

EMS702V0-R00

Street Light

Controller and Event Logger

User Manual

This document applies to Product	9001-0153
Build Version	3600-0218
Firmware Version	5000-0462

Version History:

S. No.	Version No.	Changes Made	Date Modified	Modified By	Approved By
1					
2					
3					

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EMS702V0-R00s

Street Light Controller and Event Logger

1. Introduction

The EMS702V0 is a street light controller and event logger. The unit is intended to monitor the Mains Power conditions, site security and has an output to control the street lights.

The unit logs AMF reasons, 3 phase volts and amps, neutral amps, frequency, 3 phase KW, KWH, PF, schedule for current month, On/Off hours and minutes. The collected data is automatically transferred to a central server via GPRS connectivity, where warnings, alarms and site performance data can be collected and analysed for reporting purposes.

The street lights can be turned on/off via the SMS.

The unit is intended to be fitted into an enclosure so that it provides a ready to use solution.

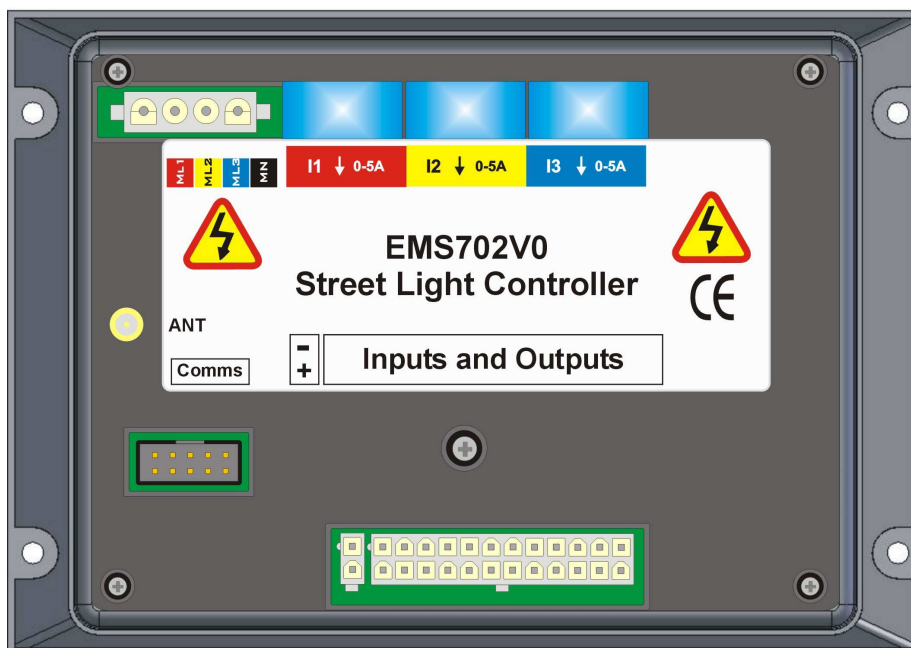
2. Benefits

- Provides comprehensive real time knowledge of the infrastructure to ensure maximum availability.
- Improves service management and reliability.
- Provides automatic SMS messages to local service providers in the event of site failure.
- Reduces the overall operating costs.

3. Physical Form



Front View



Rear View

4. Functions

4.1 Monitoring

Function	Description
Mains Availability	Logs mains availability.
Warnings and Alarms	Logs all warnings and alarms. Selectable SMS messaging on alarms.

4.2 Digital Input

Function	Description
Digital Input	General purpose digital input is provided to allow remote status detection of connected input.

4.3 Digital Output

Function	Description
Street Light control	Output to control the street lights.

5. Operation



Front Layout

5.1 Buttons

Button	Function Description
	Menu Previous Used as system menu previous button
	Menu Next Used as system menu next button
	Setup Menu Entry Used to enter the Setup mode
	Screen Scroll up / Setup menu up Button - Screen Scroll up Button - Used as the system menu up and value increment button
	Screen Scroll down / Setup menu down Button - Screen Scroll up - Used as the system menu down and value decrement button

5.2 LEDs

Button	Function Description
 Alarm	Alarm Indicates system alarm

5.3 Initial Power Up

On power up, the unit displays the Logo.

The unit then displays the Serial number, Application Code and Firmware version.

Once initialisation process is complete, the unit displays the status of street lights.

The unit remains on for 1 minute and if no button is pressed, it goes into sleep mode to conserve battery.

6. Display Operation

6.1 When the unit is on:

Screen - 1

RMS
V4.AL.0C

Screen – 2

LIGHTING STATUS
On =18:30
Off =06:30
Status =Off

Screen – 3

MAIN	VOLTS	AMPS
R	0	00
Y	0	00
B	0	00

Screen - 4

MAIN	HERTZ
R	00
Y	00
B	00

Screen – 5

MAIN	KW	PF
R	+ 0.0	+1.0
Y	+ 0.0	+1.0
B	+ 0.0	+1.0

Screen – 6

MAIN	KWHours
	000000000
Neutral I	0.0A

Screen – 7

	Clock
	17:55:55
	06/Jan/2000

7. Alarms

Alarms are indicated by fast flashing of the ALARM LED and displaying the appropriate message on the bottom LCD. It also sends the alarm messages as a SMS to configurable cell numbers.

Message	Function description
Neutral Amps	If the neutral Amp is above its set point it is an alarm.
Digital Input	The Digital input was activated.

8. Inputs Electrical Specification

Input	Type	Comment
Battery + Volts	Power	Nominal 12VDC or 24VDC or Station Battery Supply Max 36VDC
0V Common	Power	0VDC, Common
Input I/P1	Digital	Suitable for switch input. Becomes active when closed to 0V

9. Outputs Electrical Specification

Output	Type	Comment
Street Light control	Open Drain	300mA Open Drain protected coil drive. Max 32VDC This output is used to control status of street lights

10. Navigating in the setup menu

The setup menu comprises a range of columns where each column comprises of a list of items and each item has a range of settable values.

Column Headings are as follows.

System	AC Setup	AMF Setup	Logging	RTC OP January	RTC OP February	RTC OP March
RTC OP April	RTC OP May	RTC OP June	RTC OP July	RTC OP August	RTC OP September	RTC OP October
RTC OP November	RTC OP December	Comms	SMS Phone Num1	SMS Phone Num2	SMS Phone Num3	SMS Phone Num4
SMS Phone Num5	Server SMS	Server Address	Server Port	Storage URL	APN	APN User
APN Pass	Latitude	Longitude	Date and Time			



The button is used to select the previous column, Item, or to increment a value.



The button is used to select the next column, item, or to decrement a value.



The button changes from Column to item to value editor.



The button changes from Item to column and exit setup mode.



The button is used to accept value changes.

Setup mode automatically terminates if no button is pressed for 60 seconds, or when you

press the  button with the column headers list visible.

10.1 System Column

Item	Range	Default	Description
Contrast	0 - 11	4	LCD Contrast
Disp Update	OFF 2 – 60 sec	3	Display Cycle Time, sets frequency of display update. If set to Off, display scrolling is disabled. For manual scrolling press  button for previous measurement screen and  button for next measurement screen.
Disp Hold	5 – 60 sec	30	Display hold time. Sets the duration of display hold when the alarm button is pressed to halt the scrolling
LCD Reverse	No Yes Cycle	Cycle	No = LCD is adjusted to work best in daylight Yes = LCD is adjusted to work best at night Cycle = LCD Day and Night Adjustments are cycled
Custlogo	No Yes	Yes	Yes = Show Customer Logo No = Don't show Customer Logo
Site ID	0 – 30000	0	Site Identifier. May also be used for asset numbering.
Defaults	NO YES	NO	Setting to Yes will load all configuration items to their factory default values. Note: Engine calibration will be lost.

10.2 AC Setup Column

Item	Range	Default	Description
VPhases	1-3	1	1 = Single phase operation L1-N 2 = Two Phase operation. L1 – L2 3 = Three Phase operation L1 – L2, L2 – L3, L3 – L1.
CT Ratio	1 – 2000	12	CT ratio. 12 means 60 amps in, 5 amps out.
Nue Amp	1 - 20	2	The maximum neutral Amp above which it is considered as a fault.
Phase Rev	OFF ON	ON	Sets Phase reversal checking. OFF = Phase reversal checking is disabled. (1 and 2 Phase) ON = Phase reversal checking of UB mains is active.(3 Phase)

10.3 AMF Setup

Item	Range	Default	Description
Low Volt Trip	60 – 240 Volts	185	The minimum voltage below which the Genset is started
Hi Volt Trip	110 – 300 Volts	270	The maximum voltage above which the Genset is started
Lo Hz Trip	40 – 60 Hz	45	The minimum frequency below which the Genset is started.
Hi Hz Trip	50 – 70 Hz	55	The maximum frequency above which the Genset is started.
Stable Tm	0 – 10 seconds	3	The duration of a Mains failure event required initiate an AMF Delay.
Restore Tm	0 – 255 seconds	3	The time of mains normal condition required to reset the AMF delay
Delay Sec	0 – 59 seconds	5	The delay for activation of an AMF event causing the Genset to start in seconds.

10.4 Logging

Item	Range	Default	Description
LogTime	1-1000M	1M	It is the time set the by user for data logging.

10.5 RTC OP January

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.6 RTC OP February

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.7 RTC OP March

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.8 RTC OP April

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.9 RTC OP May

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.10 RTC OP June

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.11 RTC OP July

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.12 RTC OP August

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.13 RTC OP September

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.14 RTC OP October

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.15 RTC OP November

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.16 RTC OP December

Item	Range	Default	Description
On Hour	0-23H	18H	Configurable time for turning on the street light Ex: Turning street light on at 18.30.
On Minute	0-59M	30M	Configurable time for turning on the street light
Off Hour	0-23H	6H	Configurable time for turning off the street light Ex: Turning street light off at 6.30.
Off Minute	0-59M	30M	Configurable time for turning off the street light

10.17 Comms (Communications) Setup Column

Item	Range	Default	Description
Comms ID	1 - 240	118	Comms Address. Required for remote communications
Baud Rate	1200 2400 4800 9600 19200 38400 57600	9600	Comms Port Baud Rate
Data Bits	7 – 9	8	Number of Data Bits
Parity	Even Odd None	None	Parity Select
Stop Bits	1 or 2	1	Number of Stop Bits
UART Mode	None Modem	None	RS232 Handshaking Mode None = No RTS/CTS control. 3 wire connection. Modem = Uses RTS/CTS flow control. 5 wire connection.
Modem Dial	OFF 1 - 5	Off	Allocates the phone number for alarm dial out

10.18 SMS Phone Number 1 Column.

Item	Range	Default	Description
SMSPH Dig 1	0 – 9	0	“0 – 9” = Numerical part of a phone number “END” = digit not used “+” = Used to get an international dial tone “ ” = Used to get a delay when a Pager system is used instead of SMS system
SMSPH Dig2	END	2	
SMSPH Dig3	+	1	
SMSPH Dig4		0	
SMSPH Dig5		2	
SMSPH Dig6		9	
SMSPH Dig7		7	
SMSPH Dig8		0	
SMSPH Dig9		6	
SMSPH Dig10		9	
SMSPH Dig11		7	
SMSPH Dig12		END	
SMSPH Dig13		END	
SMSPH Dig14		END	
SMSPH Dig15		END	
SMSPH Dig16		END	
SMSPH Dig17		END	
SMSPH Dig18		END	
SMSPH Dig19		END	
SMSPH Dig20		END	
SMSPH Dig21		END	
SMSPH Dig22		END	
SMSPH Dig23		END	
SMSPH Dig24		END	

10.19 SMS Phone Number 2 Column.

Item	Range	Default	Description
SMSPh Dig 1	0 – 9 END +	END	“0 – 9” = Numerical part of a phone number “END” = digit not used “+” = Used to get an international dial tone “ ” = Used to get a delay when a Pager system is used instead of SMS system
SMSPh Dig2		END	
SMSPh Dig3		END	
SMSPh Dig4		END	
SMSPh Dig5		END	
SMSPh Dig6		END	
SMSPh Dig7		END	
SMSPh Dig8		END	
SMSPh Dig9		END	
SMSPh Dig10		END	
SMSPh Dig11		END	
SMSPh Dig12		END	
SMSPh Dig13		END	
SMSPh Dig14		END	
SMSPh Dig15		END	
SMSPh Dig16		END	
SMSPh Dig17		END	
SMSPh Dig18		END	
SMSPh Dig19		END	
SMSPh Dig20		END	
SMSPh Dig21		END	
SMSPh Dig22		END	
SMSPh Dig23		END	
SMSPh Dig24		END	

10.20 SMS Phone Number 3 Column.

Item	Range	Default	Description
SMSPH Dig 1	0 – 9 END +	END	“0 – 9” = Numerical part of a phone number “END” = digit not used “+” = Used to get an international dial tone “ ” = Used to get a delay when a Pager system is used instead of SMS system
SMSPH Dig2		END	
SMSPH Dig3		END	
SMSPH Dig4		END	
SMSPH Dig5		END	
SMSPH Dig6		END	
SMSPH Dig7		END	
SMSPH Dig8		END	
SMSPH Dig9		END	
SMSPH Dig10		END	
SMSPH Dig11		END	
SMSPH Dig12		END	
SMSPH Dig13		END	
SMSPH Dig14		END	
SMSPH Dig15		END	
SMSPH Dig16		END	
SMSPH Dig17		END	
SMSPH Dig18		END	
SMSPH Dig19		END	
SMSPH Dig20		END	
SMSPH Dig21		END	
SMSPH Dig22		END	
SMSPH Dig23		END	
SMSPH Dig24		END	

10.21 SMS Phone Number 4 Column.

Item	Range	Default	Description
SMSPH Dig 1	0 – 9 END +	END	“0 – 9” = Numerical part of a phone number “END” = digit not used “+” = Used to get an international dial tone “ ” = Used to get a delay when a Pager system is used instead of SMS system
SMSPH Dig2		END	
SMSPH Dig3		END	
SMSPH Dig4		END	
SMSPH Dig5		END	
SMSPH Dig6		END	
SMSPH Dig7		END	
SMSPH Dig8		END	
SMSPH Dig9		END	
SMSPH Dig10		END	
SMSPH Dig11		END	
SMSPH Dig12		END	
SMSPH Dig13		END	
SMSPH Dig14		END	
SMSPH Dig15		END	
SMSPH Dig16		END	
SMSPH Dig17		END	
SMSPH Dig18		END	
SMSPH Dig19		END	
SMSPH Dig20		END	
SMSPH Dig21		END	
SMSPH Dig22		END	
SMSPH Dig23		END	
SMSPH Dig24		END	

10.22 SMS Phone Number 5 Column.

Item	Range	Default	Description
SMSPH Dig 1	0 – 9 END +	END	“0 – 9” = Numerical part of a phone number “END” = digit not used “+” = Used to get an international dial tone “ ” = Used to get a delay when a Pager system is used instead of SMS system
SMSPH Dig2		END	
SMSPH Dig3		END	
SMSPH Dig4		END	
SMSPH Dig5		END	
SMSPH Dig6		END	
SMSPH Dig7		END	
SMSPH Dig8		END	
SMSPH Dig9		END	
SMSPH Dig10		END	
SMSPH Dig11		END	
SMSPH Dig12		END	
SMSPH Dig13		END	
SMSPH Dig14		END	
SMSPH Dig15		END	
SMSPH Dig16		END	
SMSPH Dig17		END	
SMSPH Dig18		END	
SMSPH Dig19		END	
SMSPH Dig20		END	
SMSPH Dig21		END	
SMSPH Dig22		END	
SMSPH Dig23		END	
SMSPH Dig24		END	

10.23 Server SMS

Item	Range	Default	Description
TYPE	Any Server	Any	Any = SMS from any phone number will be actioned. Server = SMS from phone numbers which are on the list will be actioned.
SMSPH Dig 1	0 – 9 END +	END	“0 – 9” = Numerical part of a phone number “END” = digit not used “+” = Used to get an international dial tone “ ” = Used to get a delay when a Pager system is used instead of SMS system
SMSPH Dig2		END	
SMSPH Dig3		END	
SMSPH Dig4		END	
SMSPH Dig5		END	
SMSPH Dig6		END	
SMSPH Dig7		END	
SMSPH Dig8		END	
SMSPH Dig9		END	
SMSPH Dig10		END	
SMSPH Dig11		END	
SMSPH Dig12		END	
SMSPH Dig13		END	
SMSPH Dig14		END	
SMSPH Dig15		END	
SMSPH Dig16		END	
SMSPH Dig17		END	
SMSPH Dig18		END	
SMSPH Dig19		END	
SMSPH Dig20		END	

SMSPH Dig21		END	
SMSPH Dig22		END	
SMSPH Dig23		END	
SMSPH Dig24		END	

10.24 Server-Addr

Item	Range	Default	Description
SA1	0,1,2,3,4,5, 6,7,8,9,a,b,c ,d,e,f,g,h,i,j, k,l,m,n,o,p, q,r,s,t,u,v,w ,x,y,z,.- ,END	e	0,1,2,3,4,5,6,7,8,9= Numerical part of a IP address a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z =Alphabetical part of a URL address . = Character part of Server address and URL address - = Character part of URL address END= digit not used
SA2		m	
SA3		s	
SA4		-	
SA5		n	
SA6		z	
SA7		.	
SA8		n	
SA9		o	
SA10		-	
SA11		i	
SA12		p	
SA13		.	
SA14		b	
SA15		i	
SA16		z	
SA17		END	
SA18		END	
SA19		END	
SA20		END	
SA21		END	

SA22		END	
SA23		END	
SA24		END	
SA25		END	
SA26		END	
SA27		END	
SA28		END	
SA29		END	
SA30		END	
SA31		END	

10.25 Server Port

Item	Range	Default	Description
Port	1-30000	80	TCP Port for communication.

10.26 Storage URL

Item	Range	Default	Description
SU1	0,1,2,3,4,5, 6,7,8,9,a,b,c ,d,e,f,g,h,i,j, k,l,m,n,o,p, q,r,s,t,u,v,w ,x,y,z,A,B,C, D,E,F,G,H,I,J ,K,L,M,N,O, P,Q,R,S,T,U, V,W,X,Y,Z,,- ,/,END	/	0,1,2,3,4,5,6,7,8,9= Numerical part of a IP address a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z =Lower case alphabetical part of a URL address A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z =Upper case alphabetical part of a URL address . = Character part of Server address and URL address - = Character part of URL address / = Character part of URL address END= digit not used
SU2		D	
SU3		a	
SU4		t	
SU5		a	
SU6		L	
SU7		o	
SU8		g	
SU9		g	
SU10		e	
SU11		r	

SU12		/	
SU13		A	
SU14		P	
SU15		I	
SU16		S	
SU17		t	
SU18		o	
SU19		r	
SU20		e	
SU21		D	
SU22		a	
SU23		t	
SU24		a	
SU25		.	
SU26		p	
SU27		h	
SU28		p	
SU29		END	
SU30		END	
SU31		END	
SU32		END	
SU33		END	
SU34		END	
SU35		END	
SU36		END	
SU37		END	
SU38		END	
SU39		END	

SU40		END	
SU41		END	
SU42		END	
SU43		END	
SU44		END	
SU45		END	
SU46		END	
SU47		END	
SU48		END	
SU49		END	

10.27 APN

Item	Range	Default	Description
APN1	0,1,2,3,4,5,6,7,8,9,a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z,.,-,END	i	0,1,2,3,4,5,6,7,8,9= Numerical part of a APN address a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z = Alphabetical part of a APN address. . = Character part of APN address - = Character part of APN address END= digit not used
APN2		n	
APN3		t	
APN4		e	
APN5		r	
APN6		n	
APN7		e	
APN8		t	
APN9		END	
APN10		END	
APN11		END	
APN12		END	
APN13		END	
APN14		END	
APN15		END	

APN16		END	
APN17		END	
APN18		END	
APN19		END	
APN20		END	
APN21		END	
APN22		END	
APN23		END	
APN24		END	
APN25		END	
APN26		END	
APN27		END	
APN28		END	
APN29		END	
APN30		END	
APN31		END	

10.28 APN User

Item	Range	Default	Description
User1	0,1,2,3,4,5,6,7,8,9,a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z,-,.,-,END	n	0,1,2,3,4,5,6,7,8,9= Numerical part of an username. a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z = Alphabetical part of an username. . = Character part of an username - = Character part of an username END= digit not used
User2		o	
User3		n	
User4		e	
User5		END	
User6		END	
User7		END	
User8		END	
User9		END	

User10		END	
User11		END	
User12		END	
User13		END	
User14		END	
User15		END	
User16		END	
User17		END	
User18		END	
User19		END	
User20		END	
User21		END	
User22		END	
User23		END	
User24		END	
User25		END	
User26		END	
User27		END	
User28		END	
User29		END	
User30		END	
User31		END	

10.29 APN Pass

Item	Range	Default	Description
Pass	0,1,2,3,4,5 ,6,7,8,9,a, b,c,d,e,f,g, h,i,j,k,l,m, n,o,p,q,r,s, t,u,v,w,x,y ,z,.,-,END	n	0,1,2,3,4,5,6,7,8,9= Numerical part of a password a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z = Alphabetical part of a password . = Character part of a password - = Character part of a password END= digit not used
Pass		o	
Pass		n	
Pass		e	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	

Pass		END	
Pass		END	
Pass		END	
Pass		END	
Pass		END	

10.30 Latitude

Item	Range	Default	Description
Lat1	0,1,2,3,4,5 ,6,7,8,9,.,+ ,-,END	-	0,1,2,3,4,5,6,7,8,9= Numerical part of a password a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z = Alphabetical part of a password . = Character part of a password - = Character part of a password + = Character part of a password END= digit not used
Lat2		3	
Lat3		6	
Lat4		.	
Lat5		9	
Lat6		0	
Lat7		6	
Lat8		5	
Lat9		6	
Lat10		3	
Lat11		END	
Lat12		END	
Lat13		END	
Lat14		END	
Lat15		END	

10.31 Longitude

Item	Range	Default	Description
Long1	0,1,2,3,4,5 ,6,7,8,9,.,+ ,-,END	+	0,1,2,3,4,5,6,7,8,9= Numerical part of a password a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z = Alphabetical part of a password . = Character part of a password - = Character part of a password + = Character part of a password END= digit not used
Long2		1	
Long3		7	
Long4		4	
Long5		.	
Long6		6	
Long7		6	
Long8		0	
Long9		7	
Long10		6	
Long11		7	
Long12		END	
Long13		END	
Long14		END	
Long15		END	

10.32 Date and Time

Item	Range	Default	Description
Hour	0-23	1	Set the hours in data logger.
Minute	0-59	6	Set the Minutes in data logger
Second	0-59	14	Set the Seconds in data logger
Day	1-28	2	Set the Day in data logger
Month	Jan, Feb, Mar, Apr, May, Jun, July, Aug, Set, Oct, Nov, Dec.	Jan	Set the Month in data logger
Year	2000- 3000	2000	Set the Year in data logger
Week Day	Sun, Mon, Tue, Wed, Thr, Fri, Sat	Wed	Set the Week Day in data logger

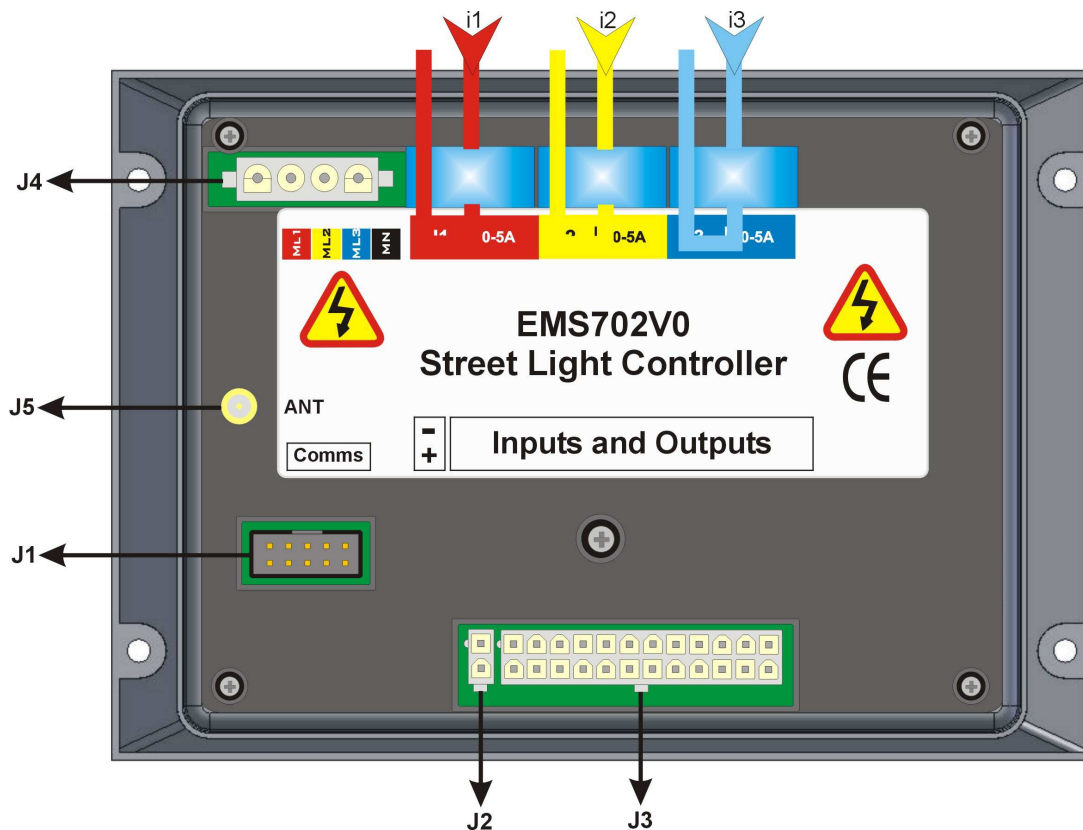
11. Communications

The unit is fitted with a fully functional communication port (J1) which communicates using Modbus ASCII and RTU protocols. This port may be plugged into RS232 or RS485 communication adaptors and through these to a building management system.

12. Unit General Specifications

Feature	Specification
Overall Dimensions	180 x 126 x 51mm
Mounting Hole	155 x 117mm
IP rating	IP56 front, IP20 rear
Supply Voltage	8 V to 36V DC Nominal Automotive
Operating Temperature	-20 to +70°C
Storage Temperature	-20 to +70°C
Relative Humidity	95% non condensing
Supply Current	Standby < 10mA Running 70mA
AC Voltage Range	L-N = 350VRMS.
AC Frequency Range	40 – 70Hz
Overall Accuracy	Class 1
Digital Output Rating	Open Drain Relay Coil Driver. 300mA 362VDC max. Short Circuit protected.
Digital Input Rating	Opto-coupler isolated. Whetting current 10mA at 12 V DC. DC input protection for +/- 30V DC Transient Protected.
Input Reference	0V Common

13. Installation and Wiring



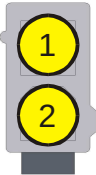
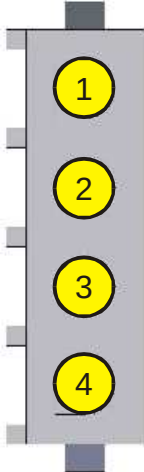
NB: The unit is a complex electronic device and caution should be taken to ensure correct wiring before power is applied.

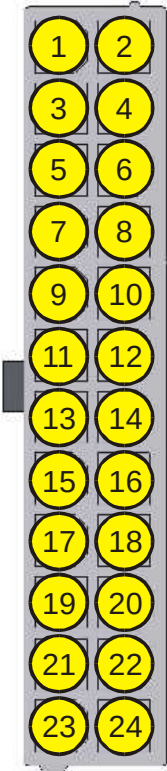
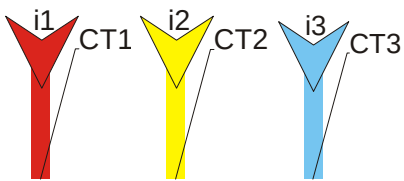
The unit is fitted with 2 and 24 way Molex Minifit or equivalent socket connectors for which mating plugs can be selected from the Amp PE, or TPK range.

The unit is also fitted with 4 way Mate-N-Lok or equivalent socket connectors for which mating plugs supplied by Tyco Electronics or equivalent can be used and Antenna.

The majority of unit wiring is low current for which 0.75mm² wire is sufficient. This excludes the CT wires (*i1*, *i2* and *i3*) for which 1.5mm² wire should be used.

13.1 Connector Detail

Connector Assignment	Connection Information	
J1: Data Port 	Programming and Auxiliary Unit data port. NB: Connect ONLY manufacturer approved equipment to this port	
J2: DC Power Supply 	Pin	Connection
	1	Common –ve. (Note 1)
	2	Battery +ve. (Note 2)
J4: Mains AC Input 	Pin	Connection
	1	Mains AC Phase 1 (Red)
	2	Mains AC Phase 2 (Yellow)
	3	Mains AC Phase 3 (Blue)
	4	Mains AC Neutral
J3 I/O	Pin	Connection
	1	N/A
	2	N/A
	3	N/A
	4	N/A
	5	N/A
	6	N/A
	7	N/A
	8	N/A

Connector Assignment	Connection Information	
	9	N/A
	10	N/A
	11	Door Input
	12	N/A
	13	N/A
	14	N/A
	15	N/A
	16	N/A
	17	Light control
	18	N/A
	19	N/A
	20	N/A
	21	N/A
	22	N/A
	23	N/A
	24	N/A
CT1, CT2 & CT3: Current Transformers 	CT	Use
	1	Phase 1 Current (Red) <i>(Note 3)</i>
	2	Phase 2 Current (Yellow) <i>(Note 3)</i>
	3	Phase 3 Current (Blue) <i>(Note 3)</i>
J5: Antenna 	Pin	Connection (See above for pin numbers)
	1	Antenna

Notes:

1. *This connection must be made directly to the positive terminal of the battery for best performance. Do not make this connection to the positive terminal on the Starting Motor.*
2. *Wire must be passed through the CT in the direction of the arrow.*