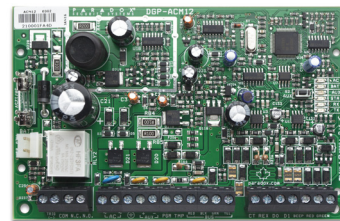


# ACM12 Installation Manual V4.72 and higher

Supports EVOHD / EVO192 V4.5 and higher



## Description

Thank you for choosing the ACM12 for your access control. The ACM12 is designed to be used with the Paradox EVO system. It allows you to manage access of one door, via card, pin or both, provide forced door and door left open detection, and arm / disarm functions. The ACM12 supports full Off-Line functionality, which stores the entire database in memory when the panel connection is lost and enables full synchronization upon restore. It supports one IN reader and one OUT reader if using 4-wire Paradox readers, or one IN reader only if using the 7-wire 26-bit Wiegand reader. The ACM12 also supports a REX, a door contact that can be an alarm zone, and a door locking device.

With accelerated response of up to 999 users, simple and minimal programming, as well as easy installation, the ACM12 is designed to provide you with a reliable and professional access solution.

## Compatibility

ACM12 V4.5 and higher is compatible only with panels EVOHD V4.5 and higher and EVO192 V4.5 and higher.

## Upgrade Note

When upgrading to the latest version, it is advisable to upgrade the panel first, and then upgrade the ACM12 module.

## Off-Line Feature

The ACM12 V4.5 and higher fully supports Off-Line functionality. In the case of panel connection loss, the ACM12 will switch to Off-Line mode and will fully function with user access level and schedules; arm / disarm user permissions will be overridden. While resuming communications with the panel, all programming changes will be updated. In Off-Line mode, events are kept locally in the module and can be uploaded manually for each ACM12 when communication is restored.

## Installation (Figure 1)

Connect the ACM12 as per the drawing below. When powering up, all ACM12 modules will synchronize with the panel and upload all user and schedule data. Typically, 100 users and 10 schedules will take about 50 seconds to upload. This will also take place upon resuming connection with the panel. Synchronization is indicated by RX/TX LEDs flashing together at 4 Hz. If an ACM12 V4.5 detects a connection to a different EVO panel, data will be erased and the new panel data will be synchronized.

**POWER:** The ACM12 should be powered with a 16 Vac 20Va. Battery should be connected.

**Unlock Device Diode:** When connecting a locking device, it is recommended to connect diode 1N4007 as per Figure 1, to keep the relay contacts reliability.

**Firmware Upgrade:** Should you need to upgrade the ACM12 firmware, connect the CV4USB A+ to Green and B- to Yellow, and power Red and Black.

Connection	Description	Connection	Description
TRIG	Shorting to ground will activate the unlock relay.	TMP	Tamper switch follow panel definition Section [3034] ACM12 programming section [003] option1 to enable.
COM/NC/NO	Unlocking relay, max 5A / 28 VDC AC - 16V 20 VAC	EVO BUS	Connect to EVO bus.
⊖	Additional Aux (-)	CT	Zone for door contact. Can be system zone Section [0400], EOL will follow panel global EOL panel section 3033 bit 7.
AUX	Use to power the Reader, REX, and other devices. Max output 600mA, fuseless shutdown.	REX	Request for exit detector connection, it is connected without EOL.
PGM	50mA output follow. Some predefined conditions, see programming Section [011].	D0	Connect to Green wire of the Reader.
CT	Door contact is used to monitor door condition and to identify door left open and forced door status.	D1	Connect to Yellow wire of Reader.

## Turning Auxiliary Power ON / OFF (V4.52 and above)

Press and hold the AUX ON / OFF switch for 7 seconds. This toggles the auxiliary power ON or OFF.

## IN / OUT Reader Assignment (V4.52 and above)

The reader that is detected first will be considered the IN reader, by default. The reader that is detected second will be considered the OUT reader.

## Changing the Default Reader Assignment (V4.52 and above)

- Press and hold the AUX ON / OFF switch for 3 seconds. The ERROR, TX and RX LEDs flash for 2-3 seconds.
- Press any key or present an access card to the reader you want to designate as the IN reader. Automatically, the other reader will be designated as the OUT reader.

## ACM12 Connection to PS45

Connect the ACM12's AC and ground to the PS45's Aux + and - connectors. You can power up to three ACM12 modules using the PS45 Power Supply instead of using separate transformers for each ACM12. Connect each ACM to the appropriate output, as shown below.

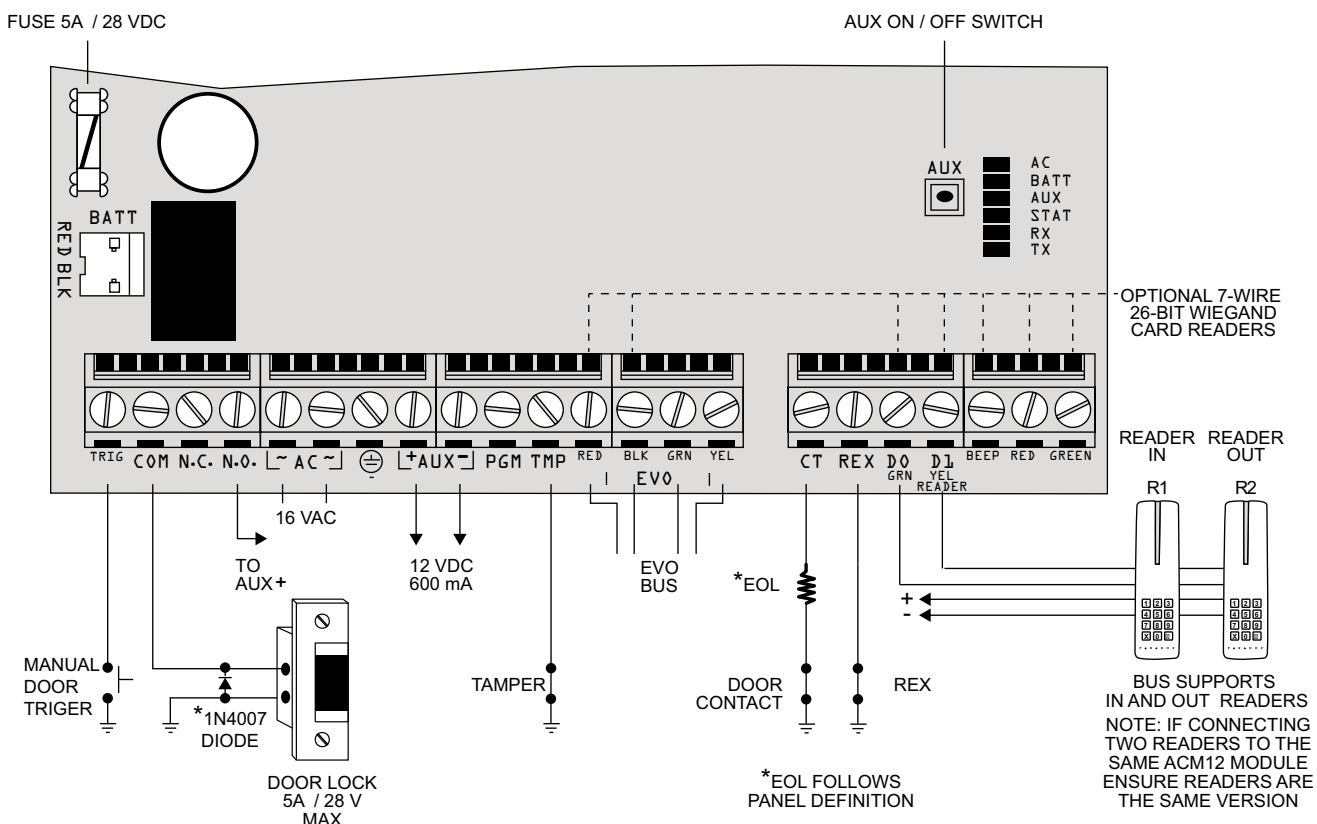
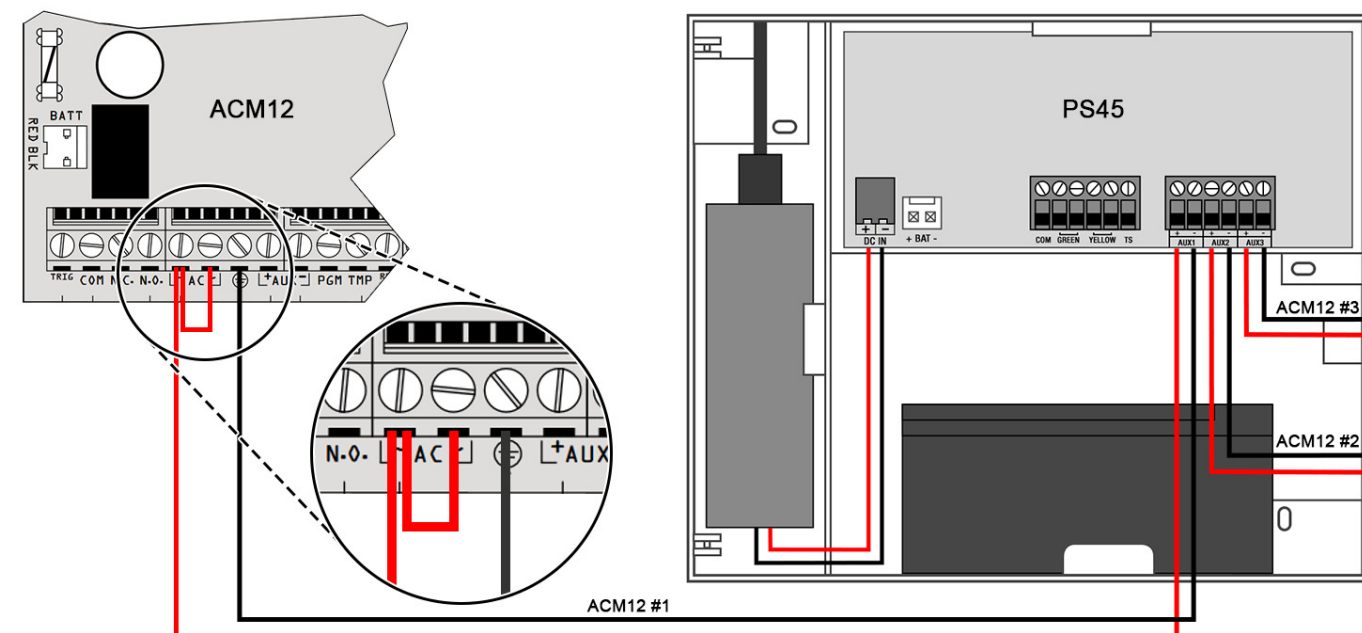


Figure 1



## Programming via BabyWare or Keypad

Installer + Section [4003] + Serial Number of the ACM12.

\* = Default

Section [001] General Options			
Option		OFF	ON
[1]	Tamper Input	<b>Disabled*</b>	Enabled
[2]	Battery Charging Current	<b>350mA*</b>	850mA
[3]	AC monitoring	Disabled	<b>Enabled*</b>
		[4]	[5]
[4] & [5]	Card only	<b>OFF*</b>	<b>OFF*</b>
	Card or PIN	ON	OFF
	Arm and Access: Card or PIN Disarm: Card <b>and</b> PIN	OFF	ON
	Card and PIN always	ON	ON
[6]	Unlock door on Fire Alarm	Disabled	<b>Enabled*</b>
[7]	Door forced open Alarm	<b>Disabled*</b>	Enabled
[8]	Card activates door unlocked schedule (V4.52 and above)	Disabled	<b>Enabled*</b>

Section	Data	Description	Default
[002]	__/__/__ (Seconds)	Door Unlocked Period	005
[003]	__/__/__ (Seconds)	Door Unlocked Period Extension (handicap use)	015
[004]	__/__/__ (Seconds)	Door Left Open warning delay	000
[005]	__/__/__ (Minutes)	Door Left Open Alarm delay from warning	001
[006]	__/__/__ (Minutes)	Safe Unlock delay	00
*[007]	__/__/__ (01 - 32)	1 <sup>st</sup> Unlock Door Schedule	00
*[008]	__/__/__ (01 - 32)	2 <sup>nd</sup> Unlock Door Schedule	00
*[009]	__/__/__ (01 - 32)	3 <sup>rd</sup> Unlock Door Schedule	00
*[010]	__/__/__ (01 - 32)	4 <sup>th</sup> Unlock Door Schedule	00

\* Follow Panel User Schedules.

Section	Data	Description	Default
[011]	__/__	PGM Activation	00
00 : Arm 01 : Follow Door Unlock Schedule 02 : Follow Access Granted (will be activated for the unlock period) 03 : Follow Door Forced State 04 : Follow Door Left Open Warning / Alarm 05 : Utility Key 1 06 : Utility Key 2 07 : Utility Key 3 08 : Utility Key 4 09 : Utility Key 5 10 : Utility Key 6 11 : Utility Key 7 12 : Utility Key 8 13 – 99 : Future Use			

Section [012]			
Option		OFF	ON
[1]	Partition 1	Disabled	<b>Enabled*</b>
[2]	Partition 2	<b>Disabled*</b>	Enabled
[3]	Partition 3	<b>Disabled*</b>	Enabled
[4]	Partition 4	<b>Disabled*</b>	Enabled
[5]	Partition 5	<b>Disabled*</b>	Enabled
[6]	Partition 6	<b>Disabled*</b>	Enabled
[7]	Partition 7	<b>Disabled*</b>	Enabled
[8]	Partition 8	<b>Disabled*</b>	Enabled

Section [013]			
Option		OFF	ON
[1]	Re-lock option	<b>On door opening</b>	On door closure
[2]	On access granted / utility key event	<b>PGM follow lock delay</b>	PGM toggle state
[3]	Unlock schedule override on access granted	<b>Disabled</b>	Card locks door
[4]	Door left open beep on reader	<b>Disabled</b>	Enable
[5] - [8]	For future use	-	-

## LED Feedback

AC	On (green) when module has AC power.
BATT	On (green) when charging and during battery tests. Battery test every one minute.
AUX	On (Yellow) when auxiliary output is active.
STAT	On or flash (Red) when an error occurs. Refer to Error Display table below.
RX	Flashes (Green) when receiving information from the panel.
TX	Flashes (Green) when transmitting information to the panel.

\* RX / TX will flash together at a frequency of 4Hz when synchronization takes place.

## Error Display

STAT (Red)	RX (Green)	TX (Green)	Condition
ON	OFF	OFF	EVO bus is shorted / No clock / No data (offline)
ON	OFF	ON	Wrong data / Invalid EVO address, too many modules or incompatible panel version
ON	ON	ON	EVO bus YEL and GRN reversed
FLASH	----	----	EVO bus voltage is low (less than 9V)

## Technical Specifications

User Capacity	999
Door Unlock Schedules	4 (total of 8 periods)
User Schedules Capacity	32
User Security Levels	15
Power	16 Vac, 20 VA
Auxiliary Output	12 Vdc, 600 mA, 1A fuseless shutdown
Battery	12 Vdc, Gel Cell. Connection protected with 5A fuse
Door Unlock	Form C relay rated at 5A / 28 Vdc
PGM Output	50 mA predefined definitions
Device Connections	Two Paradox 4-wire readers or one 7-wire 26-bit Wiegand reader, door contact, REX device, tamper
Manual Unlock	Negative trigger input
Control Panel Compatibility	EVOHD Control Panel V4.5 and above EVO192 Control Panel V4.5 and above
Metal Box (optional)	Minimum 20 x 25.5 x 7.6 cm (8 x 10 x 3 in.) metal box
Dimensions	14 x 9.2 x 2.5 cm (5.5 x 3.6 x 1 in.)

## Warranty

Please refer to the Limited Warranty Statement found on the website [www.paradox.com](http://www.paradox.com) or contact your local distributor.

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## Patents

One or more of the following US patents may apply: 7046142, 6215399, 6111256, 6104319, 5920259, 5886632, 5721542, 5287111, and RE39406 and other pending patents may apply. Canadian and international patents may also apply.



**4-Wire Indoor/Outdoor Proximity Reader  
R910 V4.50**



Printed in Canada 09/2018

PARADOX.COM

**English**

**Technical Specifications**

Power Input:	11Vdc to 14.5Vdc
Current Consumption	100mA, with card 115 mA
Frequency:	Exciter field 125 KHz pulse modulated
Operating Temperature:	-35°C (-31°F) to +65°C (149°F)
Output Formats:	RS-485
Cable Distance:	300m (1000 ft.)
Cables:	4-wire Cables (twisted pair recommended)
Compatibilities:	Access Control Module (ACM) Series

*All specifications are subject to change without notice.*

**Tricolour LED Display**

The R910 reader includes a tricolour LED display (red, green and amber) that is used to indicate the reader's status. The LED's intensity is adjusted through the Access Control Module (ACM).

**Audible Tone**

The R910 reader includes a built in beeper with a frequency that is adjusted through the ACM.

**Weather Resistant**

Mount indoors or outdoors.

**Error Display**

All R910 readers display communication errors between the reader and the ACM by flashing the amber LED every second.

**Firmware Upgrade**

Connect the CV4USB as shown in Figure 2. Refer to the CV4USB installation manual for additional information.

**Mounting on Metal**

Metal may decrease the read range. The R910 card reader can be mounted on metal but do not surround it by metal. If the reader must be installed in a metal enclosure, ensure that the face of the card reader is not covered and that there's at least 4cm (1.6") between the card reader and the metal on all sides.

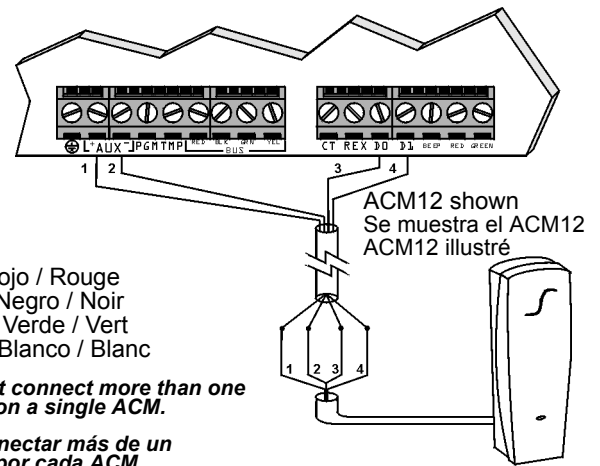
**Warranty**

For complete warranty information on this product please refer to the Limited Warranty Statement found on the website [www.paradox.com/terms](http://www.paradox.com/terms). Your use of the Paradox product signifies your acceptance of all warranty terms and conditions

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**Figure 1: 4-wire Connection / Conexión de 4 Cables / Raccordement à 4 fils**



1. Red / Rojo / Rouge
2. Black / Negro / Noir
3. Green / Verde / Vert
4. White / Blanco / Blanc

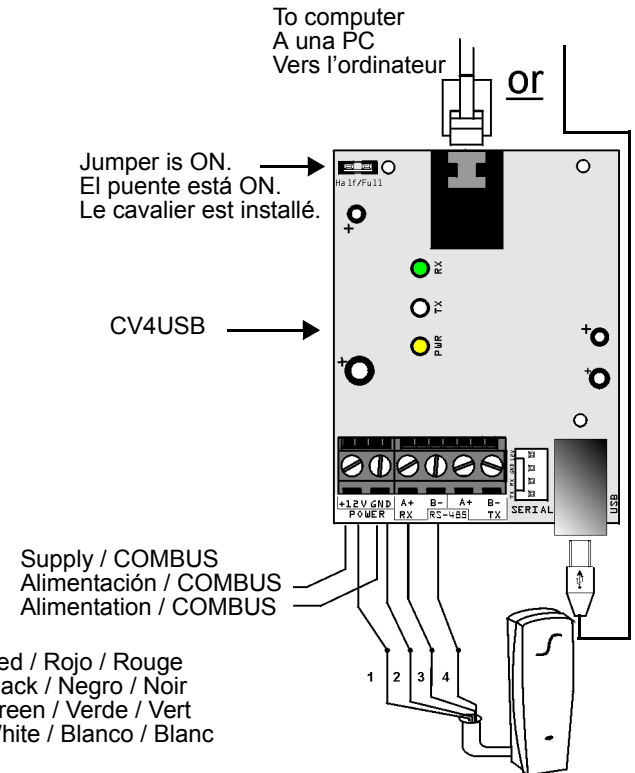


**Do not connect more than one R910 on a single ACM.**

**No conectar más de un R910 por cada ACM.**

**Ne pas raccorder plus d'un R910 sur un seul ACM.**

**Figure 2: Firmware Upgrade / Actualización del Firmware / Mise à niveau du micrologiciel**



RESIDENTIAL EQUIPMENT  
CLASS B DIGITAL DEVICE  
INFORMATION TO USER

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## Especificaciones Técnicas

Alimentación:	11Vcc a 14.5Vcc
Consumo de Corriente	100mA, 115 mA con Tarjeta
Frecuencia:	Campo de excitador de 125 KHz modulado por pulsos
Temperatura de Funcionamiento:	-35°C (-31°F) a +65°C (149°F)
Formatos de Salida:	RS-485
Distancia de Cables:	300m (1000ft)
Cables:	Cable de 4 alambres (se recomienda cable de par trenzado)
Compatibilidades:	Serie de Módulo de Control de Acceso (ACM)

Todas las especificaciones pueden cambiar sin previo aviso.

### Indicador LED Tricolor

El lector R910 incluye un indicador LED tricolor (rojo, verde y ámbar) usado para indicar el estado del lector. La intensidad de las luces LED se ajusta vía el Módulo de Control de Acceso (ACM).

### Tono Audible

El lector R910 incluye un generador de tonos en placa con una frecuencia ajustable mediante el ACM.

### A prueba de Intemperies

Para montaje en interiores o exteriores.

### Indicador de Error

Todos los lectores R910 indican los errores de comunicación que pudieran ocurrir entre el lector y el ACM mediante el parpadeo de la luz LED ámbar una vez cada segundo.

### Actualización del Firmware

Conectar el CV4USB se muestra la Figura 2. Consultar el manual de instalación del CV4USB para más información.

### Montaje Sobre Metal

El metal podría reducir el alcance de lectura. El lector de tarjetas R910 puede ser montado sobre metal pero no debe estar rodeado de metal. Si el lector debe ser instalado en una caja metálica, asegúrese que nada cubra su parte frontal y de mantener una distancia de por lo menos 4cm (1.6") entre el lector de tarjetas y el metal, por todos lados.

EQUIPO RESIDENCIAL  
DISPOSITIVO DIGITAL DE CLASE B  
INFORMACIÓN PARA EL USUARIO

Este dispositivo cumple con la Parte 15 de los Reglamentos FCC. Su operación está sujeta a las dos condiciones siguientes: (1) Este dispositivo no debe causar severa interferencia, y (2) Este dispositivo debe aceptar cualquier interferencia recibida, incluyendo interferencia que podría causar un funcionamiento no deseado.

Este equipo ha sido probado y cumple con los límites para Dispositivos Digitales de Clase B, según las especificaciones de la Parte 15 de los reglamentos de la FCC. Estos límites han sido diseñados para proveer una razonable protección contra los riesgos de interferencia en instalaciones residenciales. Este equipo genera, usa y puede irradiar radiofrecuencias, y, si no es instalado y usado según las instrucciones, puede causar severa interferencia en las comunicaciones vía radio. Sin embargo, no hay garantía de que no ocurrirá interferencia en una instalación en particular. Si este equipo causa interferencias en la recepción de señales de radio o de televisión, lo cual puede ser determinado mediante el encendido y apagado del equipo, esporádicamente, se sugiere que el usuario trate de corregir la interferencia por medio de una o más de las siguientes medidas:

- Reorientar o relocalizar la antena receptora
- Aumentar la separación entre el equipo y el receptor
- Conectar el equipo en un enchufe en un circuito diferente al cual está conectado el receptor
- Para asistencia, consultar con el instalador o con un técnico de radio /TV experimentado

Todo cambio o modificación que no haya sido claramente aprobado por la parte responsable de la conformidad puede anular la autorización del usuario para operar este equipo.

### Garantía

Para una información detallada acerca de la garantía de este producto consultar la Declaración de Garantía Limitada (en inglés) que se encuentra en el sitio web de paradox: [www.paradox.ca/terms](http://www.paradox.ca/terms). El uso de este producto Paradox significa la aceptación de todos los términos y condiciones de la garantía

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## Spécifications techniques

Tension d'entrée :	11 Vc.c. à 14,5 Vc.c.
Consommation de courant :	100 mA, 115 mA avec carte
Fréquence :	Champ de l'excitatrice - modulé par impulsions à 125 kHz
Température de fonctionnement :	-35 °C (-31 °F) à +65 °C (149 °F)
Formats de sortie :	RS-485
Longueur du câble :	300 m (1000 pi)
Câbles :	Câbles à 4 fils (recommandé : paires torsadées)
Compatibilité:	Série Module de contrôle d'accès (ACM)

Spécifications sujettes à changement sans préavis.

### Affichage tricolore à DEL

Le lecteur R910 comprend un affichage tricolore à DEL (rouge, verte et ambre) utilisé pour indiquer l'état du lecteur. L'intensité des DEL s'ajuste à l'aide du Module de contrôle d'accès (ACM).

### Tonalité audible

Le lecteur R910 comprend un avertisseur intégré dont la fréquence s'ajuste à l'aide du Module de contrôle d'accès (ACM).

### Résistant aux intempéries

Installation à l'intérieur ou à l'extérieur.

### Affichage d'erreurs

Tous les lecteurs R910 affichent les erreurs de communication entre le lecteur et le Module (ACM) par le clignotement de la DEL ambre chaque seconde.

### Mise à niveau du micrologiciel

Raccorder le CV4USB, tel qu'illustré à la Figure 2. Se référer au manuel d'installation du CV4USB pour plus amples renseignements.

### Montage sur une surface métallique

Le métal peut causer une diminution de la portée de lecture. Il est possible de monter le lecteur de cartes R910 sur une surface métallique, mais ne pas l'entourer de métal. Si le lecteur doit être installé dans un boîtier métallique, s'assurer que le devant du lecteur de cartes n'est pas couvert et qu'un espace d'au moins 4 cm (1,6 po) est laissé entre le lecteur de cartes et le métal de chaque côté.

ÉQUIPEMENT RÉSIDENTIEL  
DISPOSITIF NUMÉRIQUE DE CLASSE B  
RENSEIGNEMENT POUR L'UTILISATEUR

Ce dispositif est conforme à la Partie 15 des règles de la FCC. Son fonctionnement est subordonné aux deux conditions suivantes : (1) Ce dispositif ne devrait pas entraîner de brouillage préjudiciable, (2) Ce dispositif doit accepter toute interférence reçue, y compris les types d'interférence pouvant entraîner un fonctionnement indésirable.

Cet équipement a été testé et est conforme aux limitations des dispositifs numériques de la Classe B selon la Partie 15 des règles de la FCC. Ces limitations ont été établies pour offrir une protection raisonnable contre le brouillage préjudiciable dans une installation résidentielle. Cet appareil émet, utilise et peut rayonner l'énergie des fréquences radio et, s'il n'est pas installé et utilisé conformément aux instructions, peut provoquer du brouillage préjudiciable aux communications radio. Cependant, il n'y a aucune garantie qu'il ne se produira jamais de brouillage dans une installation en particulier. Si cet équipement entraîne du brouillage préjudiciable à la réception radio ou télévisuelle, ce qui peut être déterminé en allumant et en éteignant l'appareil, l'utilisateur est encouragé à tenter d'éliminer l'interférence de l'une des façons suivantes :

- réorienter ou déplacer l'antenne de réception
- augmenter la distance entre l'équipement et le récepteur
- raccorder l'équipement dans une prise de courant d'un circuit différent de celui auquel le récepteur est raccordé
- consulter l'installateur ou un technicien radio/télévision chevronné pour de l'aide

Tout changement ou toute modification n'étant pas formellement approuvé(e) par la partie responsable de la conformité pourrait annuler les droits d'usage de cet appareil.

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## Specifications PRX278000033-P2C

The PRX278000033-P2C is a metal box enclosure for provision multiple module and panel mounting.

Features:

- Many punch-out holes for simple wiring
- Easy door removal
- Sizes: 28cm X 28cm X 7.6cm (11" x11" x 3")

P ▲ R ▲ D O X™



### **Specifications PRXK-TK278**

The PRXK-TK278 is a BOM Kit for 1x tamper switch PRX2502302000-P2C and 1x tamper bracket PRX2781030000-P2C to suit with Paradox Metal Box Enclosure PRX2780000033-P2C; to protect against tampering (opening door or removal from wall).

**P ▲ R ▲ D O X™**



# VRLA 12V7AH

# SA12V7

## Specifications

Nominal Voltage	12 V	
Nominal Capacity 20HR	7.0 AH	
Dimensions	Length	151±1mm (5.94 inches)
	Width	65±1mm (2.56 inches)
	Container Height	95±1mm (3.74 inches)
	Total Height (with terminal)	100±1mm (3.94 inches)
Approx Weight	Approx 2.10 kg (4.63 lbs)	
Terminal	F1	
Container Material	ABS Plastic	
Lead Material	Purity Lead 99.995%	
Sulfuric Acid	Distilled Sulfuric Acid (Zero metal content)	
Separator	AGM	
Rated Capacity	7.00 AH/0.350A	(20hr, 1.80V/cell, 25°C/77°F)
	6.53 AH/0.653A	(10hr, 1.80V/cell, 25°C/77°F)
	6.00 AH/1.20A	(5hr, 1.75V/cell, 25°C/77°F)
	5.37 AH/1.79A	(3hr, 1.75V/cell, 25°C/77°F)
	4.55 AH/4.55A	(1hr, 1.60V/cell, 25°C/77°F)
Max. Discharge Current	105A (5s)	
Internal Resistance	Approx 23mΩ	
Operating Temp.Range	Discharge	: -15 - 50°C (5 - 122°F)
	Charge	: 0 - 40°C (32 - 104°F)
	Storage	: -15 - 40°C (5 - 104°F)
Nominal Operating Temp.Range	25±3°C (77±5°F)	
Cycle Use	Initial Charging Current less than 2.1A. Voltage 14.4V - 14.7V at 25°C (77°F) Temp.Coefficient -30mV/°C	
Standby Use	No limit on Initial Charging Current Voltage 13.5V - 13.8V at 25°C (77°F) Temp.Coefficient -20 mV/°C	
Capacity affected by Temperature	40°C (104°F) 103% 25°C (77°F) 100% 0°C (32°F) 86%	
Self Discharge	Sentry AGM series batteries may be stored for up to 6 months at 25°C (77°F) and then a freshening charge is required. For higher temperatures the time interval will be shorter.	



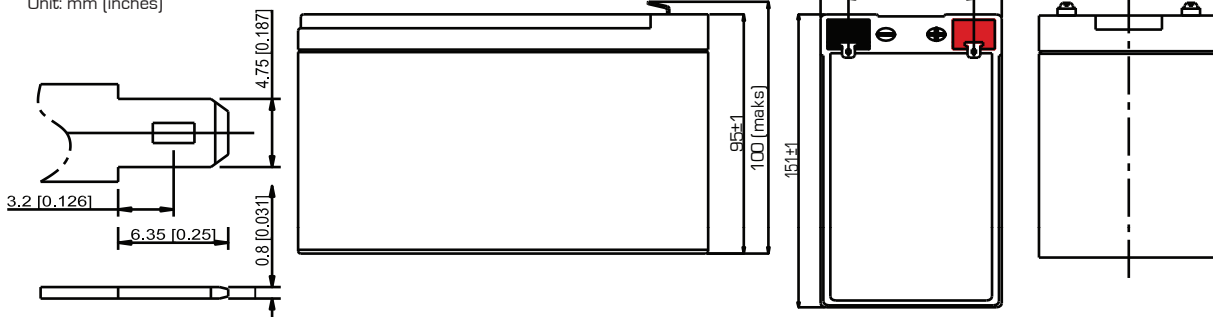
## Applications

- All purpose
- Standby Applications
- Recreation Vehicles
- Uninterruptible Power Supply (UPS)
- Electric Power System (EPS)
- Fire & Security
- Generators
- Medical Equipment

## Dimensions

### F1 Terminal

Unit: mm (inches)



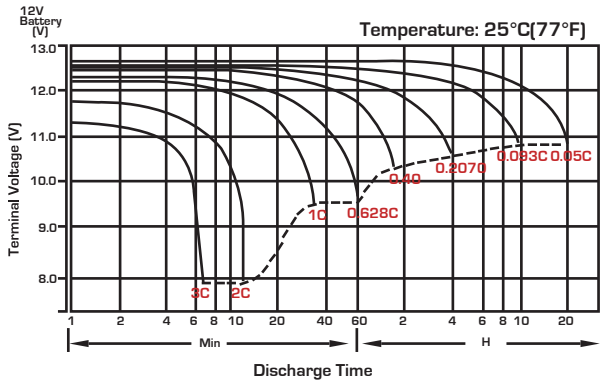
### Constant Current Discharge (Amperes) at 25°C (77°F)

F.V./Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	18.0	12.8	10.48	8.79	6.53	4.79	3.86	2.29	1.69	1.36	1.14	0.98	0.774	0.640	0.345
1.80V/cell	21.4	14.3	11.4	9.44	6.94	5.05	4.03	2.38	1.74	1.40	1.17	1.01	0.791	0.653	0.350
1.75V/cell	24.2	15.6	12.2	10.0	7.29	5.27	4.18	2.45	1.79	1.43	1.20	1.03	0.805	0.663	0.357
1.70V/cell	26.7	16.7	12.9	10.5	7.59	5.46	4.32	2.51	1.83	1.46	1.22	1.05	0.817	0.672	0.361
1.65V/cell	28.8	17.7	13.5	10.9	7.86	5.62	4.46	2.57	1.86	1.48	1.23	1.06	0.826	0.680	0.365
1.60V/cell	30.6	18.6	14.1	11.3	8.09	5.76	4.55	2.61	1.89	1.50	1.25	1.07	0.834	0.685	0.367

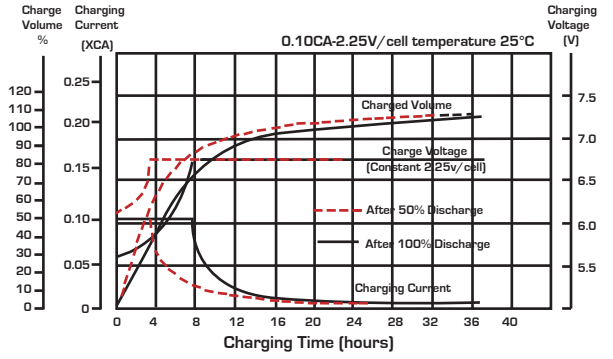
### Constant Power Discharge (Watts/Cell) at 25°C (77°F)

F.V./Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	34.2	24.5	20.2	17.1	12.8	9.44	7.64	4.56	3.37	2.72	2.29	1.99	1.565	1.296	0.701
1.80V/cell	40.2	27.2	21.9	18.3	13.5	9.91	7.96	4.72	3.47	2.79	2.34	2.03	1.593	1.318	0.708
1.75V/cell	45.1	29.5	23.3	19.3	14.2	10.3	8.23	4.85	3.55	2.85	2.39	2.06	1.616	1.344	0.719
1.70V/cell	49.2	31.3	24.5	20.1	14.7	10.6	8.48	4.96	3.62	2.89	2.42	2.09	1.633	1.347	0.725
1.65V/cell	52.6	32.9	25.5	20.8	15.2	10.9	8.73	5.05	3.68	2.93	2.45	2.11	1.649	1.359	0.731
1.60V/cell	55.5	34.3	26.3	21.5	15.5	11.2	8.88	5.12	3.72	2.96	2.47	2.13	1.660	1.367	0.734

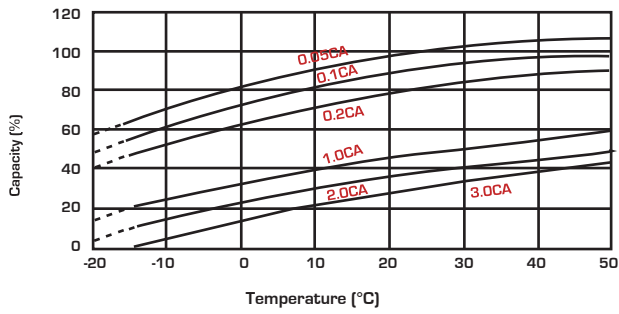
## Discharge Characteristics



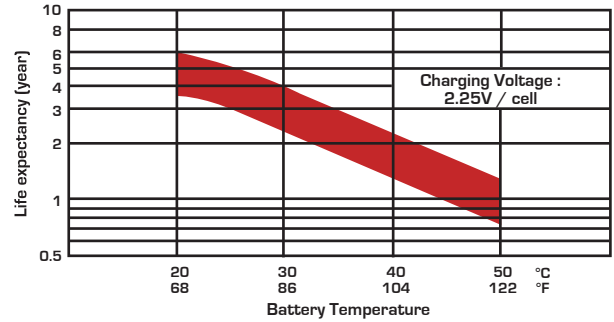
## Float Charging Characteristics



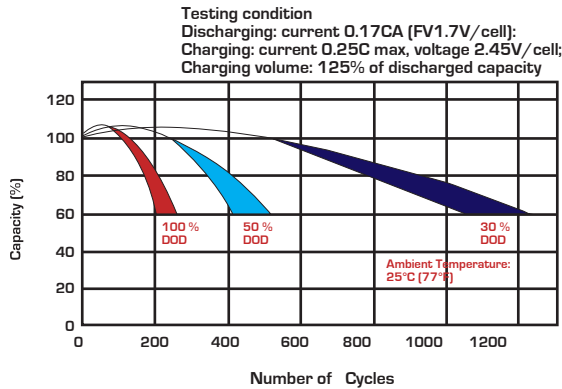
## Temperature Effects in Relation to Battery Capacity



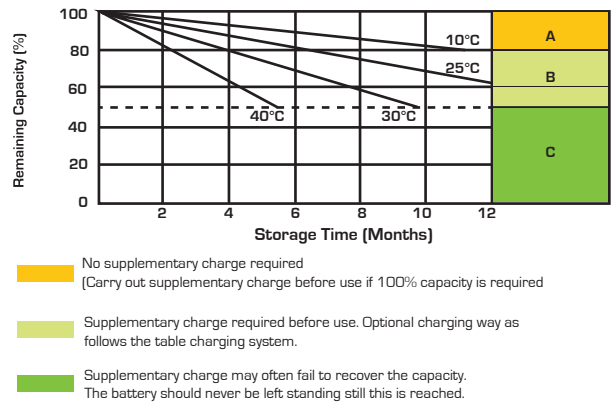
## Effect of Temperature on Long Term Float Life



## Cycle Life in Relation to Depth of Discharge



## Self Discharge Characteristics



## Charging System

DOD	Current Limit (A)	Constant Voltage (V)	Fully Charged Time (h)
20	0.15C <sub>10</sub>	13.5-13.8 vpc (12V)	10
	0.20C <sub>10</sub>	6.75-6.9 vpc (6V)	8
50	0.15C <sub>10</sub>	13.5-13.8 vpc (12V)	15
	0.20C <sub>10</sub>	6.75-6.9 vpc (6V)	12
80	0.15C <sub>10</sub>	13.5-13.8 vpc (12V)	16
	0.20C <sub>10</sub>	6.75-6.9 vpc (6V)	14
100	0.15C <sub>10</sub>	13.5-13.8 vpc (12V)	20
	0.20C <sub>10</sub>	6.75-6.9 vpc (6V)	18

## State of Charge (SOC)

Open Circuit Voltage (V/cell)	Open Circuit Voltage (12V/cell)	Open Circuit Voltage (6V/cell)	State of Charge (% of full charge capacity)
2.14-2.15	12.84-12.90	6.42-6.46	100
2.12-2.13	12.72-12.78	6.36-6.39	90
2.11	12.66	6.33	80
2.09	12.54	6.27	70
2.07	12.42	6.21	60
2.05	12.30	6.15	50



Sealed Performance Batteries

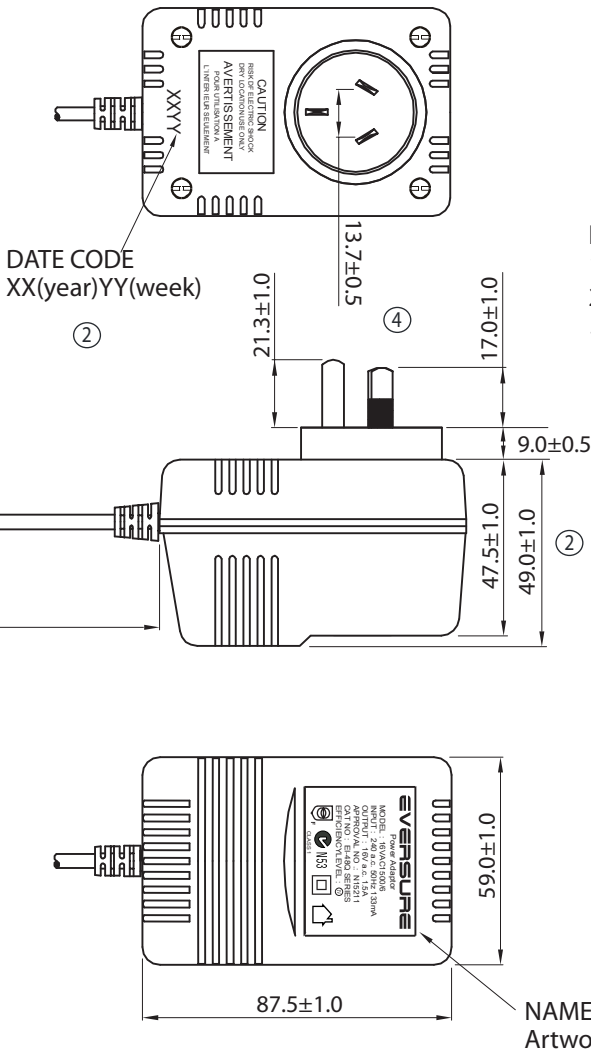
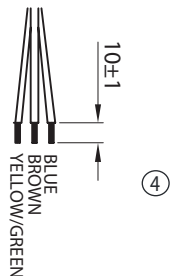
Domestic Sales | Ph: +61 (0)7 3386 1102 | Fax: +61 (0)7 3102 9913

sales@spb.net.au | [www.sealedperformance.com.au](http://www.sealedperformance.com.au)

National Warehouse | 1 Ant Road | Yatala, Brisbane QLD 4207

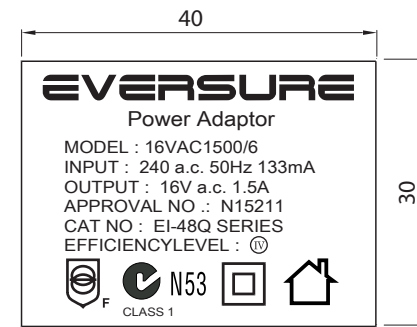
Melbourne Office | 2/9 Compark Circuit | Mulgrave, Melbourne VIC 3170





	REVISED	DRAWN	APPROVED
①	AMENDED PACKING QTY AND CARTON SIZE	JACKY 10/08/09	GARY 10/08/09
②	ADDED DATE CODE ON CASE AND DIMENSIONS	JACKY 07/12/09	GARY 07/12/09
③	ADDED PASSED LABEL ON CARTON	TODD 22/12/10	JACKY 22/12/10
④	AMENDED AC PINS DIMENSION & ADDED WIRES COLORS	ANLEI 01/11/12	ANLEI 01/11/12
⑤	CHANGED CROSS-SHAPED SCREW TO SHAPE  SCREW ON CASE	MARK 31/08/15	FREDERICK 31/08/15

- NOTES:
1. OUTPUT CORD: 20AWGX3C 1.83M Lead Free GREY (RAL7035)
  2. CASE: GREY (RAL7035)
  3. SECURITY SCREW IS AN ESSENTIAL REQUIREMENT, BOTH "" AND "" SHAPE ARE ACCEPTABLE



LABEL ARTWORK  
Black word on Silver base label

TE DRAWING NO: TE40-0001 R5					PART NO: 16VAC1500MPS/6					
DESCRIPTION: AC ADAPTOR EI-48Q, 16VAC1500mA, 3 WIRE - MEPS										
SIZE	A4	DATE	30/04/09	CHECKED	KEVIN 30/04/09		ORDER REF:	0420	SHEET 1 OF 3	TOLERANCES UNLESS OTHERWISE STATED X.= +/- .X.= +/-0.5 .XX.= +/-0.2
UNIT	MM	DRAWN	KEVIN	APPROVED	FRANK 30/04/09		CUSTOMER:	TE		
SCALE	NTS	MANU:				DATE:				



THIS DRAWING AND SPECIFICATIONS ARE THE PROPERTY OF TELEPHONE EQUIPMENT (NSW) Pty Ltd AND SHALL NOT BE REPRODUCED OR USED IN ANY MANNER WITHOUT THE PRIOR WRITTEN CONSENT OF TELEPHONE EQUIPMENT (NSW) Pty Ltd

ITEM	SPECIFICATION	
1. Primary rated input voltage	AC240V 50Hz 133mA	
2. Secondary rated output voltage and current	Unloaded voltage: AC 18 V ± 5% Loaded Voltage : AC 16 V ± 5% AT 1500 mA	
3. Ripple voltage	*** mV (RMS) MAX. AT Rated Loading	
4. Insulation resistance	Primary - secondary: DC 500 V 100 MΩ Min	
5. Dielectric withstand test	Primary - secondary: AC 3.64 KV 1 seconds	
6. Temperature rise	At rated loading 90°C max. For input coil (By resistance method) and 55°C max. on case surface (By use of thermometer)	
7. EFFICIENCY	≥ 79%	
8. Leadout	Primary	SAA PLUG IN TYPE
	Secondary	PVC cable length: 1.8 Meter Colour : GREY (RAL7035) Wire size: AWG#20/3C Plug : STRIPPED AND TINNED
9. Test circuit	<p>The diagram shows a transformer with a thermal fuse on the primary side. The secondary side is connected to a load circuit containing an ammeter (A), a voltmeter (V), and a variable load resistor.</p>	
10. Case	SAA48 colour = GREY (RAL7035)	

	REVISED	DRAWN	APPROVED
①	AMENDED PACKING QTY AND CARTON SIZE	JACKY 10/08/09	GARY 10/08/09
②	ADDED DATE CODE ON CASE AND DIMENSIONS	JACKY 07/12/09	GARY 07/12/09
③	ADDED PASSED LABEL ON CARTON	TODD 22/12/10	JACKY 22/12/10
④	AMENDED AC PINS DIMENSION & ADDED WIRES COLORS	ANLEI 01/11/12	ANLEI 01/11/12
⑤	CHANGED CROSS-SHAPED SCREW TO SHAPE  SCREW ON CASE	MARK 31/08/15	FREDERICK 31/08/15

TE DRAWING NO: TE40-0001 R5


PART NO: 16VAC1500MPS/6

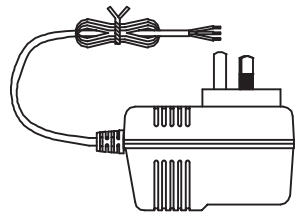
DESCRIPTION: AC ADAPTOR EI-48Q,16VAC1500mA, 3 WIRE - MEPS



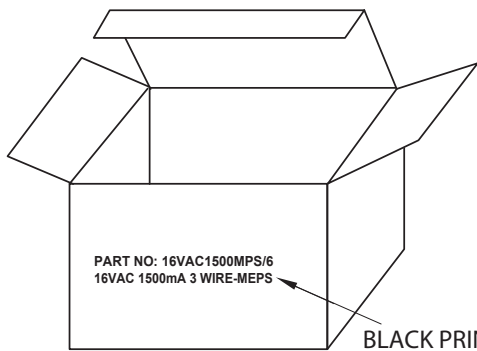
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SIZE	A4	DATE	30/04/09	CHECKED	KEVIN 30/04/09		ORDER REF:	0420	SHEET 2 OF 3	TOLERANCES UNLESS OTHERWISE STATED X.= +/- .X= +/-0.5 .XX= +/-0.2
UNIT	MM	DRAWN	KEVIN	APPROVED	FRANK 30/04/09		CUSTOMER:	TE		
SCALE	NTS	MANU:				DATE:				

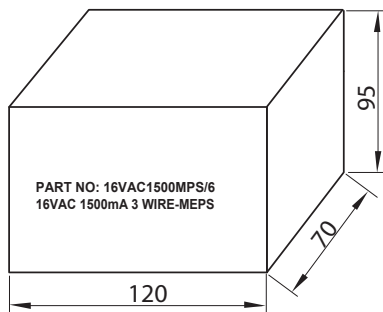
	REVISED	DRAWN	APPROVED
①	AMENDED PACKING QTY AND CARTON SIZE	JACKY 10/08/09	GARY 10/08/09
②	ADDED DATE CODE ON CASE AND DIMENSIONS	JACKY 07/12/09	GARY 07/12/09
③	ADDED PASSED LABEL ON CARTON	TODD 22/12/10	JACKY 22/12/10
④	AMENDED AC PINS DIMENSION & ADDED WIRES COLORS	ANLEI 01/11/12	ANLEI 01/11/12
⑤	CHANGED CROSS-SHAPPED SCREW TO SHAPE  SCREW ON CASE	MARK 31/08/15	FREDERICK 31/08/15



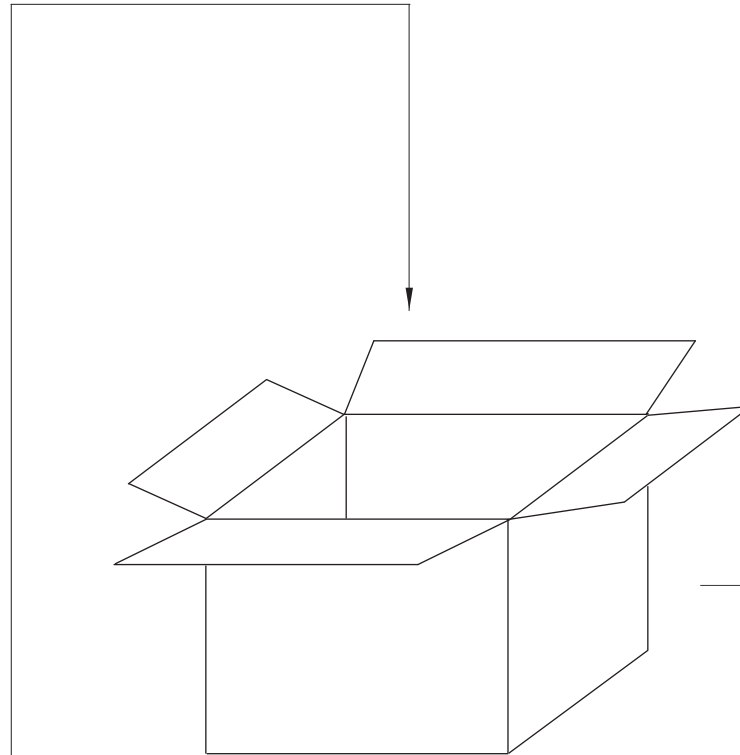
1 PC/WHITE BOX



BLACK PRINTING

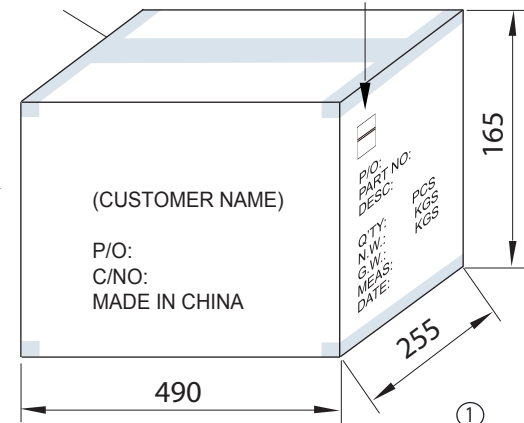


20 BOXES/CARTON ①



SHIPPING CARTON  
PLEASE FOLLOW ORDER TO PRINT SHIPPING MARKS.

ADHESIVE TAPE



③

ONLY ONE RoHS+PASSED LABEL ON CARTON  
RoHS LABEL(55X25MM)  
GREEN GROUNDING YELLOW TEXT  
PASSED LABEL(55X36MM)  
BLUE GROUNDING WHITE TEXT  
WHITE GROUNDING BLUE TEXT


①

TE DRAWING NO: TE40-0001 R5      PART NO: 16VAC1500MPS/6

DESCRIPTION: AC ADAPTOR EI-48Q,16VAC1500mA, 3 WIRE - MEPS



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SIZE	A4	DATE	30/04/09	CHECKED	KEVIN 30/04/09		ORDER REF:	0420	SHEET 3 OF 3	TOLERANCES UNLESS OTHERWISE STATED X.= +/-1 .X.= +/-0.5 .XX.= +/-0.2
UNIT	MM	DRAWN	KEVIN	APPROVED	FRANK 30/04/09		CUSTOMER:	TE		
SCALE	NTS	MANU:					DATE:			