

Metric Pay & Display Machines



Introduction

Metric Pay & Display Machines have been designed with the end user in mind. We understand from experience that our customers' requirements change as the traffic environment changes. A feature that was once considered unnecessary can later become vital. Metric has designed its Pay & Display machines to be the most flexible machines on the market today.

General design

The Aura and Accent machines conform to the current European standards including EN 12414 (Pay & Display machines), including all electrical regulations and applicable IEE standards. The Aura also complies fully with UK legislation on accessibility for disabled people.

Modular design

Both machines incorporate modular architecture, a design which allows the Operator to upgrade or maintain the machines by simply locating a new component into its bay. This modular system allows instant upgrading on-street. The system reduces down time and minimises the time that the internal components are exposed to the environment and weather.

All sub-assemblies are interchangeable between machines of the same type and model. The location system also requires no special tools. The cash box is common to both the Aura and the Accent model.

Cabinet design

The Aura and Accent Pay & Display machines have been designed to function in all climates without degradation and loss of performance. The case work is made of steel and chemically treated before being powder coated. This ensures that the machine is rust resistant.

The external finishes and steel treatment against corrosion meet European standards, with top coating completed in polyester powder coat paint. Most solvents used for the cleaning of graffiti can be used without any deterioration of the paint.

The machines are designed to operate in both cold and warm climates. Metric machines are in use in large numbers in tropical areas such as Southeast Asia. For cold climates the machines can be fitted with a heater to combat the build-up of moisture.

Upper Housing (Machine Cabinet)

The cabinet contains the control and ticket issuing equipment. All the electronic components, including coin selector, printer, display, communications board etc. are accessible from the upper housing. In this way an engineer can service and maintain the machine without having access to the vault.



The machine is designed so that it can be installed close to a wall. A small amount of space is needed on the side of the machine, to allow access to the locking mechanism.

The machine cabinet is constructed of 2.5mm welded steel with the door recessed into the cabinet. The door has a high security locking mechanism. The Aura has a double locking system, incorporating an electronically-controlled cover over a high security mechanical lock. The Accent does not have any form of electronic locking but is fitted with a similar mechanical lock.

The machine cabinet is bolted to its pedestal in several hardened locations. It can resist attempts by even the most determined and resourceful vandal to remove it. If the need arises to separate the machine from its pedestal, authorised persons having all the necessary keys can do this very quickly using ordinary hand tools.

The cabinet housing itself contains no money. The cash storage facility is securely encased in the steel pedestal. This means that engineers or Operator's personnel working on the equipment inside the machine pose no risk to security or revenue.

For user friendliness, the front of the cabinet incorporates a large information window. This window is resistant to breakage and can cope with solvents used in the removal of graffiti.

Lower Housing (Pedestal)

The cabinet is mounted on a pedestal which is constructed of 3.0mm welded steel. The pedestal is separated into specific compartments.

Aura: One compartment contains the coin return cup and (if fitted) the cardreader and/or notereader, one contains the coin box and one contains the battery and/or electrical safety switch.

Accent: One compartment contains the coin box and one contains the battery and/or electrical safety switch.

Access from one compartment into another is prevented by a steel plate.

The vault door is made of reinforced steel and is secured by a high security locking mechanism. The Aura has a vault door which is an integral part of the pedestal, with a unique electronic locking mechanism, controlled by the machine software. The Accent incorporates a high security mechanical lock surrounded by hardened steel plates. The key profile is not available to the public.

The electrical access door is located inconspicuously at the bottom of the pedestal. This door allows access to the mains power supply or the rechargeable battery. Access to this compartment does not affect the security of the cash box as the cash is stored in a separate compartment that is sealed off by a steel plate welded into place.

For the highest level of security, the pedestal is mounted onto a mounting cradle. This is first placed into a pre-dug hole and then encased in concrete. The concrete is then left to cure and then the pedestal is bolted onto the cradle. The foundation is then reinstated with all fastening points located below the reinstatement. This method leaves the assembly inaccessible to tampering and vandalism. If the bolt points need to be accessed, this can be done by authorised personnel who can open the electrical access door.

Access doors and locking systems

One of the key features of Metric P&D machines is security. All cash is safely stored in a steel coinbox which is locked inside the pedestal behind a high security vault door.

The Aura vault door is made of steel and composite ceramic, and is an integral part of the pedestal. When closed, it forms a smooth surface level with the casing of the pedestal. When opened it provides a shelf to assist withdrawal of the coinbox.



The Accent vault door is made of hardened steel 5-10mm thick (depending on specification) and is of 'A' frame construction, making it very difficult to force open.

Metric offers a completely versatile locking system: locks can be coded to suit a complete installation, or by zones or by individual machines. For example: For maintenance purposes, the Operator may prefer all cabinets to have a common lock but for security purposes the vault locks may be 'zoned'. Any permutation is possible. All locks are unique to the Operator and there are no master keys. Keys are delivered to an authorised person nominated by the Operator.

Lock details are as follows:

	<i>Aura</i>	<i>Accent</i>
Cabinet lock cover	Dallas	-
Cabinet	Kaba 20	Kaba 20
Vault	Dallas	Kaba 20
Coinbox withdrawal	Regent P10	Regent P10
Coinbox lid	Regent P10	Regent P10
Electrical Access	Regent P25	Regent P25

The Aura has a state-of-the-art processor-controlled locking system for the cabinet lock and the vault door, using Dallas keys. Each Dallas key is unique. To open either section of the machine, a Dallas key must be placed on the concealed sensor. The software checks its list of authorised key codes and, providing the code is included in the list, it identifies the lock and releases either the cabinet lock cover or the vault door in the pedestal.

Aura Cabinet door

If the key code matches the cabinet key file, the security system opens the cover to reveal a mechanical lock. The cabinet door then requires the use of a coded security key. Operation of this key releases concealed steel catches, allowing the door to be opened. This double security system prevents vandalism and renders the cabinet resistant to even the most determined criminal.

Aura Vault door

If the Dallas key code matches the vault key file, the electronic lock for the vault door operates, allowing the door to be opened manually. The door cannot be forced out and is counterbalanced to ensure smooth, trouble-free opening. This high-security system, controlled by the machine software, is resistant to any attempt to force it open. Tests have shown that the vault cannot be forced open without the use of highly specialised equipment, giving security staff ample time to reach the machine.

Accent Cabinet door

The Accent cabinet is fitted with a high-security mechanical lock which, when operated, allows a special locking handle to be used to open the door. The door has been designed to be almost impossible to force open and the full-length hinge and 4 locking catches are all concealed.

Accent Vault door

The vault door on the Accent machine is fitted with a heavy steel door 5-10mm thick (depending on specification) of 'A' frame construction, and a high-security mechanical lock. The lock is protected by a hardened steel boss and anti-drill plate. As an option, extra inserts can be fitted inside the pedestal to prevent drilling through the pedestal if required.

Electrical access door

The lower door on Metric Pay & Display machines, giving access to the mains electrical supply and/or to the battery, is fitted with a coded mechanical lock.

Cash storage

Coins

The Aura and the Accent use the same coinbox, a steel box which is locked inside the pedestal behind the vault door and encased in a steel sleeve. A separate key is required to extract the coinbox from its secure location inside the pedestal. The coinbox lid automatically locks upon removal from the pedestal. The coinbox can then be taken to a cash office where an authorised person can use a third key to access the coins inside. The coinbox lid must be opened and reset before the coinbox can be re-inserted into a machine.



This high-security coinbox system requires a supply of spare (empty) coinboxes. The number of spare coinboxes required depends on the frequency at which coinboxes are withdrawn from machines.

Banknotes

A banknote reader can be installed in the standard Aura pedestal (this must be defined as part of the machine specification). The note box is located at the side of the coinbox, behind the vault door. A banknote reader is also available for the Accent machine but this requires a non-standard pedestal.



It should be noted that Metric P&D machines do not give change.

Power supplies

Metric P&D machines are designed to be operated by a 12V DC supply from an internal accumulator. The accumulator can be recharged by:

- solar power
- external 240V AC (or 110V AC) power supply
- external recharging (replacement)
- other power supply (wind turbine etc)

An AC supply can be either direct from mains cables or from street lighting power circuits. If the power supply fails, the machine will continue to function normally for several days, depending on the size of the accumulator and its state of charge.

The machine can be configured to run on any of these power supplies or a combination of these, by simply changing the connections to the internal accumulator battery and alerting the software to the power change.

The state of the accumulator and its charging rate are constantly monitored by the machine software, which has a power threshold detector to trigger an LED warning if the battery power falls below a preset level. The machine will continue to issue tickets until the battery power drops to a second threshold, at which point a red LED will show and the machine will put itself out of service automatically. These 'events' are logged in the machine software for future reference and can be sent via GSM/GPRS direct to a central computer if required, to request immediate attention.

If the accumulator is recharged regularly, so that the power never drops to the threshold level, it should last many years without attention. However, if a substantial power drain is expected (for example: a heater in the cabinet or pedestal or a 230V AC light) it is recommended that the machine is connected to a 230V/110V AC supply, so that this can be used to supply any power-hungry unit.

All Metric P&D machines meet the relevant European regulations regarding electrical safety, radio interference and electromagnetic compatibility. To ensure that compliance is achieved on-street, it is essential that all machines are properly earthed when they are installed, both to eliminate any danger to the user and to prevent static electrical surges from damaging the machine electronics.

Function modes

Metric P&D machines have been designed to function primarily in the standard Pay & Display mode, although several other modes are available to order:

Pay & Display - This is the standard mode: the user pays in advance for parking time. The machine issues a ticket which is displayed inside the vehicle and shows the parking time which has been purchased.

Space - Parking in a numbered space or bay, where the parker enters the space/bay number on the machine keypad prior to parking. A ticket can be printed as a receipt if required. The Parking Attendant can view information on spaces which have been paid for, either on the machine display or printed on tickets.

Network Space - Parking in defined spaces (as *Space*), where real-time on-screen data can be requested, to show the status of spaces at any time of the day (paid or not paid). The data can either be shown on a web page or printed out, giving immediate patrol routes for enforcement officials to check. Motorists can also buy extra parking time at any networked machine.

Registration - Pay & Display parking with vehicle registration. The user enters up to four characters of their registration number into the keypad and this is printed on the ticket. If the ticket does not match the registration number, a penalty can be issued. This discourages motorists from passing valid tickets to other arriving motorists and so increases revenue.

Network registration - Pay & Display parking with vehicle registration, as above, but the registration numbers are transferred to a central computer and relayed to all machines in a zone, at pre-set intervals. The software can be programmed to prevent a second ticket being issued with the same registration number, thus obliging motorists to move their vehicles after a defined period of parking time.

Pay-on-Exit - This utilises an in-list contained in the machine memory. In this mode, credit card details are taken on entering the parking area and the time of stay is calculated by re-inserting the card on departure.

Platform/Transport - In this mode, the user selects the destination or ticket type via the buttons, and then inserts money until the correct value is reached. The machine then issues the ticket(s) automatically. Options such as the number of trips, adult or child fare, zones travelled or a leisure ticket are available. The machine will display and print the destination purchased. This mode is generally used for urban transport systems such as bus or light rail, but it can be applied to many other applications.

Machine features



The machine cabinet and pedestal are available in a number of standard colours such as Blue, Green, Red, Black, Orange and Grey. Other RAL colours are available at extra cost.

Metric P&D machines accept payment with coins as a standard feature. Other payment methods are available, including banknotes, chipcards and credit cards. Machines can be supplied for card-only payment if required.

Metric Aura P&D machines

- allow payment by coins, tokens, banknotes, credit cards or smart cards (microchip).
- allow the cancellation of the current transaction and the automatic return of payment by coins or by card.
- have integral information labels
- have the following power supply options: re-chargeable batteries, mains power, solar power.
- have a capability for multiple tariff structures (linear or table structure).
- provide ticket printing using thermal technology.
- have a secure steel construction throughout.
- have full audit facilities

The following indicators and devices are placed on the front face of the standard Metric P&D machine:

- A slot for coins (and an additional slot for cards, if fitted).
- A Ticket exit slot.
- Command buttons, providing a variety of optional commands, such as Language Selection, Value for card payment etc.
- A clock which is easily visible.
- A “WARNING” indication and an “OUT OF SERVICE” indication (both designed to be understood by the operating company), indicating the need for maintenance or replacement of consumables (paper, etc.).
- An alphanumeric display to show the total payment, the time and day of parking expiry and tracking of card transactions.
- Clear, simple, prominent and unambiguous instructions for users.
- A keypad for entering additional data (if fitted).
- A button for cancelling the transaction and returning coins or card.
- A tray where coins are returned if a purchase is cancelled.



The Accent keeps a real time total of the coins as they are accepted into the coin selector. This information is then updated on the customer display. Payment for fractions of the authorised parking period is possible and up to 30 coins may be inserted. Parking expiry time is shown on the display and is printed on the ticket.

Any rejected coins are returned to the motorist in the coin return cup located below the operating panel.

The front panel of the Aura has been specifically designed to comply with European legislation concerning access and use by disabled people.

Front panel and display

Information panel

One of the key features of Metric P&D machines is the user-friendliness of the information on the front panel and the display. The information panel is easily accessible inside the cabinet door and any information can be displayed, simply by

printing the information label on a standard PC printer and inserting into the information window. This panel can provide permanent information including lists of coins accepted, tariff rates, instructions, symbols and pictograms, giving even those people who cannot read the text a basic understanding of the ticket purchasing process. The labels can be removed and replaced at any time, if the tariffs or specification change.

Display

The backlit display is clearly visible from all normal reading angles and shows messages on two lines of 16 characters each. The display includes a digital clock which can be reset either remotely or by authorised persons who have the machine keys and security code. The clock is displayed throughout the transaction process.

Dates for automatic time changes to allow for seasonal changes or daylight saving etc. can be programmed into the memory. Up to 10 years of holiday data can be programmed into the tariff structure. Leap years are calculated automatically.

Buttons

Up to eight buttons are fitted for use by the motorist (up to 5 buttons are available for the Accent), including a green button which is depressed to issue the ticket. Other button functions can include Cancel Transaction, Select Language, Select Category (for special parking rates etc), Select Purchase Value (for card payments) etc. The Cancel button can also be used to release jammed coins and return them to the motorist.

Metric P&D machines can function in up to ten different languages. Each language is selected simply by pressing a button. We offer most major languages including English, German, French, Spanish, Italian, Greek, Arabic, Russian and Chinese. This can assist foreign visitors immensely in making their ticket purchases.



Alphanumeric keypad (optional)

The machine can be supplied with an external alphanumeric keypad to allow the motorist to enter the vehicle registration number or other number (for example: parking space number). If the registration number is entered, it is printed on the ticket, thus preventing the ticket from being given to another motorist. It can also be stored in memory to prevent the purchase of additional parking time.

Coin system

Coin chute

Metric machines have been carefully designed to resist any attempt to defraud them. All machines are fitted with a novel 'clamshell' coin chute which opens if a jam is detected inside the chute and sweeps any debris away into the coin return cup. The coin chute itself leads the coins one way and then the other before reaching the validator. This design prevents objects such as wire from being pushed into the coin system. As a result of this design, a shutter over the coin entry slot is unnecessary, so the machine is always ready to accept payment.

If the 'clamshell' mechanism is unable to clear a jam in the coin chute for any reason, this will be detected by sensors and the machine will be put out of service.

Coin validator

The coin validator can check up to 15 denominations of coins and is completely programmable. All major currencies can be accommodated. The validator can be programmed to accept more than one currency; if programmed this way, the machine will accept a combination of coins of more than one currency for a single transaction. The validator can be removed in seconds, without the use of tools, for checking and servicing.

If the machine is fitted with a banknote reader, this can check up to 6 different types of banknotes in all orientations.

Metric Pay & Display machines have been specifically designed to resist attempts to defraud them. The coin validator carries out a large number of checks on each coin. Objects which are not recognised as legal coins are rejected after passing through the validator. Similarly, any banknote which is judged invalid is rejected by the banknote reader.

Escrow

All authorised coins pass through the validator into the 'escrow' and are held there until the purchase has been completed by the motorist (including issuing the ticket). If the transaction is aborted the coins are returned to the motorist.

The Aura has additional anti-fraud systems, including sensors to detect whether the coin return cup has been wedged in the 'open' position, preventing returned coins from reaching the cup and causing a build-up of these coins which can be collected later. Any attempt to defraud the machine in this way can be notified immediately to the Operator's staff.

Card Reader

The Aura can accept payment using almost any type of card - debit card, international credit card, local purse card – and give a separate audit for each type.

Credit and debit cards

Transactions made with a credit or debit card are normally processed 'on-line', where the P&D machine automatically calls a central processing company when a card is inserted in the cardreader. All aspects of the payment process (validation, authorisation and transaction) are handled directly by the processing company, ensuring a high level of security. If the banks permit 'off-line' transactions, these can also be handled by the Metric machine; in this case the transaction data is held in the machine memory and is downloaded at a later stage. However, this process may be open to the risk of fraud. At the other extreme, banks in some countries are now using the 'chip and PIN' system, an on-



line transaction system where the user enters a PIN on a special keypad to request authorisation. The Aura can be configured to use this 'chip and PIN' system if required.

Pre-loaded smart cards

For the utmost convenience of both the Operator and the motorist, Metric P&D machines are capable of accepting a decrementing card system, debiting cash from a pre-loaded card. This system uses a secure memory card ('Smartcard'). These cards are laminated plastic with a secure memory chip, and can have a cash value encoded on the chip. The cards can be programmed with the Operator's unique authority code. They are available fully customised to meet the Operator's specifications. These cards have added security and information capacity and a significantly greater life span than magnetic cards. The smart card system means security for the machines and the public user. While providing the motorist with a convenient way to purchase parking, it takes cash off the street, making the machines and their users a less inviting target for thieves.

Smartcards can be recharged at a Metric machine on the street if this facility is required; however, we feel this can encourage extra vandalism by increasing the quantity of coins in the machine.

Cards can be used for various concessionary sectors of the public such as residents, commuters, Operator's staff etc. and to encourage their purchase a cash discount or additional time can be given. This option provides cash in advance to the Operator.

Other card systems

Metric is keen to supply 'user-friendly' machines which facilitate payment for parking, so we will consider adapting the Aura to accept any card scheme. This applies particularly to 'national purse card' schemes; examples include 'Cash' (Switzerland), 'Proton' (Belgium) and 'Chipknip' (Netherlands). We would welcome a discussion on specific requirements.

Tickets

Metric P&D machines use a thermal printer to print the ticket. This printer produces a clean, dry ticket, without the use of ink. The ticket is only printed when the motorist has pressed the 'ticket issue' button. An automatic guillotine cuts the ticket cleanly, so that it falls into the ticket chute and can be taken by the motorist.

Machines can be programmed to print a 'double' ticket, either joined or cut, or a 'stub' ticket (1½ tickets). The second ticket or the stub can be taken by the motorist and used as proof of payment (for example: to claim a refund of the parking fee).

When the number of tickets remaining in the machine reaches a minimum level (pre-set in the software), a yellow warning LED will be displayed to warn engineers that the ticket stock is low. If the machine runs out of tickets completely, the software will automatically put it out of service and refuse all purchases. A red warning LED will be displayed to warn engineers that the machine is out of service.

The following is typical of the printing on the ticket :

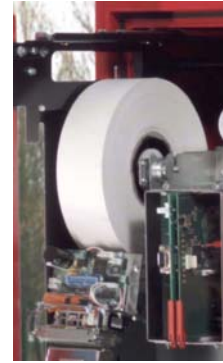
Date and time of expiry

10mm size characters

Fee paid	3mm size characters
Vehicle registration or Space number	3mm size characters
Machine number	3mm size characters
Street Name or other information	3mm size characters
Date & time of issue	3mm size characters
Tax (VAT, TVA, MWSt etc)	3mm size characters

Ticket stock

Tickets are available from two authorised suppliers –
 Nagelsdruck (Germany)
 Bemrose Booth (UK)
 Other ticket suppliers offer tickets for Metric machines but these have not been tested or approved by Metric.



In order to ensure that the print remains visible for long periods in sunshine, the approved tickets have special coatings designed to resist fading and moisture, and the thickness of the ticket is carefully controlled to avoid bending or curling in the sunshine.

The ticket can be plain or 'adhesive' (laminated). 'Adhesive' tickets have the advantage of an adhesive backing which is used to stick the ticket to the inside of the windscreen, ensuring it cannot fall or blow away. However, as laminated tickets are thicker, the number of tickets which can be stored in the machine is reduced.

The operator's name and logo can be pre-printed as a heading to the ticket. Advertising on the reverse will reduce the nett cost of tickets considerably (providing the space can be sold). All questions regarding the printing of tickets should be directed to the ticket supplier.

Ticket dimensions

Aura: The ticket size is 60mm x 59mm. Tickets are supplied on a roll. The normal capacity of a roll is 4,200 tickets (non adhesive) or 2,200 (adhesive). The number of tickets on a roll can be increased by reducing the ticket thickness but this may increase the possibility of curling in sunshine or jamming in the printer.

Accent: The ticket size is 70mm x 53mm. Tickets are fan-folded and supplied in cartons of 5,000 (non adhesive) or 3,000 (adhesive).

Second printer – optional in the Accent only

It is possible as an option to have a second printer in the Accent (this is not available in the Aura). This can be used in several ways –

- 1) To double the capacity of tickets to 10,000 (or 6,000). When one printer runs out of tickets the machine can be programmed to use the tickets from the second printer. In this way, all the tickets are used and maintenance is reduced.
- 2) To enable the machine to continue printing tickets, using the second printer, if the first printer is jammed or develops a fault.
- 3) To give the user a choice of tickets. This feature is often



used for transport tickets, where one printer may issue a single journey ticket while the second may issue a 'day' ticket or 'season' ticket.

Machine software

Tariffs

Parking tariffs are stored in the memory on the main processor board. A wide variety of tariffs can be stored, including linear tariffs (either progressive or degressive), short-stay tariffs, fixed-period 'table' tariffs, special tariffs for specific days in the week, free periods and closed periods. Machines can be programmed to apply an alternative tariff when a 'category' button is pressed or a specific type of card is inserted (for example: to allow residents a lower rate).

Holidays

A different tariff rate can be applied for holiday periods. Holidays can either be programmed individually up to one week before or can be pre-set in the software for 10 years in the future.

Change of rates

New tariff software can either be supplied by Metric or produced by the Operator using tariff editing software. This software will allow the Operator complete autonomy in editing the tariff structure. Tariffs can be loaded into the machine either directly from a standard flash memory card or through a hand-held computer or via GSM/GPRS communications.

Machine configuration

Machine software is available which enables two configurations to be stored, together with programmable dates for switching the machine configuration automatically from one to the other. This feature can be very useful in situations where a different tariff system should be introduced at certain times of the year or where parking zones may be changed.

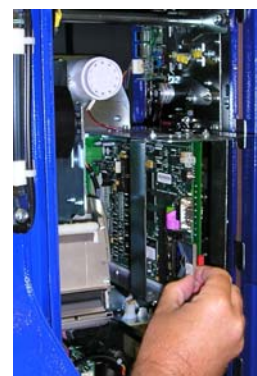
Data storage

All data, including machine software, tariff data and audit data, is stored in secure memory on the main processor board. This storage is backed up by a lithium battery which powers the memory chips in the event of the loss of the main supply and will keep the data secure for up to 5 years. Up to 32MB of transaction, event and fault data can be stored this way.

Downloading/uploading software

Machine software is normally loaded into memory from a standard industrial-quality flash memory card. Main tariff software is also loaded this way but some types of tariff software can be uploaded remotely using a GSM/GPRS connection.

The main processor board in the Aura incorporates a RS232 interface which can be used to connect a portable data capture device such as a hand-held computer. The Accent can also be



fitted with a RS232 interface as an extra option. The plug system gives a solid uninterrupted connection and a faster, more reliable data flow than alternative methods such as infrared.

The recommended data module is a PSION hand held device made of rugged impact-resistant plastic.

Some of the transferable and recoverable parameters are:

Upload

- Time and date
- Some on-site programmable parameters
- Tariff software

Download

- All cash transactions
- Off-line credit card transactions (if permitted)
- All machine events and fault records

Audit information

Metric's excellent accounting features make auditing more effective and less time-consuming. Data can be downloaded to a PC or printed out manually. For manual audit checks, the Aura and the Accent incorporate an internal keypad to access the machine memory and obtain information. When a simple numeric code is entered, the machine issues a precise audit on existing ticket stock. This information includes:

1. Subtotal of cash in cashbox
2. Subtotal of tickets of each value sold
3. Accumulative total of all cash taken
4. Total of all tickets sold.
5. Total of each value sold
6. Breakdown of each coin value
7. Cash Box total
8. Repeat of last ten cash box totals (optional)

To prevent fraud, a security code is required in order to zero any accumulative totals.

When the cashbox is withdrawn, an audit ticket is issued automatically, detailing the sequential number of the cashbox, the date and time of withdrawal, the cash amount in the cashbox, and the date and time of insertion. Other audit information can be added as required.

The audit, date and time information is maintained by a lithium battery, if mains power should fail. This gives protection for up to five years. All tickets are sequential for auditing purposes.

The system can also download all audit and statistical information to a Psion data capture module or directly to a PC via GSM/GPRS. It can then be loaded into spreadsheet software, enabling statistical analysis and reporting for management purposes.

Maintenance

The Metric Pay & Display system incorporates a status detection device which checks the machine continuously and reports its status every 20 seconds via LED indicators located on the machine door. A green LED indicates the machine is functioning normally. A yellow LED indicates that the machine needs attention (eg: tickets are running low, coinbox needs changing etc). A red LED indicates the machine is 'Not in use'. An authorised person having machine keys and the security code can find the exact nature of the fault by running a report, using the internal keypad. If required, the machine software can be configured to issue this report without the need to open the cabinet, by inserting a special token into the coin slot or a special smartcard into the cardreader, if fitted. The display then shows a brief description of the fault and the machine prints a test ticket. This ticket is not included in any audit report.

Tickets and coins

In addition to checking the number of tickets available, the status detection device also checks the status of the coinbox, measuring the volume of coins. When the volume reaches pre-set limits, the status indicator shows either yellow (for "Nearly full") or red (for "Full"). When the "Full" status is reached, the machine is put Out of Service. Any coins inserted when the machine is out of service are returned immediately to the user. Additional limits based on the value of coins in the coinbox can also be set in the machine software, if required.

Servicing

Metric machines have been designed to reduce the costs of servicing and maintenance. All modules can be easily replaced, enabling repairs to be carried out in the workshop, rather than on-street. MTBF (Mean Time Between Failures) is estimated at 40 weeks for a typical machine. A standard service requires about 40 minutes per machine and is recommended 2 – 3 times per year. However, in harsh environments (extreme heat, cold, dampness or salty conditions) we recommend a service 4 - 6 times per year.

Computer-assisted management

Audit data

The machine can be pre-equipped to allow accounting, statistical and maintenance data to be retrieved and transmitted to a central computer. Various methods are available for this. The simplest is a Pision data capture device. This is a hand-held computer designed to be used even in inclement weather conditions. This can be plugged into the machine and can be used to retrieve data from up to 44 machines at a time and store the data until it is downloaded to a PC.



The data can be downloaded into spreadsheet software for auditing and statistics purposes, and will provide information on ticket sales and currency breakdowns for management.

Automatic monitoring

Metric pioneered the concept of networking Pay and Display machines, to enable real-time monitoring of machine status. With over 100 major networked systems world-wide using our ASLAN system linking over 10,000 machines, Metric is the industry leader.

All machines are capable of being “networked” back to a central PC. The Metric ASLAN system is capable of recording and reporting all transactions at each machine and its status condition at anytime. Machines can instantly warn the Operator’s personnel of a fault or an attempted break-in. This way the whole Pay & Display system can be monitored in real time without staff having to leave the office.



Several methods are available for networking the machines together:

- Hardwire local area networks (Ethernet / optical fibre)
- Conventional public telephone system
- GSM or GPRS
- Wireless monitoring (WiFi)

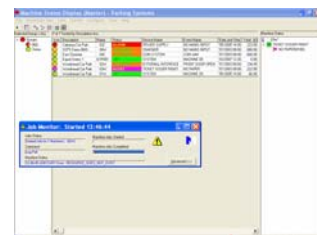
Metric generally recommend the use of the GSM cell phone network to communicate. GSM is well established in almost all countries and offers a low-cost reliable networking method. If networking use is likely to be high (for example: in space network systems where each transaction must be reported to the central computer) a GPRS or WiFi system is often preferred. The final choice would be that of the Operator and may be dependent on location of machines and radio signal strength and/or telephone line availability at each site.

Software for central management

The Metric Parking network system offers the following software packages:

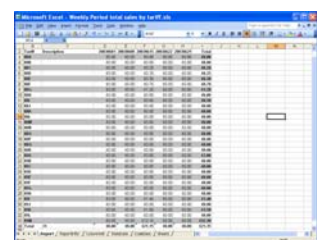
1. ALERT

This controls the communication between the machines and the computer and provides real time machine status (health check). There are more than 100 possible “status reports” from *low tickets*, *coinbox ¾ full* or *full* to technical fault conditions. A machine will call the PC as soon as it requires attention. Each call is dated, timed and located by name and serial number, with the event details. When the fault is rectified, the date and time of completion is recorded.



2. STATS

This enables full statistical analysis of audit data, including time band analysis of tickets sold per tariff and per machine. Reports can be produced based on number of tickets, value of cash and percentage of income. These can be filtered by dates, by day, by week, by month or by 3-month periods. Similar selections can be made for coin box totals and



machine events. All reports are compatible with MS Excel software and will help the Operator to make management decisions regarding parking rates and times, increasing the efficiency of the parking control system.

3. SPACE NETWORKING

In a 'Space designation' system, all data on the purchase of parking spaces can be transmitted to the computer at a pre-set frequency, enabling the Operator to monitor the status of spaces in a street, a car park, a zone or a complete city. This data can also be transmitted via GPRS to hand-held computers, providing 'live' data to the enforcement officers which enable them to target their enforcement, thereby increasing the efficiency of their work.



4. TARIFF EDITOR

This allows complete autonomy to edit a 'table' tariff structure, which can be uploaded either via a PSION handheld computer or by using the 'Alert' software via the network if available.

Paging

If network providers in your country offer a suitable 'paging' service, ALERT can be configured to use this service to send automatic messages to pagers or mobile phones. Any "event" that is recorded into the central PC is automatically dispatched to message pagers held by the car parking staff, supervisors, maintenance technicians, security office etc., showing the event code, time of event and machine location. In this way machines can be placed back into service as quickly as possible to maximise income.

Other options

Help point

If GSM is used as the method of transmitting data from the machines to the central PC, the modem in each machine uses the 'data' SIM for this purpose. The 'voice' SIM is also available and can be used to provide a 'Help Point' in each machine. This is an intercom system, which allows people in the street to communicate directly with a central office. This office may be the parking operator, the local Municipality, a Security Office or the police, depending on the use for which the intercom is intended. This system is in use in a number of towns and is usually installed to allow the general public to contact an emergency number. The 'Help Point' avoids the need to install separate intercom units in the street for this purpose. The uses to which this technology can be put are numerous and varied.



ANPR

Many private car parks are now using cameras to record the registration numbers of vehicles entering the car park (ANPR – Automatic Number Plate Recognition) and holding the numbers on a database. The Pay & Display machines can function in

'Network Registration' mode and send registration numbers to this same database. This system allows the operators of private car parks to control and limit the time which each vehicle spends in the car park. This system is very often used by large supermarkets.

Metric can offer several other options, including:

- Payment of penalty charges at the Pay & Display machine
- Linking of audits from several parking control systems, particularly cell phone payment systems
- Modification of machines for golf courses, boat marinas, toll roads, access control systems and other 'non-parking' applications

Metric will make every effort to supply equipment and systems which are adapted to our customers' specific requirements.

Technical specification

Aura

- MACHINE DIMENSIONS** 177cm high (including pedestal) x 40cm wide x 30cm deep
- MACHINE WEIGHT** 47 kg
- PEDESTAL WEIGHT** 73 kg
- POWER SUPPLY** 230v AC 50Hz or 115v AC 60Hz Single Phase with 12AH battery back-up; standalone battery operation (38AH) or solar power with 38AH battery back-up
- OPERATING VOLTAGE** 12v DC
- OPERATING TEMPERATURE** -20 °C to 60 °C (-25 °C to special order)
- HUMIDITY** Up to 95% RH (non condensing)
- SOLAR PANEL** 10W power rating
- PAYMENT SYSTEMS** Coins, Banknotes, Magnetic Cards, Chip Cards, Tokens
- COIN ACCEPTANCE** Electronic up to 15 denominations of any legal currency
- ELECTRONIC CONTROL** Microprocessor-based with machine software held in on-board flash memory and statistical information in RAM, with lithium battery back-up
- CASEWORK** Welded reinforced treated steel
- PEDESTAL** Welded reinforced treated steel. Internal hardened steel plates available as an option
- VAULT DOOR** Reinforced vault door with combined material protection
- TICKET PRINTING** Thermal printer providing graphic printing 8 dots/mm
- TICKET CAPACITY** Paper roll, 110 micron, up to 4,200 tickets per roll
- SINGLE TICKET SIZE** 60mm x 59mm
- BACKLIT DISPLAY** 240 x 64 dot graphic LCD, language specific programming capability
- SECURITY** High security locks used throughout; full electronic locking to vault door; electronically controlled cover to high security lock on cabinet door; all keys unique to purchaser; 105 db Intruder Alarm
- COIN BOX** Coin box is self locking on removal; capacity 6 Litres (4 litre optional)
- HEATER** Thermostatically controlled heater in cabinet on mains powered machines
- STANDARD COLOURS** Black RAL9005, Grey RAL 7012, Blue RAL5002, Red RAL3003, Red RAL3020, Green BS381C_226, Orange BS4800_06E51, Blue BS4800_18E53
- Anti-graffiti coating available as an option
- NETWORKING** Machines can be linked to a central computer utilising the **Metric Aslan** software suite
- AUDIT STATISTICS** Full range of audit statistics available at the machine; download facilities available as an option

Metric has a policy of continuous product development. These specifications are correct as at February 2008 but all specifications are subject to change.