

The ULC-351 is a 3G/4G SMS alarm kit that can be used to trigger custom messages for remote monitoring of equipment. By default, this unit is factory set for the first 16 channels to be Coils, and the next 16 channels to be Holding Registers. The device can accommodate up to 64 channels, where the user is free to configure the remaining available channels. Text messages are easily set by the user using a web browser and can be triggered by the Modbus data registers. More details on user settings can be found on the Appendix below.

### **Modbus Registers and Channels**

Coil	Channel	Туре
Address		
0	СНО	Coil
1	CH1	Coil
2	CH2	Coil
3	СНЗ	Coil
4	CH4	Coil
5	CH5	Coil
6	CH6	Coil
7	CH7	Coil
8	CH8	Coil
9	CH9	Coil
10	CH10	Coil
11	CH11	Coil
12	CH12	Coil
13	CH13	Coil
14	CH14	Coil
15	CH15	Coil

Register Address	Channel	Туре
0	CH16	Holding Register
1	CH17	Holding Register
2	CH18	Holding Register
3	CH19	Holding Register
4	CH20	Holding Register
5	CH21	Holding Register
6	CH22	Holding Register
7	CH23	Holding Register
8	CH24	Holding Register
9	CH25	Holding Register
10	CH26	Holding Register
11	CH27	Holding Register
12	CH28	Holding Register
13	СН29	Holding Register
14	СНЗО	Holding Register
15	СН31	Holding Register



### **Alarm Settings:**

All Coils have been pre-configured to send out a SMS when the output is HIGH (TRUE). For example, when CH5 Coil is HIGH, the SMS will say "CH5 is HIGH".

All Holding Registers have been pre-configured to send out a SMS when the current value greater than (>) 0. For example, when CH25 goes from a value of 0 to 10, the SMS will say "CH25 holds 10"

The phone numbers for the SMS alarms can be added by Ocean Controls prior to shipment, or the user may configure it as they wish. More details can be found on the Appendix below.

### **RS-485 Modbus Communication Parameters:**

By default, the ULC-351 communicates with these settings:

Modbus Default Parameter	Modbus Default Parameter Value
Slave ID	1
Baud Rate	9600
Parity	None
Stop bit	1



# **Appendix:**

## **Quick Start**

Install your SIM card(s) in the ULC-035 by removing the small screw and sliding away the side cover. You will find this screw adjacent to the power terminals. Only one SIM card is necessary, but two can be used to provide redundancy.



Attach at least one antenna to the ULC-035. The provided antenna is adequate for most situations.

Connect both devices via RS-485. Shielded cable is preferred, but any will suffice over a short distance. 'A' goes to 'DATA+' and 'B' goes to 'DATA-'.

Device	RS-485 Terminals
ULC-035	A and B
Modbus Slave Unit	DATA+ and DATA-

Apply power to both devices. They can both share the same power supply if they have a similar range. POWER LED illuminates on the ULC-035 (among others).

Device	Power Terminals
ULC-035	+ and -
Modbus Slave Unit	+VS and GND



Connect a computer via the included Ethernet cable to any port among LAN1-LAN4 on the ULC-035. The default IP address is:

# 192.168.1.1

If you are on this subnet, you should be able to enter 192.168.1.1 in your web browser and be served out the configuration page.

For more information, including changing your subnet on Windows, see the ULC-035 user manual (page 13).

You will be greeted with a login screen. Default username: *admin* Default password: *password* 



# **Router Configuration**

Most of the control has already been set up in the factory, but you will need to add your own phone number(s), and optionally change the SMS alarm message.

#### • Configure the Cellular Connection

Click on "Network" -> "Interface" -> "Cellular" to configure the cellular setting.

Enable SIM1 (and SIM2), and set "Network Type" to "Auto". Enter the corresponding SMS centre number for your cellular.

Carrier	SMS Centre Number
Telstra	+61418706700
Optus	+61411990001
Vodafone	+61415011501

Enter APN for your cellular. E.g. APN for Telstra Sim, "telstra.extranet"

Click "Save" and "Apply" to update the changes to ULC-035.

Status	Port	WAN	Bridge	Switch	Cellu	ular	Loopback	
Network 🔻	Cellular Setti	ings						
Interface	Enable		SIM1			SIM2		
Firewall	Network Type		Auto		$\sim$	Auto		$\sim$
QoS	APN							
DHCP	Username							
DONO	Password							
DDNS	Access Numbe	er						
Link Failover	PIN Code							
Routing	Authentication	Туре	Auto		$\sim$	Auto		$\sim$
VPN	Roaming							
	SMS Center		+6141	8706700				
System •	Connection Se	etting	$\geq$					
	Dual SIM Strat	egy	$\geq$					
Industrial 🕨 🕨	Enable NAT		$\checkmark$					
M-:	Restart When I	Dial-up Fails						
Maintenance	ICMP Server		8.8.8	}				
APP •	Secondary ICM	IP Server	114.11	4.114.114				
	ICMP Detection	n Max Retries	3					
	ICMP Detection	n Timeout	5		S			
	ICMP Detection	n Interval	15		S			



#### • Adding/Changing Phone Numbers

Navigate to "System -> General Settings -> Phone" using the left side menu.

Add phone numbers to the "Phone Number List". In "Phone Group List", create a phone group and select phone numbers. Multiple numbers can be grouped together such that more than one person is notified of an alarm. Different groups can even be created and assigned to different alarms.

Click "Save" and "Apply" to finalize your update.

Status	General	System Time	SMTP	Phone	SMS	Email	Storage
Network 🕨	Phone Nu	nber List					
System 🔻		Number			Description		Operation
General Settings		+6112345678					×
							+
User Management	Phone Gro	oup List					
SNMP		Group ID		1			
AAA		Description	n	Test			
Device Management		List	^	+61	Selected 12345678	^	
Events				<u>&gt;</u>			
Industrial 🕨 🕨			~	<u>«</u>		~	
Maintenance 🕨			Save	Cancel			
		_					

#### • Serial Port Setup

Under "Industrial" section, enable "Serial Port 2" for communicating via RS485. Choose the required values for the communication parameter. For example:

- o Baud Rate: 9600
- Data Bits: 8 bits
- Stop Bits: 1 bit
- Parity: None

Set "Serial Mode" to be "Modbus Master", then "Save" and "Apply" all configuration.

	ULC	C-351 Modbus to	3G/4G SMS A	larm Controller
Status	Serial1	Serial 2		
Network 🕨	Serial Settings			
System 🕨	Enable Serial Type	RS485	~	
Industrial 🔻	Baud Rate Data Bits	9600 8bits	~	
I/O	Stop Bits	1bits	~	
Serial Port	Parity	None	$\sim$	
Modbus Slave	Software Flow Contr Serial Mode	ol Modbus Master	~	
Modbus Master	Save			
GPS				

Go to "Modbus Master -> Modbus Master", enable "Modbus Master Setting" and Set up preferred values for the Modbus Master's parameters. Remember to press "Save & Apply".

Status	Modbus Master	Channel		
Network 🕨	Modbus Master Setting			
	Enable	$\checkmark$		
System	Read Interval	5		s
	Max. Retries	3		
Industrial	Max. Response Time	500		ms
I/O	Execution Interval	50		ms
Serial Port	Channel Name	DI0	~	Read
Modbus Slave	Save & Apply			
Modbus Master				

### • Create Channels & Set up Alarm

Click on "Industrial -> Modbus Master->Channel", add channels and configure alarm setting on this page.

Name	Set the name to identify the remote channel. It cannot be blank
Slave ID	Address of Modbus Slave unit
Address	The starting address for reading
Number	The length of registers this channel will contain
Туре	Read command, options are "Coil", "Discrete", "Holding Register
	(INT16)", "Input Register (INT16)", "Holding Register (INT32)"
	and "Holding Register (Float)".

In "Channel Setting", fill up information for each channel, where

Ce/	IN_					U	<b>_C-35</b> 2	1 M	odbus t	o 3G	/4G S	MS A	Alarm (	Contro
LUNT	Link		Seria	l 2										
Channel	Setting												Docimal	
N	lame	Slave ID	Address	Number	Ty	pe	Link	_	IP Address	_	Port	Sign	Place	Operation
D10		1	0	1	Coil	$\sim$	Serial 2	$\sim$					0	×
DI1		1	1	1	Coil	$\sim$	Serial 2	~					0	×
DI2		1	2	1	Coil	$\sim$	Serial 2	~					0	×

In "Alarm Setting", set up the alarm for each channel. You can add up to 64 Modbus channels.

If you click on the "pen" icon on each one, a box will appear with the alarm settings. Towards the bottom of the box there is a text box called "Abnormal Content "and this is the message you will receive when the set condition is met. By default, the SMS is a detailed message with time, condition, and current status of the channel. These messages can be altered to say something more descriptive for your application, EG "pump room 4 VFD fault", or "Eastern Chook shed under temperature."

Alarm Setting			
	Name	DI0	$\sim$
	Condition	TRUE	$\sim$
	Alarm	SMS Email	
	Phone Group	1	$\sim$
	Normal Content	Note: \$YEAR/\$MON/\$DAY \$TIME, get NORMAL data \$VALUE from address \$ADDRESS of channel \$NAME. (Abnormal scope is \$CONDITION)	
	Abnormal Content	Note: \$YEAR/\$MON/\$DAY \$TIME, get ABERRANT data \$VALUE from address \$ADDRESS of channel \$NAME. (Abnormal scope is \$CONDITION)	
	Continuous Alarm		
	Save	Cancel	

Once you have finished all changes, press "Save" and "Apply".

Your equipment is now ready.