

The Model RCU remote control unit can be powered with 20-250VAC, 50/60Hz supply voltages or 20-250VDC.

Field wiring should conform to all national and local electrical codes and any other agency or authority having jurisdiction over the installation. Electrical wiring connections and installation shall be done by qualified personnel.

Refer to Figure 3 and Table 1 for all wiring connections.

Table 1: Electrical connections for Model RCU remote control unit

TERMINAL	PCB MARKING	DESCRIPTION
1, 2	S485	RS-485 terminal for the PC (S485+ S485-)
3, 4, 5 and 6	M485+ (3 and 5) M485- (4 and 6)	RS-485 network terminals: Network 1 – terminals 3+ and 4- Network 2 – terminals 5+ and 6-
7, 8	NO1 COM1	Material level alarm, sensor error, or disconnection of any sensor connected on network (s)
9, 10	L N	Power input (20-250 VAC/VDC L, N)

Electrical Connections Cont'd.

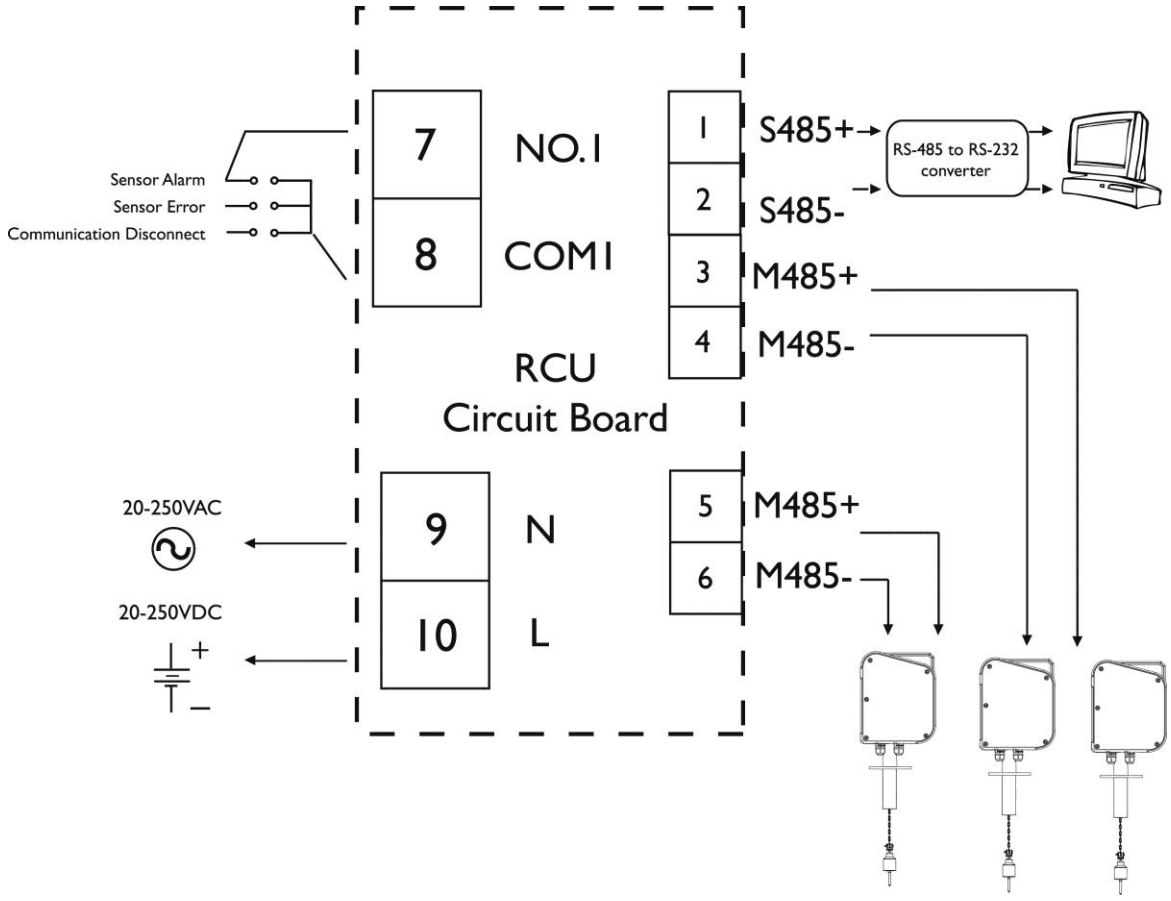


Figure 3: Electrical connections

INPUT POWER:

Power input to the Model RCU is connected to terminals labeled N and L. Refer to Figure 3.

MODBUS:

The RCU is equipped with two MODBUS sensor networks, Network 1 is connected using terminals 3 and 4, Network 2 is connected using terminals 5 and 6. If sensors are connected on different networks you should document which sensors are on each so that you can interpret data from the RCU display successfully.

The level sensors (such as the Model WC smart inventory sensor) and the Model RCU remote control unit must be connected in a "daisy-chain, multi-drop configuration. The order of connection is not important, however, the MODBUS communication network wiring interconnection must have only two ends with all units serial inline, without electrical "T" connections. All MODBUS wiring joints should be at the Model WC wiring terminals. Refer to Figure 10. Use terminals 14 (TR+) and 15 (TR-) for MODBUS wiring connections.

Electrical Connections Cont'd.

Line termination may be required for proper implementation of the entire serial bus. A reflection in the transmission line can result from an impedance discontinuity. To minimize the reflections place a line termination resistor at each of the two ends of the bus. The line termination resistor can be a 0.5W 140ohm resistor.

For further information regarding MODBUS refer to the document titled "MODBUS over Serial Line Specification & Implementation Guide V1.0" dated 12/2/02 available at www.modbus.org.

Programming

DISPLAY/KEYPAD FUNCTIONALITY (MAIN DISPLAY – SINGLE SENSOR):

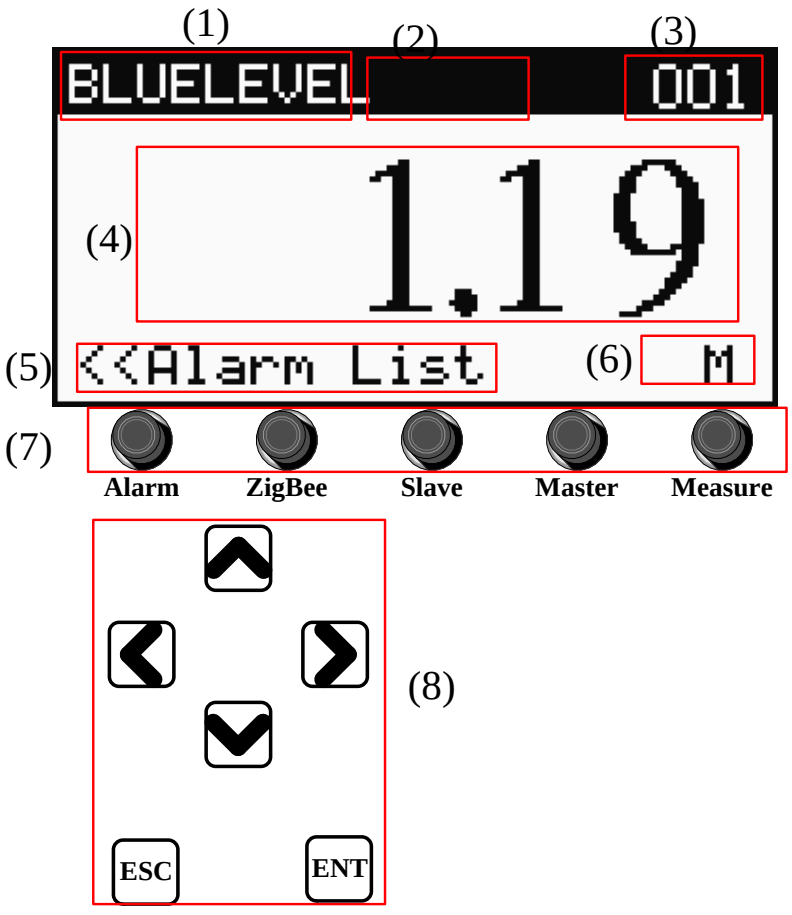


Figure 4: Model RCU keypad / main display (single sensor display)

Programming Cont'd.

DISPLAY/KEYPAD FUNCTIONALITY (MAIN DISPLAY – SINGLE SENSOR) CONT'D:

Table 2: RCU primary display/keypad functionality (refer to Figure 4 above)

NO.	ITEM	DESCRIPTION	
(1)	Manufacturer Name	BlueLevel Technologies, Inc.	
(2)	Alarm Status	H (high level alarm), L (low level alarm), Blank (no alarm)	
(3)	Sensor ID	sensor being viewed or displayed	
(4)	Value	value that the sensor measures	
(5)	Alarm	indicates sensor has an alarm	
(6)	Unit	Metric (m) or English (ft) units	
(7)	LED Indicators	Alarm	alarm signal detected
		ZigBee	ZigBee sensor network in use
		Slave	connected and communicating with a PC via hardwire RS-485
		Master	connected and communicating with sensor(s) via hardwire RS-485
		Measure	Indicates sensor(s) measuring
(8)	Buttons		*Previous*: shows last sensor ID displayed (in main display) *Add*: increase the value in the number column *Up*: moves the cursor up
			"Alarm List" displayed: enters sensor alarm list (in main display) *Left:* moves the cursor to the left
			Forward: shows the next sensor ID to be displayed (in main display) *Reduce:* reduces the value in the number column *Down:* moves the cursor down
			Enter "RCU Password": move to RCU password entry screen (in the main display) *Right:* move the cursor to the right
			Escape: to initiate hardware refresh when adding or changing sensors (in main display) *Back*: moves back to the previous page or item within programming menus or while in displays entering numbers
			Enter: move to enter user password for initiating manual measure (Model WC sensors) or reprogramming sensor(s) (in the main display) *Save:* save data entered and proceeds to the next programming page while in number-entering display

Programming Cont'd.

DISPLAY/KEYPAD FUNCTIONALITY (MAIN DISPLAY – FOUR SENSORS) CONT'D:

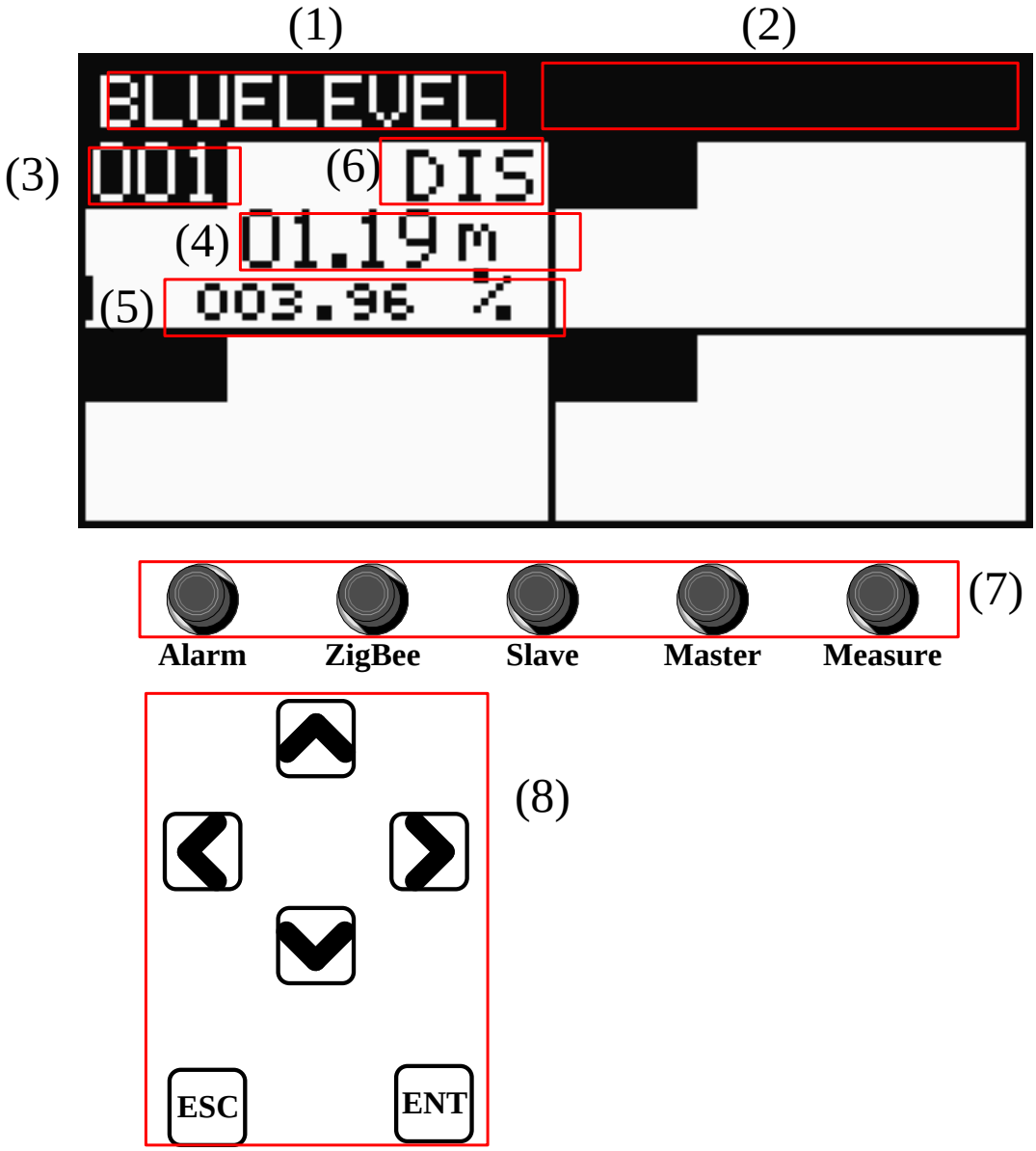
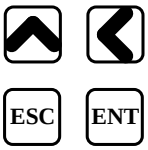
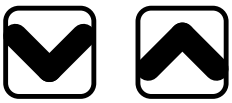


Figure 5: Model RCU keypad / main display (FOUR sensor display)

Programming Cont'd.

DISPLAY/KEYPAD FUNCTIONALITY (MAIN DISPLAY – FOUR SENSORS) CONT'D:

Table 3: RCU primary display/keypad functionality (refer to Figure 5 above) – FOUR sensor main display

NO.	ITEM	DESCRIPTION	
(1)	Manufacturer	BlueLevel Technologies, Inc	
(2)	Alarm Signal	displayed when the sensor sends an alarm signal	
(3)	Sensor ID	sensor connected and being displayed in quadrant	
(4)	Value & Unit	most recent measurement value from the sensor	
(5)	Measurement Percentage	percentage (%) of material level (percent full)	
(6)	Displayed Value	DIS (distance) or LVL (level)	
(7)	LED indicators	Alarm	alarm signal detected
		ZigBee	ZigBee wireless in use
		Slave	connected and communicating w/ a PC on RS-485
		Master	connected and communicating w/ sensor(s) on RS-485
		Measure	sensor measuring
(8)	Buttons		Refer to Figure 6
			*Previous/ Forward:* See the last or next set of four sensors data (in main display)

Programming Cont'd.

MAIN DISPLAY FLOWCHART (Shown with One Sensor Display)

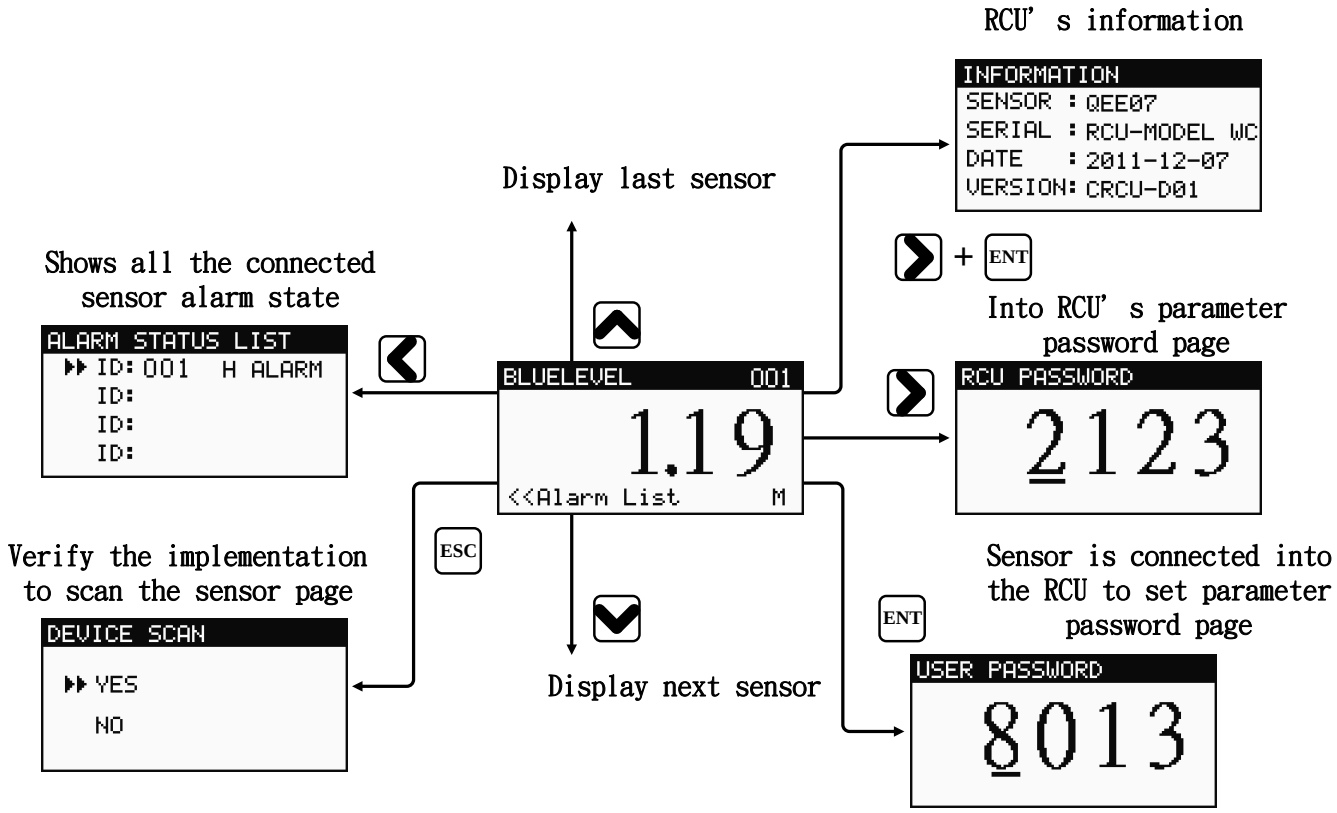


Figure 6: RCU flowchart from main display (shown with one sensor display)

From the main display of the RCU, with either one or four sensor data being displayed (shown with one sensor displayed in Figure 6), there are seven (7) possible movements:

UP ARROW – Press the UP arrow key from the sensor data display to display the data for the *previous* sensor in the network. Sensor display order is based upon the sensor network address (001 through 255).

DOWN ARROW – Press the DOWN arrow key from the sensor data display to display the data for the *next* sensor in the network. Sensor display order is based upon the sensor network address (001 through 255).

RIGHT ARROW – Press the RIGHT arrow key to enter the RCU SETTING menu. RCU PASSWORD will be requested prior to entering the RCU SETTING menu.

LEFT ARROW – Press the LEFT arrow key to review the ALARM STATUS LIST.

RIGHT + ENT – Press the RIGHT arrow key + the ENT key at the same time to display the RCU INFORMATION.

ENT – Press the ENT key to enter the USER operation menu. USER PASSWORD will be requested prior to entering the RCU operation menu.

ESC – Press the ESC key to scan the MODBUS sensor network(s) for active sensors and their information.

Programming Cont'd.

RCU SETUP PARAMETER PROGRAMMING FLOWCHART

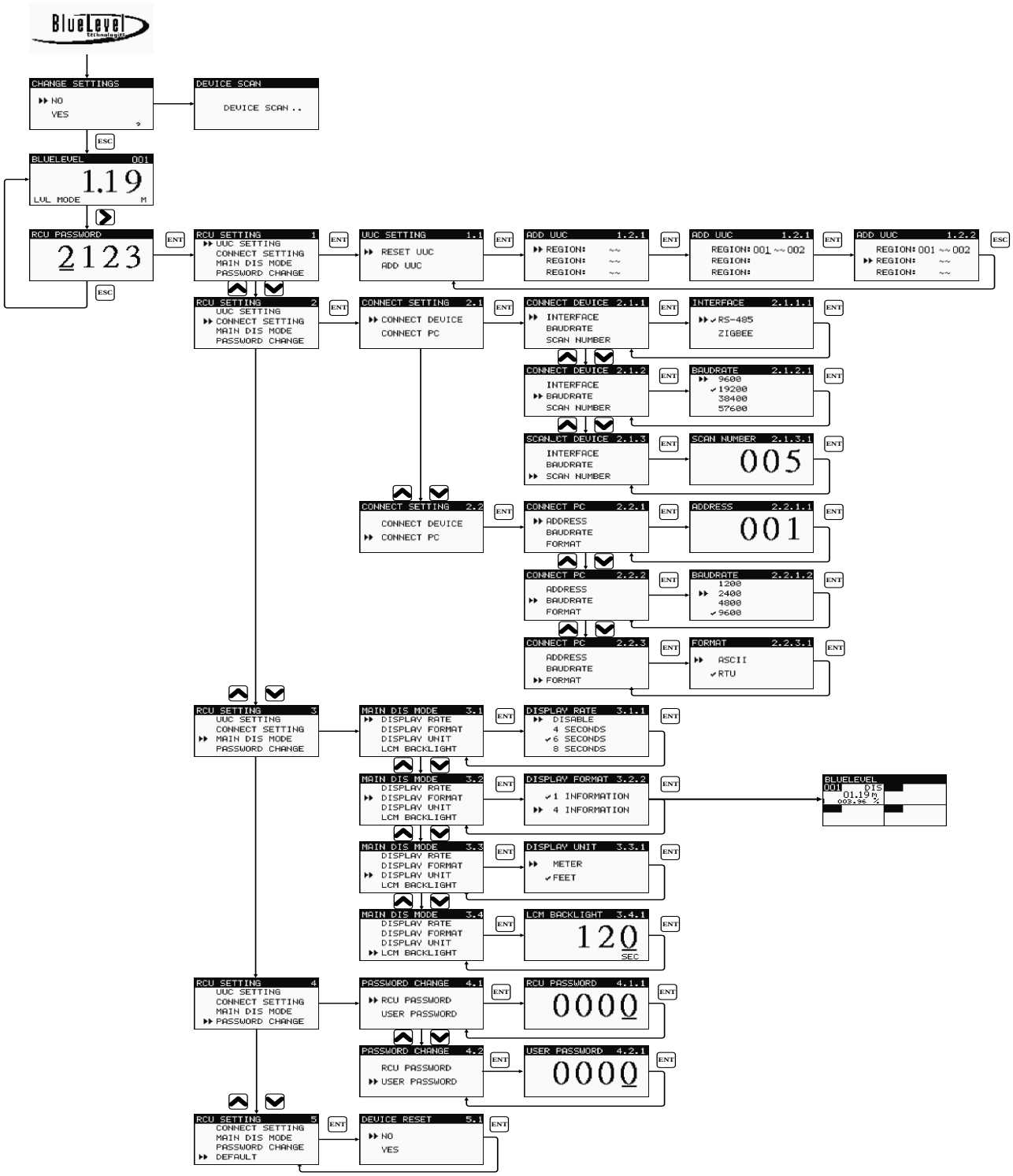


Figure 7: RCU setup programming flowchart

Programming Cont'd.

PARAMETER PROGRAMMING FLOWCHART

Table 4: Programming parameters for RCU remote control unit

PARAMETER DISPLAY / DEFAULT	IINSTRUCTIONS / ADJUSTMENT
CHANGE SETTINGS **>> NO** **YES**	The "CHANGE SETTINGS" screen appears after power-up of Model RCU Use UP AND DOWN keys to choose YES or NO then press ENT key to confirm your selection *Press YES* >> The RCU is now refreshing the hardware. Note: Parameters of UUC (units under control) will be cleared *Press NO* >> RCU scans connected sensor network(s) and settings remain unchanged, then goes to the next page
RCU PASSWORD **0 0 0 0**	Use RIGHT and LEFT keys to move cursor, use UP and DOWN keys to increase or decrease the number for each password character then press ENT key to move past password entry
RCU SETTING 1 **>> UUC SETTING** **CONNECT SETTING** **MAIN DIS MODE** **PASSWORD CHANGE** **DEFAULT**	Use UP and DOWN keys to move cursor to desired item (UUS SETTING< CONNECT SETTING< MAIN DIS MODE o PASSWORD CHANGE), then press ENT key to select desired next step *UUC (Units Under Control)* >> Enter menu to set Groups of sensors. Allows you to interface and control only a subset of the devices connected to the sensor network(s). Press ENT key to setup or change UUC settings (refer to Figure 8 and Table 5 for further information) *CONNECT SETTING* >> Select CONNECT SETTING to setup communication connection settings with sensors (CONNECT DEVICE) or PC (CONNECT PC) *MAIN DIS MODE* >> Select this setting to setup the Display format, units and the refresh time of the main display *PASSWORD CHANGE* >> Enter to change the RCU PASSWORD
UUC SETTING 1.1 **>> RESET UUC** **ADD UUC**	Press ENT key to change the UUC settings *RESET UUC* >> Press ENT to clear the current groups *ADD UUC* >> Press ENT to add Groups (refer to Table 5)
RCU SETTING 2 **UUC SETTING** **>> CONNECT SETTING** **MAIN DIS MODE** **PASSWORD CHANGE** **DEFAULT**	Press ENT key to setup communication connection settings with PC and sensor(s)
CONNECT SETTING 2.1 **>> CONNECT DEVICE** **CONNECT PC**	Press ENT to setup communication settings between the RCU and the sensor(s) connected (the RCU serves as Master MODBUS device)

Programming Cont'd.

Table 4 Cont'd: Programming parameters for RCU remote control unit

PARAMETER DISPLAY / DEFAULT		IINSTRUCTIONS / ADJUSTMENT
CONNECT DEVICE **>> INTERFACE** **BAUDRATE** **SCAN NUMBER**	**2.1.1**	Choose INTERFACE and press ENT key to select either RS-485 or Zigbee wireless Choose BAUDRATE and press ENT to choose baudrate of sensor communication network(s) Choose SCAN NUMBER and press ENT key to limit the quantity of sensors the RCU will refresh (the more sensors chosen, the long it takes)
INTERFACE **>> RS-485** **ZIGBEE**	**2.1.1.1**	Use the UP and DOWN keys to choose RS-485 (hardwired) or ZIGBEE (wireless) and press ENT to select (factory default is RS-485) and save your chosen setting Press ESC to go back to previous page without saving
CONNECT DEVICE **INTERFACE** **>> BAUDRATE** **SCAN NUMBER**	**2.1.2**	Use the UP and DOWN keys to choose BAUDRATE and press ENT to choose and select the communication baudrate for the sensor network(s)
BAUDRATE **>> 9600** **✓ 19200** **38400** **57600**	**2.1.2.1**	Use and UP and DOWN keys to choose the desired baudrate then press ENT to save your setting Press ESC key to go back to the previous page without saving
SCAN DEVICE **INTERFACE** **BAUDRATE** **>> SCAN NUMBER**	**2.1.3**	Use UP and DOWN keys to choose SCAN NUMBER then press the ENT key to enter the setting
SCAN NUMBER **005**	**2.1.3.1**	Use the LEFT and RIGHT arrow keys to move cursor to the digit that is to be adjusted, then use the UP and DOWN keys to increase or decrease the digits as needed (range = 1-128) Press ENT to save entered data Press ESC to go back to the previous page without saving changes (factory default is 128)
CONNECT SETTING **CONNECT DEVICE** **>> CONNECT PC**	**2.2**	Select CONNECT PC and press ENT key to setup communication between RCU and PC
CONNECT PC **>> ADDRESS** **BAUDRATE** **FORMAT**	**2.2.1**	Chose ADDRESS and press ENT key to perform PC address setup

Programming Cont'd.

Table 4 Cont'd: Programming parameters for RCU remote control unit

PARAMETER DISPLAY / DEFAULT	IINSTRUCTIONS / ADJUSTMENT
ADDRESS **2.2.1.1** **001**	Use the LEFT and RIGHT arrow keys to move cursor to the digit that is to be adjusted, then use the UP and DOWN keys to increase or decrease the digits as needed (range = 1-255) Press ENT to save entered data Press ESC to go back to the previous page without saving changes (factory default is 001)
CONNECT PC **2.2.2** **INTERFACE** **>> BAUDRATE** **FORMAT**	Choose BAUDRATE and press ENT key to select the baudrate for PC communications
BAUDRATE **2.2.1.2** **1200** **>> 2400** **4800** **✓ 9600**	Use the UP and DOWN keys to choose the baudrate and press ENT to select (factory default is 9600) and press ENT to save your setting Press ESC to go back to previous page without saving
CONNECT PC **2.2.3** **INTERFACE** **BAUDRATE** **>> FORMAT**	Choose FORMAT and press ENT key to select the setting for PC communication format (ASCII or RTU)
FORMAT **2.2.3.1** **>> ASCII** **✓ RTU**	Use and UP and DOWN keys to choose the desired communication format with PC then press ENT to save your setting (factory default for PC is RTU) Press ESC key to go back to the previous page without saving
RCU SETTING **3** **UUC SETTING** **CONNECT SETTING** **>> MAIN DIS MODE** **PASSWORD CHANGE** **DEFAULT**	Use UP and DOWN keys to choose MAIN DIS MODE then press the ENT key to enter settings for the main display use
MAIN DIS MODE **3.1** **>> DISPLAY RATE** **DISPLAY FORMAT** **DISPLAY UNIT** **LCM BACKLIGHT**	Use the UP and DOWN arrow keys to move cursor to DISPLAY RATE in order to make setting adjustment

Programming Cont'd.

Table 4 Cont'd: Programming parameters for RCU remote control unit

PARAMETER DISPLAY / DEFAULT	IINSTRUCTIONS / ADJUSTMENT
DISPLAY RATE **3.1.1** **>> DISABLE** **4 SECONDS** **✓ 6 SECONDS** **8 SECONDS**	Use the UP and DOWN arrow keys to move cursor to the desired setting The DISPLAY RATE will determine the length of time before the main display will change between sensors (factory default is 6 seconds) Press ENT to save entered data Press ESC to go back to the previous page without saving changes (factory default is 001)
MAIN DISPLAY MODE **3.2** **DISPLAY RATE** **>> DISPLAY FORMAT** **DISPLAY UNIT** **LCM BACKLIGHT**	Choose DISPLAY FORMAT and press ENT key to select the format of the main display (one or four sensors at a time)
DISPLAY FORMAT **3.2.1** **✓ 1 INFORMATION** **>> 4 INFORMATION**	Use the UP and DOWN keys to choose either one or four sensor main display and press ENT to select and save your setting (factory default is one) Press ESC to go back to previous page without saving
MAIN DISPLAY MODE **3.3** **DISPLAY RATE** **DISPLAY FORMAT** **>> DISPLAY UNIT** **LCM BACKLIGHT**	Choose DISPLAY UNIT and press the ENT key to select the engineering units for the primary measurement in the main display
DISPLAY UNIT **3.3.1** **>> METER** **✓ FEET**	Use the UP and DOWN keys to choose either METER or FEET and press ENT to select and save your setting (factory default is FEET) Press ESC to go back to previous page without saving
MAIN DISPLAY MODE **3.4** **DISPLAY RATE** **DISPLAY FORMAT** **DISPLAY UNIT** **>> LCM BACKLIGHT**	Choose LCM BACKLIGHT and press the ENT key to select the "on time" for the L:CM display backlight
LCM BACKLIGHT **3.4.1** **1 2 0**	Use the RIGHT and LEFT arrow keys to move the cursor to the digit to be adjusted, then use the UP and DOWN arrow keys to increase or decrease the digits, ranged from 1 to 999 Press ENT to confirm and save the setting Press ESC to go back to previous page without saving

Programming Cont'd.

Table 4 Cont'd: Programming parameters for RCU remote control unit

PARAMETER DISPLAY / DEFAULT		IINSTRUCTIONS / ADJUSTMENT
RCU SETTING **UUC SETTING** **CONNECT SETTING** **MAIN DIS MODE** **>> PASSWORD CHANGE** **DEFAULT**	**4**	Use the UP and DOWN arrow keys to select PASSWORD CHANGE in order to modify the RCU passwords
PASSWORD CHANGE **>> RCU PASSWORD** **USER PASSWORD**	**4.1**	Choose RCU PASSWORD and press ENT key to change the password for accessing the RCU SETTING menu items
RCU PASSWORD **0 0 0 0**	**4.1.1**	Use the RIGHT and LEFT keys to move the cursor to the digit that requires adjustment, use UP and DOWN keys to increase and decrease digit value, then press ENT to select and save your setting (factory default is 0000) Press ESC to go back to previous page without saving
PASSWORD CHANGE **RCU PASSWORD** **>> USER PASSWORD**	**4.2**	Choose USER PASSWORD and press ENT key to change the password for accessing the operation menu to initiate manual measurement on any or all sensors, or to make changes to sensor setup
USER PASSWORD **0 0 0 0**	**4.2.1**	Use the RIGHT and LEFT keys to move the cursor to the digit that requires adjustment, use UP and DOWN keys to increase and decrease digit value, then press ENT to select and save your setting (factory default is 0000) Press ESC to go back to previous page without saving
RCU SETTING **UUC SETTING** **CONNECT SETTING** **MAIN DIS MODE** **PASSWORD CHANGE** **>> DEFAULT**	**5**	Choose DEFAULT to reset all RCU settings back to factory defaults and press the ENT key
DEVICE RESET **>> NO** **YES**	**5.1**	Use the UP and DOWN arrow keys to choose NO or YES, then press ENT to confirm Press ESC to go back to previous page without saving NOTE: RCU factory defaults include the following: Interface to sensor – RS485; Baudrate to sensor – 9600; Scan number to the sensor – 20; Baudrate to PC – 9600; RCU ID for PC – 001; Format for PC – RTU; Refresh time for main display – 65; Display Format – one sensor display; Display Unit – Feet; LCM Backlight – 120 sec; Language – English; UUC - cleared

Programming Cont'd.

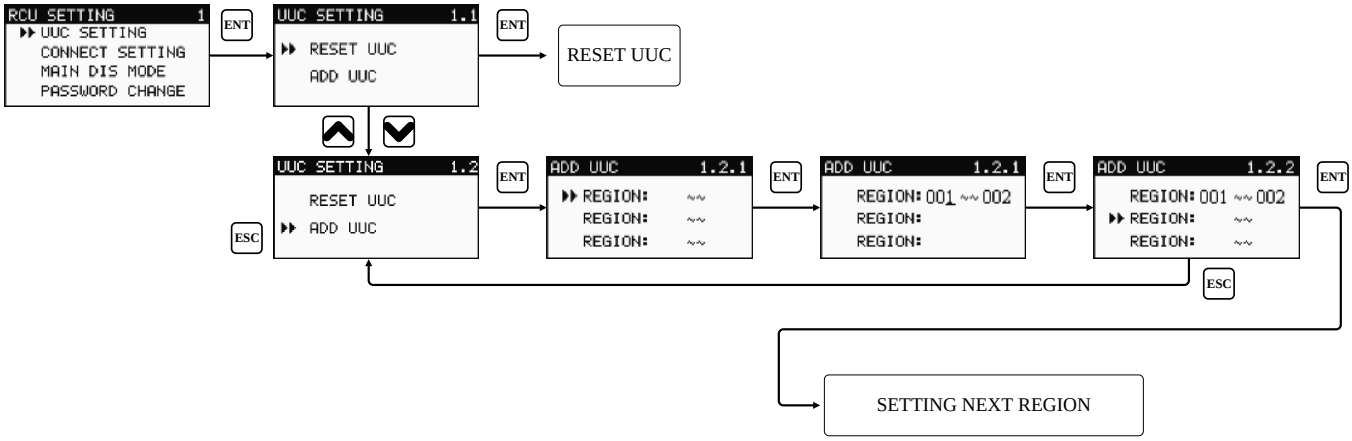


Figure 8: UUC Units Under Control Menu

The UUC SETTING within the RCU SETTING menu allows the establishment of groups of sensors to be controlled by the RCU. For example, suppose there is a single sensor network with a total of thirty (30) sensors connected but you desire to control only eight (8) of these sensors with the RCU. The UUC settings allow you to accomplish this.

Table 5: RCU UUC (Units Under Control) menu parameters

PARAMETER DISPLAY / DEFAULT	IINSTRUCTIONS / ADJUSTMENT
RCU SETTING **1** **>> UUC SETTING** **CONNECT SETTING** **MAIN DIS MODE** **PASSWORD CHANGE** **DEFAULT**	Use the UP and DOWN arrow keys to select UUC SETTING in order to enter the UUC SETTING menu, reset or setup the UUC's
UUC SETTING **1.1** **>> RESET UUC** **ADD UUC**	Use UP and DOWN arrow keys to select either RESET UUC or ADD UUC and press ENT RESET UUC will clear all previously setup UUC
ADD UUC **1.2.1** **>> GROUP:** **GROUP:** **GROUP:**	Select ADD UUC in menu item 1.1 (above) and press the ENT key to do the setup Use the UP and DOWN arrow keys to select the GROUP that you want to setup (generally begin by selecting the first GROUP in the list) Press ENT key to setup the chosen GROUP Press ESC to go back to previous page without saving

Setup & Operation

Figure 9 illustrate a typical operational installation. This examples shows an RC connected with ten (10) Model WC smart inventory monitoring sensors and a slave connection to a PC.

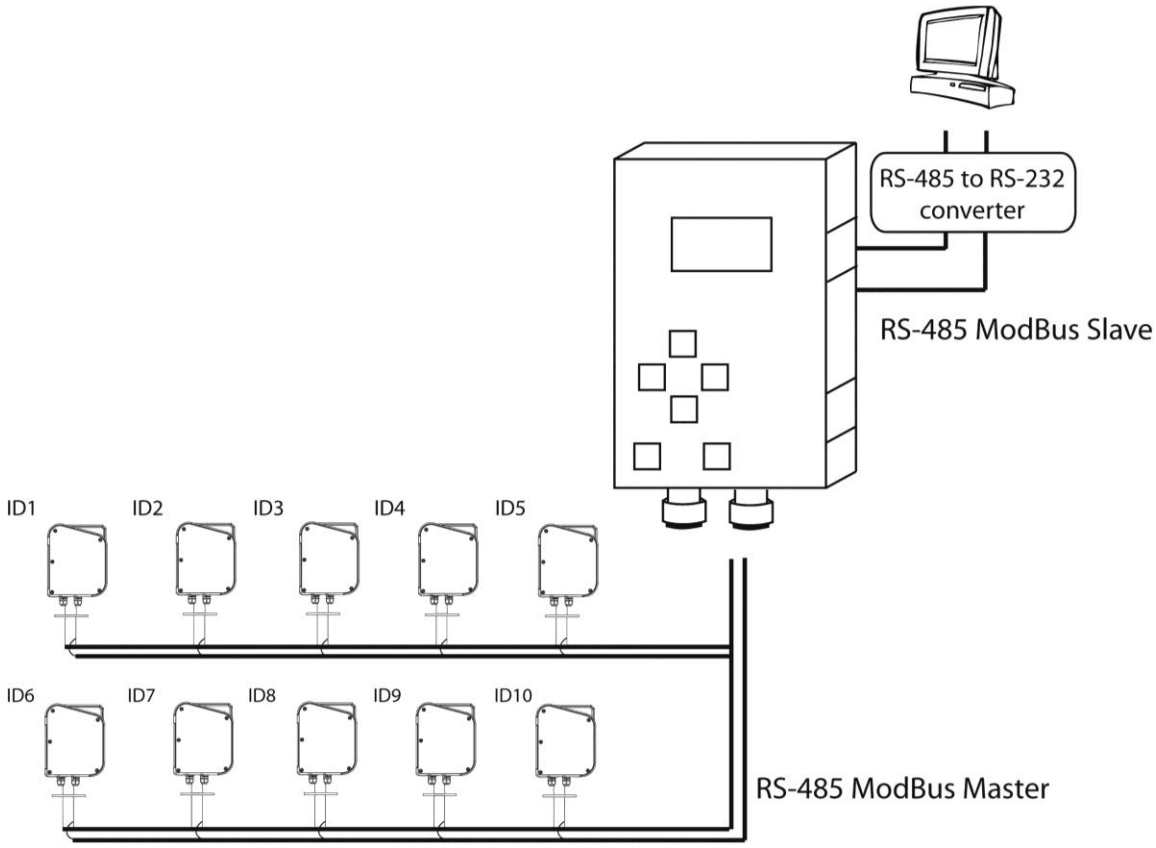


Figure 9: Communication flowchart

Setup & Operational Notes:

1. The RCU can use only one type of sensor communication interface, either RS-485 hardwire or ZigBee wireless, at a time. Remove or eliminate either RS485 wiring or ZigBee if it is not used.

2. When adding a new sensor to the sensor network(s) the hardware needs to be refreshed, DEVICE SCAN, refer to Programing section Figure 6.

3. It is recommended to adjust the SCAN NUMBER program parameter to the specific number of sensors on the network. The default number is 128 units. For example, there are 20 sensors with the highest sensor ID of 032. The recommended SCAN NUMBER is 32. This will shorten the amount of time to scan the network and download all sensor data for each sensor.

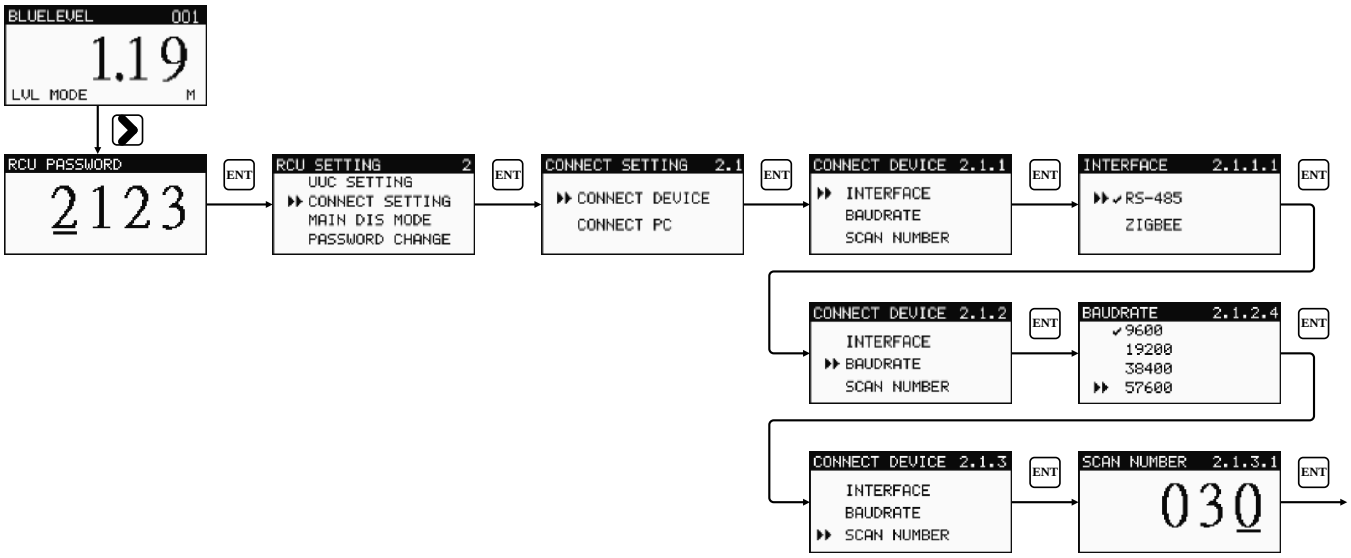
4. The default baudrate of the RCU for the sensor network is 9600. Reducing this baudrate will also reduce the frequency of data refresh by the RCU (4 sensors per main display page).

Setup & Operation Cont'd.

Example Setup:

1. The RCU is desired to connect with twenty (20) Model WC smart inventory sensors with baudrate of 57600 and sensor MODBUS addresses of 010 through 029.
2. You desire to only control fourteen (13) of these sensors, those with MODBUS addresses 010 through 015, 021 through 023 and 026 through 029.
3. You desire to transfer all data received from the sensors to a PC whose MODBUS address is 001 with a baudrate of 9600.

Setup 1 –



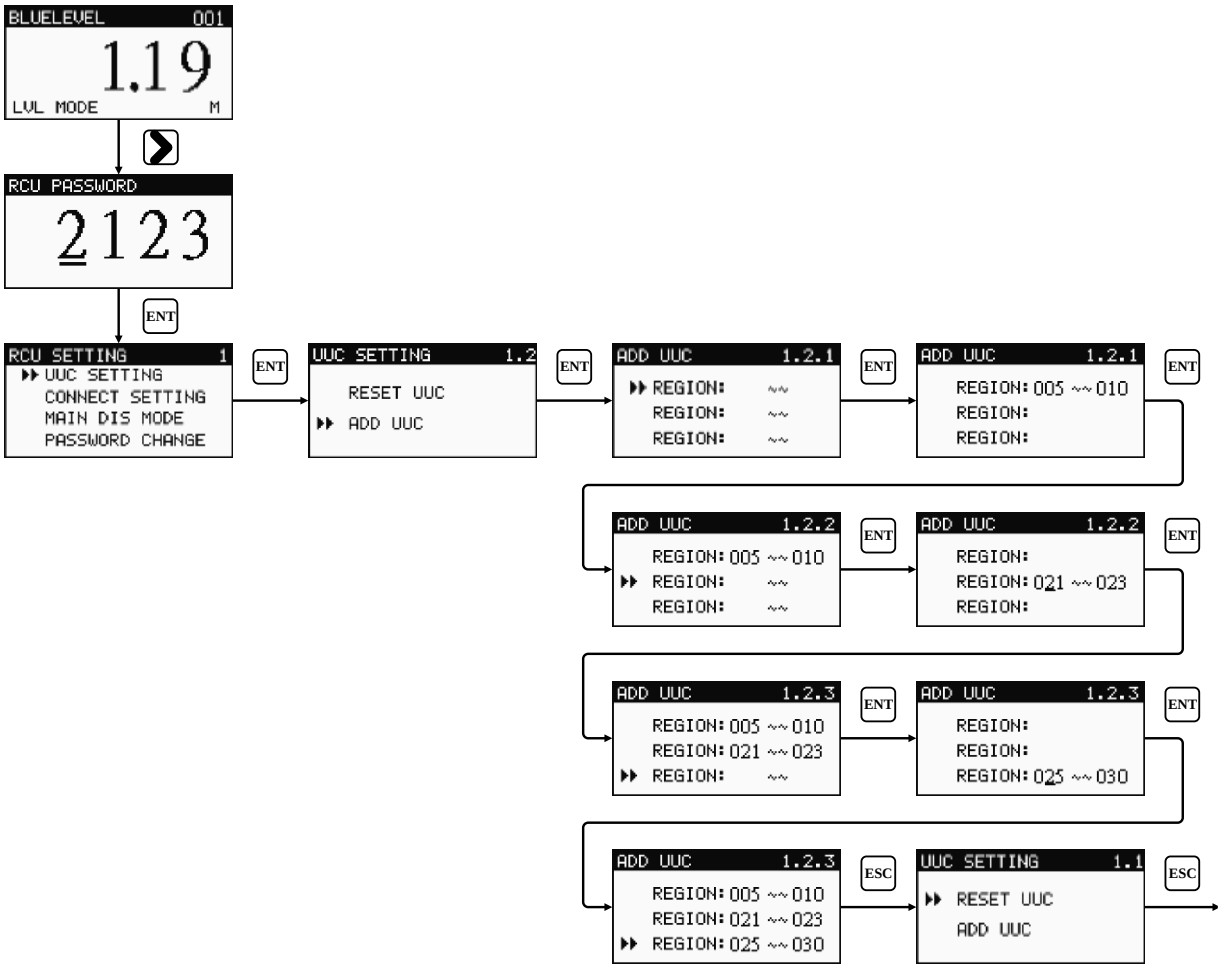
From the main display proceed to the RCU setting menu by pressing the RIGHT arrow key. Enter the password to access the RCU setting menu and press the ENT key. Use DOWN and UP keys to move >> cursor to CONNECT SETTING, then press ENT key to move to and select (using UP and DOWN keys) CONNECT DEVICE, then INTERFACE, then RS-485, BAUDRATE, and select 57600. Press ENT key to CONNECT DEVICE 2.1.3 menu and use UP and DOWN keys to SCAN NUMBER. Use the arrow keys to enter the maximum scan number of 030 (allows for more than the initial 20 sensors to be scanned for future use and additions).

Because this is initial setup you must refresh the hardware by performing a DEVICE SCAN. As shown below, from the main display press the ESC key to enter DEVICE SCAN menu. Use UP and DOWN keys if necessary to select YES, then press the ENT key to allow RCU to scan the connected network.

Setup & Operation Cont'd.

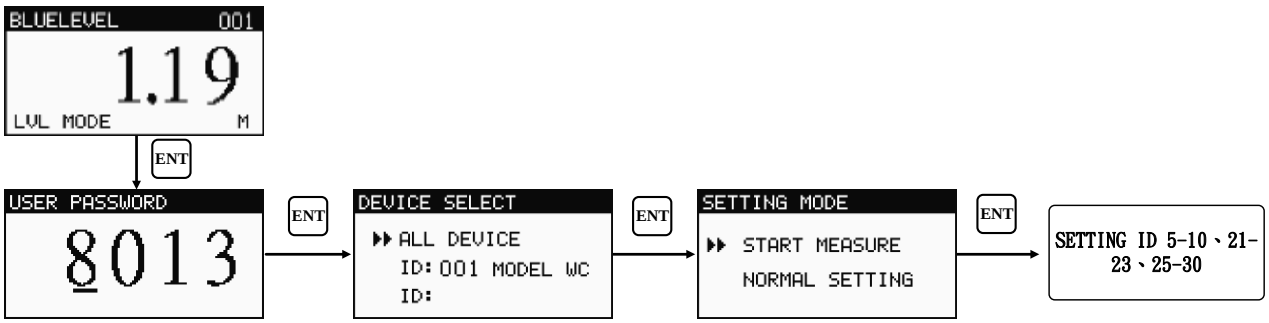
Example Setup Cont'd:

Setup 2 –



From the main display use the ENT, RIGHT, LEFT, UP and DOWN arrow keys to accomplish the setup shown above. Return to the main display by pressing the ESC key until the main display is shown.

Perform a "measure all" by following the below steps using the keys on the RCU.

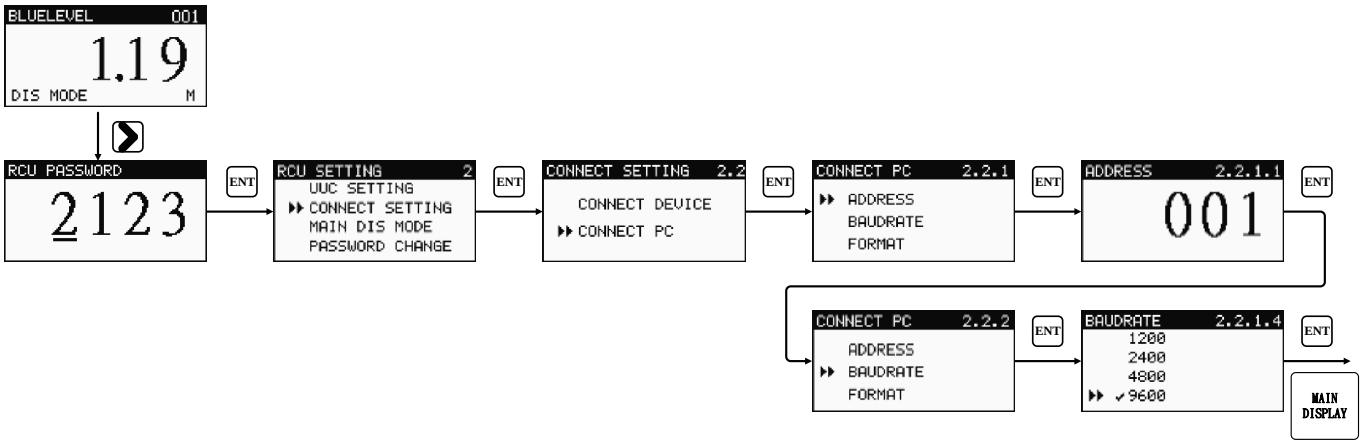


Setup & Operation Cont'd.

Example Setup Cont'd:

Setup 3 –

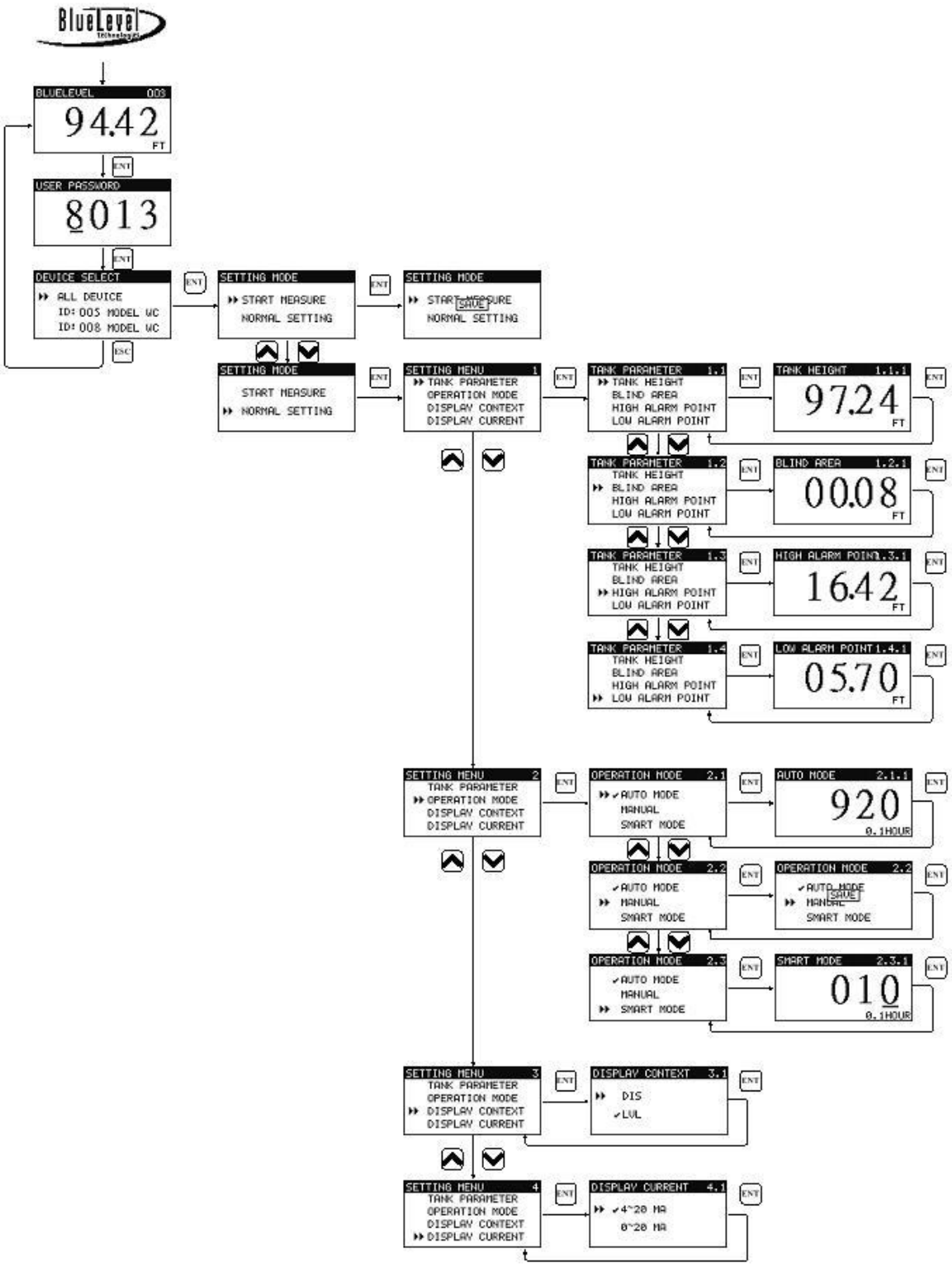
Setup a connection to the PC as shown below using the RCU keys starting from main display.



Operate the MODBUS poll from the PC to establish the connection with the RCU. Contact the factory for MODBUS address table for use with your PC or network software.

Setup & Operation Cont'd.

Use the below RCU operating parameter flowchart to manually initiate sensor measurements of Model WC sensors and to read/update some sensor parameters as shown. Use RCU keys to maneuver/perform tasks.



Maintenance

Preventive Maintenance:

Regularly check the secure assembly of all parts and examine the operation of the RCU.

Troubleshooting:

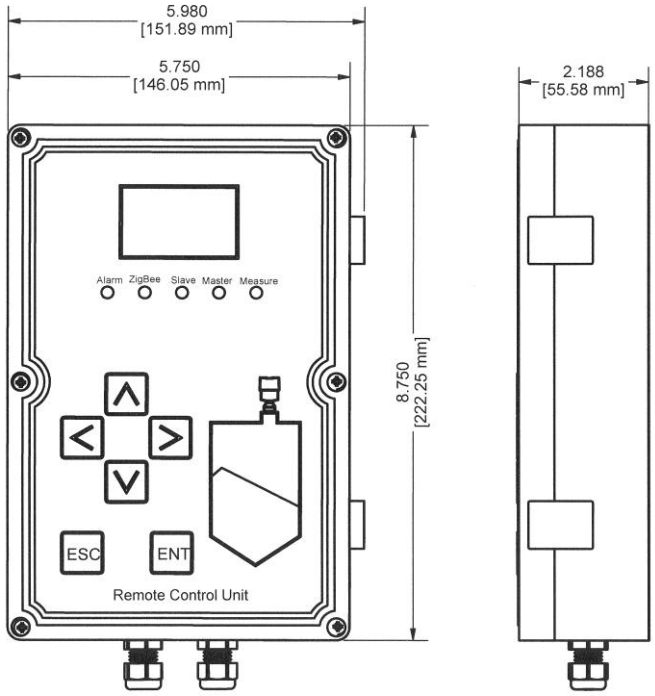
Issue	Possible Cause	Check	Solution
No display No LED's	No power	Check voltage at input	Turn on power
	Broken wire(s)	Check continuity across fuse	Replace wire or provide correct voltage
	Circuit dead		Replace fuse
	Power supply failed		Replace circuit board, contact BlueLevel Technologies
Displaying 00000	No sensor connected	RS-485 wiring disconnected	Connect wiring
	No power to sensor		Power on
	No hardware refresh	Displaying 00000 in main display; ID = 000	Refresh hardware by executing DEVICE SCAN
	Communication module failure		Contact BlueLevel Technologies
	Incorrect communication interface settings	Check consistency and accuracy of settings for RS-485	Ensue settings are correct
RS-485 connection failure with some sensors	Sensor ID has changed or is repeated for multiple sensors	Abnormal sensor ID	Refresh hardware after correcting sensor ID's
	Power failure at sensor	Check sensor	Contact BlueLevel Technologies
	Loose RS-485 wiring at sensor	Check RS-485 wiring at sensor	Correct wiring
Abnormal blinking of LED's or absence of illumination of LED	Connection error or communication break at sensor	"Disconnect" displayed when the RCU scans the sensor ID	Check sensor wiring
	LED(s) not functioning properly	Check to see sensor ID is not 000	Contact BlueLevel Technologies

Technical Data

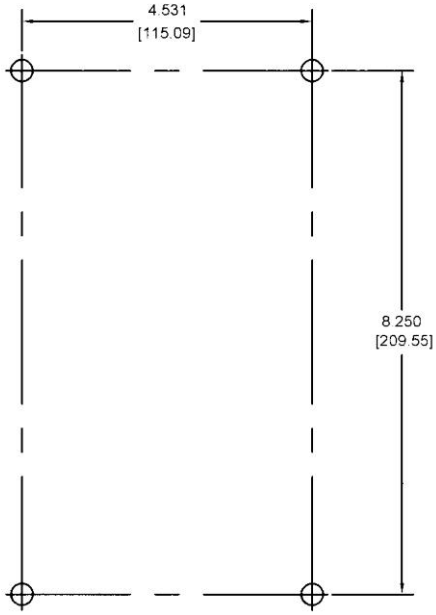
Power Supply:	20-250VAC 50/60Hz / 20-250VDC
Maximum Current:	0.2-0.25A (with 128 sensors connected)
Ambient Temperature:	-40°F to +185°F (-40°C to +85°C)
Process Temperature:	-40°F to +185°F (-40°C to +85°C)
Enclosure:	IP65, Polypropylene
Display:	LCM (liquid crystal display module)
Outputs:	
Serial	(2) RS-485 MODBUS Master (up to 128 sensors each) (1) RS-485 MODBUS Slave (for PC)
Relay	(1) SPDT 3A @ 250VAC (sensor alarm indication)
LED Indicators:	MASTER (indicates activity on RS-485 Master serial line) SLAVE (indicates activity on RS-485 Slave serial line) ZIGBEE (indicates activity when installed and operating) MEASURE (indicates and sensor measurement in process) ALARM (indicates a sensor alarm condition exists)
Keys:	UP, DOWN, LEFT, RIGHT, ENT, ESC
Electrical Entry:	Two (2) Cable Glands
Weight:	1.3lbs (0.6kg)
Certifications:	CE Mark

Dimensions

BASIC DIMENSION



MOUNTING HOLES



Our Commitment Stands

-Golden Parachute:

Each BlueLevel Technologies Model RCU Remote Control Unit is backed by our **Golden Parachute** support program. If you are the initial purchaser and purchased the product directly from BlueLevel Technologies, this provides you with added assurance.

The Golden Parachute support program gives the initial purchaser **90 days to evaluate the product**. Within this time frame if you are not satisfied for any reason, call us and request a "Golden RMA", providing your order details and serial number on the unit, and then return the unit and request a replacement or a credit to your account for the cost of the equipment as shown on your invoice from BlueLevel Technologies. In addition, Model RCU products are covered by our industry-leading 2-year limited warranty. Consult our Warranty statement for details.

Standard Warranty

Each BlueLevel Technologies Model RCU Remote Control Unit is backed by our industry-leading 2-year limited warranty. Should you experience a problem with one of our products deemed by our factory to be a product failure covered by our warranty, for a period of 2-years from the date of shipment we will repair the unit at our factory or provide you with a replacement unit or sub-assembly at our discretion. A return authorization number must be obtained from a BlueLevel Technologies customer service technician BEFORE returning any unit. Refer to the below details for more information.

Details:
We warrant BlueLevel Technologies products to be free from defects in workmanship and materials when operated under normal conditions and in accordance with nameplate characteristic limits. Products must be installed and maintained in accordance with BlueLevel Technologies installation, operation and maintenance instructions. Users are responsible for the suitability of the products to their application. There is no warranty against damage resulting from misapplication, improper specifications, or other operating conditions beyond our control. Claims against carriers for damage in transit must be filed by the buyer.

This warranty shall be in effect for a period of twenty-four months from the date of shipment. THIS WARRANTY SHALL BE IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. BlueLevel Technologies will repair or replace, at its option, any product which has been found to be defective and is within the warranty period, provided that the product is shipped, with previous factory authorization, freight prepaid, to the factory in Rock Falls, Illinois, U.S.A., or to the nearest service station. BlueLevel Technologies is not responsible for removal, installation, or any other incidental expenses incurred in shipping the products to or from BlueLevel Technologies. BlueLevel Technologies' liability under this warranty shall be solely limited to repair or replacement of the products within the warranty period, and BlueLevel Technologies shall not be liable, under any circumstances, for consequential or incidental damages, including, but not limited to, personal injury or labor costs. Under no circumstances will BlueLevel Technologies be responsible for any expense in connection with any repairs made by anyone other than the factory or an authorized service station, unless such repairs have been specifically authorized in writing.

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