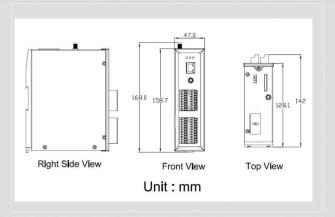


# **M2M Series Products**

## 3G Power Saving PAC with Solar Charger



G-4513 Series



### **Dimensions**

The G-4513 series are M2M (Machine to Machine) Power Saving PAC with a cellular transceiver and a solar charger. It can be used in hydrologic monitoring or mudslide monitoring system. With optional GPS model, the G-4513 can also be a GPS tracking system for vehicle management or maritime system. The features of G-4513 series: Solar charger, 3G module, Ethernet interface, optional GPS module, 3 digital inputs, 3 digital outputs, 8 analog inputs, 1 relay output.

#### Features

- Embedded MiniOS7, anti-virus
- Support GSM 850 / 900 / 1800 / 1900 MHz.
- Support WCDMA 850 / 900 / 1900 / 2100 MHz
- Solar charger for Lead acid battery
- 10/100 Base-TX compatible Ethernet controller
- COM port: COM1 (5-wire RS232), COM2 (RS-485)
- I/O: 3 DI, 3 DO, 8 AI, 1 relay DO
- Application

- Support SD card.
- Built-in RTC, NVRAM, EEPROM
- 128\*64 dots LCM display (option)
- GPS: 32 channels with All-In-View tracking (option)
- Support TCP, UDP client connection over 3G
- High reliability in harsh environments
- DIN-Rail mountable







## Hardware Specifications

	tem	G-4513-3GWA	G-4513D-3GWA	G-4513P-3GWA	G-4513PD-3GWA	
CPU		80 MHz internal micropro	cessor	•	'	
SRAM/Flash		512K/512K , real time clock, watchdog timer				
NVRAM		31 bytes, battery backup, data valid up to 10 years				
EEPROM		16 KB, retention > 40 years. 1,000,000 erase/write cycles				
Comm. Interf	face					
COM ports		COM1:5-wire RS-232; CO	)M2: RS-485			
Ethernet		10/100 Base-TX Ethernet				
GSM Interfac	re	10,100 Base 111 Benefitet				
Frequency I		GSM 850/900/1800/1900	MHz			
GPRS conn		GPRS class 10/8; GPRS station class B				
SMS	cetivity	MT, MO, CB, Text and PI				
3G Interface		WII, MO, CB, Text and II	30 mode			
Frequency I	Rand	WCDMA 850/900/1900/2	100 MHz			
Power Class		Class 3 (250mW @ WCD				
Digital Input		Class 5 (250lif W & WCD)	WA/1131 A)			
Input Chanr		3				
Input Type	1101	Source(Dry Type), Common Ground				
	Laval	+1 V max.				
Off Voltage Level On Voltage Level		+1 V max. +3.5 ~ +30 V				
Isolated Voltage		Non-isolated				
Digital Outpu	ıt	1 2				
Output Channel		3				
Output Type		Open Collector (Sink/NPN)				
Load Voltage		+30 VDC max.				
Load Current		100 mA max.				
Isolated Voltage		Non-isolated				
<b>Analog Input</b>						
Input Chanr	nel	8				
Resolution		12 - bit				
Input Range	e/Type	0 ~ 20 mA				
Sample Rate		1 KHz max. (Read one channel)				
Accuracy		+/- 2 LSB (+/- 0.0097 mA)				
Isolated Voltage		2500 Vrms 3000Dc to DC				
Relay						
Output Cha	nnel / Type	1 / Form C				
Input Range		2A@30 Vdc ; 0.25 A @25	0 Vac			
Mechanical endurance		typ. 10 <sup>8</sup> operations				
GPS Interface		typ. 10 operations				
Support Cha				32		
Sensitivity		-		-	m (with avtarnal I NA)	
		Tracking = up to -159 dBm (with ex				
		Cold start = up to -146 dBm (with external LNA)				
				Hot start (Open Sky) = 2 s(typical)		
Acquisition	Time	-		Cold start (Open Sky) = 36 s(typical)		
Acquisition					6 s(typical)	
Acquisition Protocol Su	pport	-		NMEA 0183 version 3.01	6 s(typical)	
Acquisition	pport ee		00.61		6 s(typical)	
Acquisition Protocol Su	pport ee Effective		80.61 mm x 14.37 mm		6 s(typical) 80.61 mm x 14.37 mm (W	
Acquisition Protocol Su	pport ee Effective display area	-	(W x H)		80.61 mm x 14.37 mm (W x H)	
Acquisition Protocol Su LCD Interfac	pport  Effective display area Module	-	(W x H) 93 mm x 70 mm x 1.6		80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm	
Acquisition Protocol Su LCD Interfac	pport ee Effective display area	-	(W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more		80.61 mm x 14.37 mm (W x H)	
Acquisition Protocol Su LCD Interfac	pport  Effective display area Module	-	(W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours		80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under	
Acquisition Protocol Su LCD Interfac General Life Time	pport  E Effective display area Module Dimension	-	(W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more		80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than	
Acquisition Protocol Su LCD Interfac General Life Time Power (Solar	pport  E Effective display area Module Dimension	-	(W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation		80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under	
Acquisition Protocol Su LCD Interfac General Life Time Power (Solar Protection	Effective display area Module Dimension	Power reverse polarity pro	(W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation		80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under	
Acquisition Protocol Su LCD Interfac General Life Time Power (Solar Protection Frame Grou	Effective display area Module Dimension  Input)  Ind Protection	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot	(W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	NMEA 0183 version 3.01	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under	
Acquisition Protocol Su LCD Interfac General Life Time Power (Solar Protection Frame Group Power Requirements	Effective display area Module Dimension  Input)  Ind Protection airement	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max	(W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation stection  x. Voltage of Solar Panel m	NMEA 0183 version 3.01  -  -  ust less +30V)	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interfac General Life Time Power (Solar Protection Frame Group Power Requiper Power Cons	Effective display area Module Dimension  Input)  Input  Module Dimension	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max	(W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation stection  x. Voltage of Solar Panel m	NMEA 0183 version 3.01	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interfac General Life Time Power (Solar Protection Frame Group Power Requirements	Effective display area Module Dimension  Input)  Input  Module Dimension	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max	(W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation stection  x. Voltage of Solar Panel m	NMEA 0183 version 3.01  -  -  ust less +30V)	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interfac General Life Time Power (Solar Protection Frame Group Power Requiper Power Cons	Effective display area Module Dimension  Input)  Input  Module Dimension	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  otection  c. Voltage of Solar Panel mile: 77 mA @ 24 V <sub>DC</sub> ; Data I	NMEA 0183 version 3.01  -  -  ust less +30V)	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interfac General Life Time Power (Solar Protection Frame Grou Power Requ Power Cons Lead Acid Ba	Effective display area Module Dimension  Input)  Input  In	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery Voltage of Power Input mu	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  attention  contection  c. Voltage of Solar Panel mile: 77 mA @ 24 V <sub>DC</sub> ; Data I	NMEA 0183 version 3.01  ust less +30V) Link: 150 ~ 400 mA (peak)	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interfac General Life Time Power (Solar Protection Frame Grou Power Requ Power Cons Lead Acid Ba Battery	Effective display area Module Dimension  Input)  Input  In	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery Voltage of Power Input mu	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  otection  c. Voltage of Solar Panel mile: 77 mA @ 24 V <sub>DC</sub> ; Data I	NMEA 0183 version 3.01  ust less +30V) Link: 150 ~ 400 mA (peak)	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interfac General  Life Time Power (Solar Protection Frame Grou Power Requ Power Cons Lead Acid Ba Battery Charging Vo	Effective display area Module Dimension  Input)  Input  Input  Ind Protection airement sumption attery  Oltage  e Protect	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery Voltage of Power Input mu	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  attention  contection  c. Voltage of Solar Panel mile: 77 mA @ 24 V <sub>DC</sub> ; Data I	NMEA 0183 version 3.01  ust less +30V) Link: 150 ~ 400 mA (peak)	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interfac General  Life Time Power (Solar Protection Frame Grou Power Requ Power Cons Lead Acid Ba Battery Charging Vo Low Voltage	Effective display area Module Dimension  Input)  Input  Input  Ind Protection airement sumption attery  Oltage  e Protect	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery Voltage of Power Input mu	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  attention  contection  c. Voltage of Solar Panel mile: 77 mA @ 24 V <sub>DC</sub> ; Data I	NMEA 0183 version 3.01  ust less +30V) Link: 150 ~ 400 mA (peak)	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interfac  General  Life Time Power (Solar Protection Frame Grou Power Requ Power Cons Lead Acid Ba Battery Charging Vo Low Voltage LED Indicato	Effective display area Module Dimension  Input)  Input  Input  Ind Protection airement sumption attery  Oltage  e Protect	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery Voltage of Power Input mu Low Voltage disconnect =	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  attention  contection  c. Voltage of Solar Panel mile: 77 mA @ 24 V <sub>DC</sub> ; Data I	NMEA 0183 version 3.01  ust less +30V) Link: 150 ~ 400 mA (peak)	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interface General  Life Time Power (Solar Protection Frame Group Power Cons Lead Acid Ba Battery Charging Vo Low Voltage LED Indicato System	Effective display area Module Dimension  Input)  Input  Input  Ind Protection airement sumption attery  Oltage  e Protect	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery Voltage of Power Input mu Low Voltage disconnect =  Red	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  attention  contection  c. Voltage of Solar Panel mile: 77 mA @ 24 V <sub>DC</sub> ; Data I	NMEA 0183 version 3.01  ust less +30V) Link: 150 ~ 400 mA (peak)	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interface General  Life Time Power (Solar Protection Frame Grou Power Requ Power Cons Lead Acid Ba Battery Charging Vc Low Voltage LED Indicato System 3G GPS	Executive display area Module Dimension  Input)  Input  Input  Input  Index Protection  Intervent sumption  Intervent sumption  Intervent sumption  Intervent sumption  Intervent sumption  Input  Inp	Power reverse polarity pro  ESD, Surge, EFT, Hi-Pot  +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max  Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery  Voltage of Power Input mt  Low Voltage disconnect =  Red  Yellow  -	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  attention  contection  c. Voltage of Solar Panel mile: 77 mA @ 24 V <sub>DC</sub> ; Data I	NMEA 0183 version 3.01	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interface General  Life Time Power (Solar Protection Frame Grou Power Cons Lead Acid Ba Battery Charging Ve Low Voltage LED Indicato System 3G GPS Charging / I	Executive display area Module Dimension  Input)  Input  Input  Input  Index Protection  Intervent sumption  Intervent sumption  Intervent sumption  Intervent sumption  Intervent sumption  Input  Inp	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery Voltage of Power Input mu Low Voltage disconnect =  Red	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  attention  contection  c. Voltage of Solar Panel mile: 77 mA @ 24 V <sub>DC</sub> ; Data I	NMEA 0183 version 3.01	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interface General  Life Time Power (Solar Protection Frame Grout Power Constant Battery Charging Voltage LED Indicato System 3G GPS Charging / I Mechanical	Executive display area Module Dimension  Input)  Input  Input  Input  Index Protection  Intervent sumption  Intervent sumption  Intervent sumption  Intervent sumption  Intervent sumption  Input  Inp	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery Voltage of Power Input mt Low Voltage disconnect =  Red Yellow - Green / Red	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  attention  contection  c. Voltage of Solar Panel mile: 77 mA @ 24 V <sub>DC</sub> ; Data I	NMEA 0183 version 3.01	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interface General  Life Time Power (Solar Protection Frame Grout Power Requested Power Constant Lead Acid Battery Charging Voltage LED Indicator System 3G GPS Charging / I Mechanical Casing	Executive display area Module Dimension  Input)  Input  Input  Ind Protection irrement sumption attery  oltage e Protect  Fault	- Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA @ 12V; Idl  12V Lead-Acid Battery Voltage of Power Input m Low Voltage disconnect =  Red Yellow - Green / Red  Metal	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  otection  x. Voltage of Solar Panel mre: 77 mA @ 24 V <sub>DC</sub> ; Data I list be over +16V  11.1V / Low Voltage recon	NMEA 0183 version 3.01	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interface General  Life Time Power (Solar Protection Frame Grout Power Requipment Constant Lead Acid Ba Battery Charging Volume Law Voltage LED Indicato System 3G GPS Charging / I Mechanical Casing Dimensions	Input)  Input)  Input)  Input  Input  Ind Protection  Interv	- Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery Voltage of Power Input mt Low Voltage disconnect =  Red Yellow - Green / Red  Metal 47 mm x 142 mm x 168 m	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  otection  A. Voltage of Solar Panel me: 77 mA @ 24 V <sub>DC</sub> ; Data I list be over +16V  11.1V / Low Voltage recon	NMEA 0183 version 3.01	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interface General  Life Time Power (Solar Protection Frame Grout Power Requipment Constant Support Constant Suppor	Effective display area Module Dimension  Input)  Ind Protection arement sumption ditery  oltage e Protect  Fault	- Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA @ 12V; Idl  12V Lead-Acid Battery Voltage of Power Input m Low Voltage disconnect =  Red Yellow - Green / Red  Metal	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  otection  A. Voltage of Solar Panel me: 77 mA @ 24 V <sub>DC</sub> ; Data I list be over +16V  11.1V / Low Voltage recon	NMEA 0183 version 3.01	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	
Acquisition Protocol Su LCD Interface General  Life Time Power (Solar Protection Frame Group Power Cons Lead Acid Ba Battery Charging Vo Low Voltage LED Indicato System 3G GPS Charging / I Mechanical Casing Dimensions Installation Environment	Effective display area Module Dimension  Input)  Ind Protection arement sumption attery  Oltage Protect  Fault	Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery Voltage of Power Input mt Low Voltage disconnect =  Red Yellow - Green / Red  Metal 47 mm x 142 mm x 168 m DIN-Rail and Wall mount	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  otection  X. Voltage of Solar Panel mm e: 77 mA @ 24 V <sub>DC</sub> ; Data I  sist be over +16V  11.1V / Low Voltage recommendation of the commendation of the commend	NMEA 0183 version 3.01  ust less +30V) Link: 150 ~ 400 mA (peak)  mect = 12.6V  Green	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation  @ 24 V <sub>DC</sub>	
Acquisition Protocol Su LCD Interface General  Life Time Power (Solar Protection Frame Grout Power Requipment Constant Support Constant Support Constant Support Constant Support Constant Support Constant Support Consumption Support Consumption Support Consumption Support Constant Support Consta	Effective display area Module Dimension  Input)  Ind Protection arement sumption attery  Oltage Protect  Fault  Cemperature	- Power reverse polarity pro ESD, Surge, EFT, Hi-Pot +10 V <sub>DC</sub> ~ +30 V <sub>DC</sub> , (Max Sleep: < 10 mA@12V; Idl  12V Lead-Acid Battery Voltage of Power Input mt Low Voltage disconnect =  Red Yellow - Green / Red  Metal 47 mm x 142 mm x 168 m	(W x H)  93 mm x 70 mm x 1.6 mm (W x H x T)  Expected life is more than 100,000 hours under normal operation  otection  A. Voltage of Solar Panel me: 77 mA @ 24 V <sub>DC</sub> ; Data I list be over +16V  11.1V / Low Voltage recon	NMEA 0183 version 3.01	80.61 mm x 14.37 mm (W x H) 93 mm x 70 mm x 1.6 mm (W x H x T) Expected life is more than 100,000 hours under normal operation	