IPS Single-Space Parking Meter M5:

User's Manual

Version 1.0

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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 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

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

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INTRODUCTION

The IPS Single Space Parking Meter (SSPM) is a revolutionary product designed to enhance a city's current single space parking system by providing additional payment options (such as credit card), access to real-time data (via web-based management system), without disruption of current parking meter operations.

The primary features of the IPS credit card enabled single-space parking meters include:

- IPS single space parking meters are capable of accepting payment via coins, tokens, credit cards, debit cards, and smart cards at the meter terminal
- IPS single space parking meters are wirelessly networked and connected to a web-based management system – no additional customer software other than an Internet browser shall be required. The meter communicates in a similar fashion to a cell phone, and makes calls under a number of scenarios including: (1) credit card use, (2) fault notification, or (3) schedule daily call-in
- IPS single-space parking meters use a solar panel and rechargeable battery-pack to provide ongoing power and backup power
- IPS single-space parking Management System can wirelessly notify parking operations staff of any meter faults via a text message, email, or both
- IPS single-space parking Management System provides a variety of reports detailing financial, technical, and administrative functions via a single web-portal, including but not limited to credit card reconciliation, cash collection reports, coin box level (% full), and GPS location of meters. (Please refer to the management system user manual for complete details)

While the meter does provide a number of advanced features, it functions very similarly to current electronic single-space parking meters, making implementation of this system easy and intuitive.

Enclosed in this manual you will find everything you need to acquaint yourself with the primary operating features of this meter, as well as the basic maintenance activities that you will encounter. IPS welcomes customer feedback as part of the evolution of this product, so if you have any questions or concerns, please contact IPS directly:

Phone: (858) 404-0607
Email: support@ipsgroupinc.com

BASIC METER OPERATION

Turning the Meter On and Off

To turn the meter on, first make sure that the jumper (the small black plastic piece next to the battery connector) is inserted over both pins. Once this is connected, the meter should turn on automatically. If not, insert any card into the card slot until the display turns on.

To turn the meter off, hold down the diagnostics button (Please refer to page 7) below the keypad until the display is off. An additional way to turn the meter off is to use the meter diagnostics card, go to the SLEEP display screen and press OK to put the meter in sleep mode (turns meter off as well).

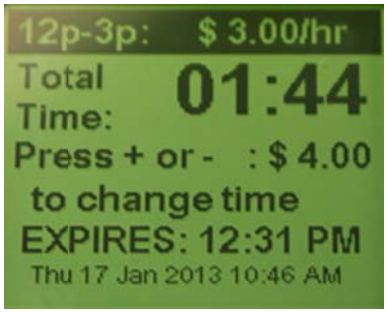
Coins

To make a payment with a coin, follow these steps:

1. Insert coins and/or tokens into the coin slot.
2. Display shows paid time and expiration time.
3. Metering begins once payment is complete.

Credit Cards

To make a payment with a credit or debit card, follows these steps:



1. Insert credit card and quickly remove it.
2. Choose amount of time using blue buttons (+ for more time, - for less time).
3. Press the green ‘OK’ button once desired time is displayed on the screen or red ‘Cancel’ button to void the transaction.
4. Wait for verification.
5. Metering begins once payment is complete.

Even if the payment is not confirmed, by pressing the OK button, the meter will time out, process the payment, and give the indicated parking time.

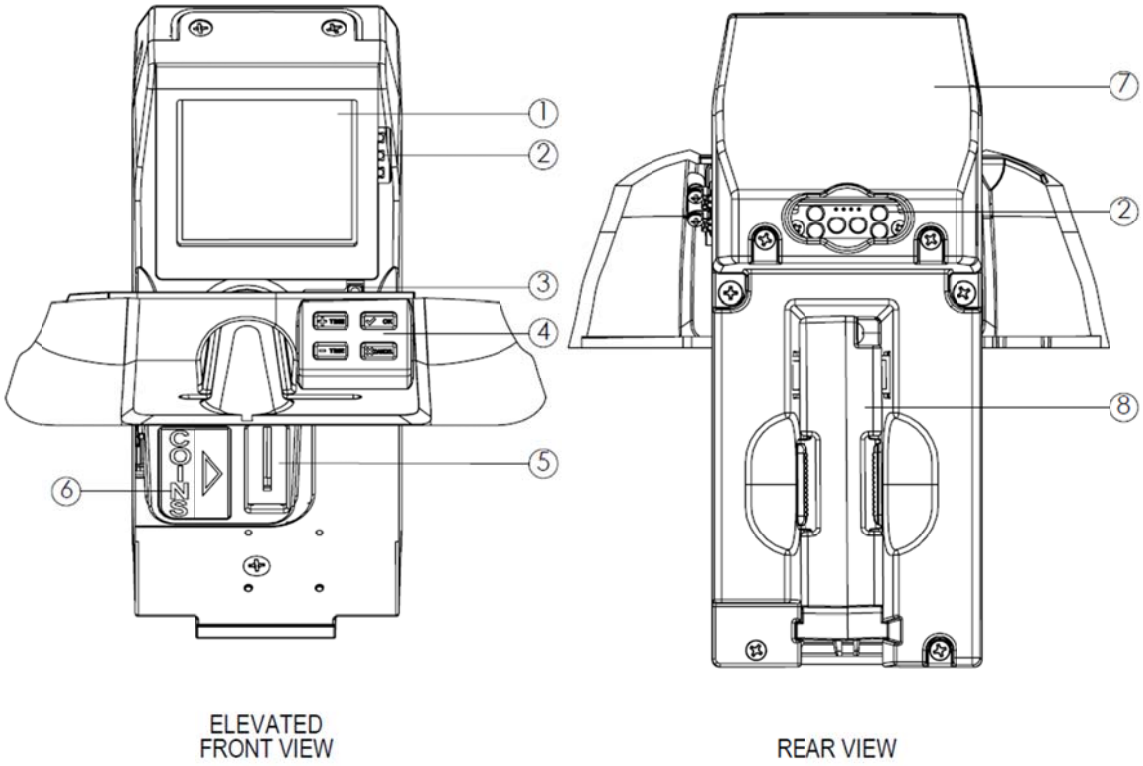
Smart Cards

To make a payment with a smart card, follow these steps:

1. Insert the card chip-side up. The meter will display the remaining balance on the card.
2. Choose amount of time using blue buttons (+ for more time, - for less time).
3. Press ‘OK’ once desired time is displayed on the screen or ‘Cancel’ to void the transaction. Follow the instructions on the screen and do not remove the smart card until instructed to do so. The screen will display the amount deducted from the user’s smart card as well as the remaining balance.
4. Metering begins when ‘OK’ is pressed.

If a card is left inside the meter, the meter will alert the motorist with a series of beeps. If it is not removed, the meter will report a card jam.

PARKING METER FEATURES

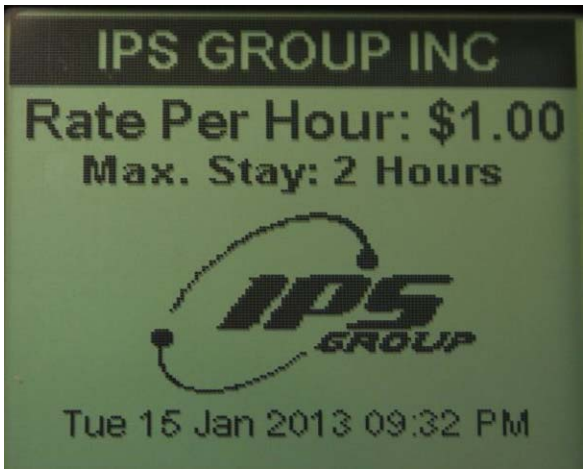


MK5 Parking Meter Features

Part Descriptions
1. Display
2. LEDs
3. Diagnostic Button
4. Card Entry Slot with Keypad
5. Coin Entry Slot
6. Coin Decal
7. Solar Panel
8. Coin Validator with Anti-Fishing

Display

The display is designed to be simple and user friendly, while providing key information to both the motorist and enforcement officers. The M5 LCD is 160 X 160 pixels versus the M3 display screen which was 132 X 64. The messages displayed on the backlit LCD are fully programmable to provide rate information, parking time limits, and time remaining on the meter. With the M5 screen, there is now the capability to have images as well (See below example). Alternating screens allow for a variety of programming options. The displayed messages can be updated remotely at any time via the web-based management system.



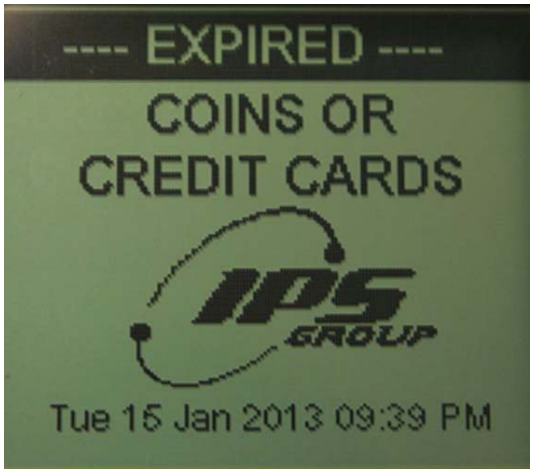
The meter operates in one of the following five states:

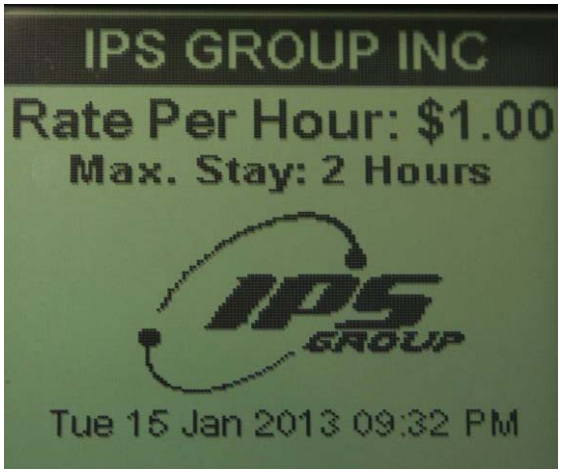
- Idle/Expired
- Paid
- Faulty
- Prepay
- No Payment Accepted

The following images and descriptions highlight the default message settings.

Idle/Expired

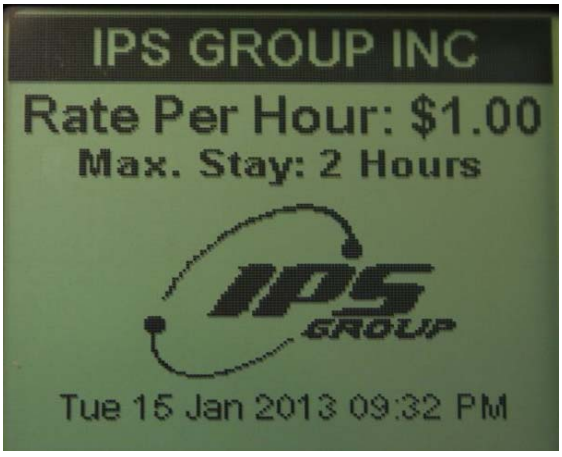
An expired meter alternates between displaying the rate and time limit information as well as the available payment options. (Please see images on following page)





Paid

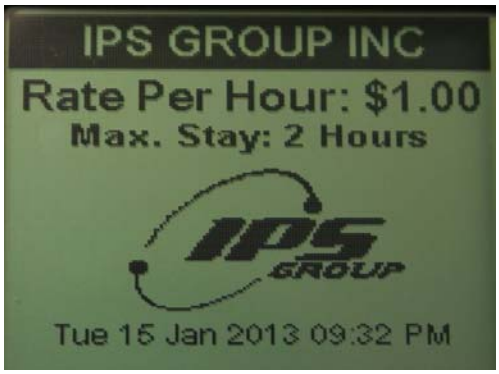
A paid meter displays the rate and time limit information while the alternate screen shows the remaining time (in the HH:MM format) and the expiration time. An optional setting in the management system is available to display negative time during grace mode or once the meter is expired.



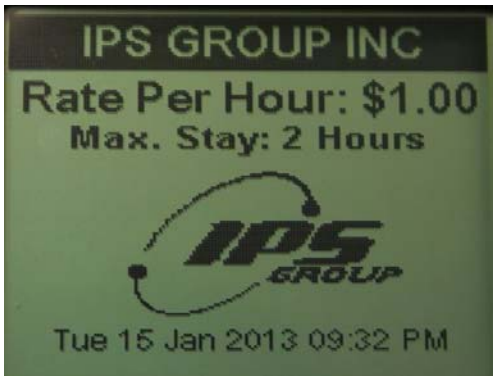
Faulty

There are three types of meter faults that will be displayed: **Cards Only**, **Coins Only**, and **Out of Order**.

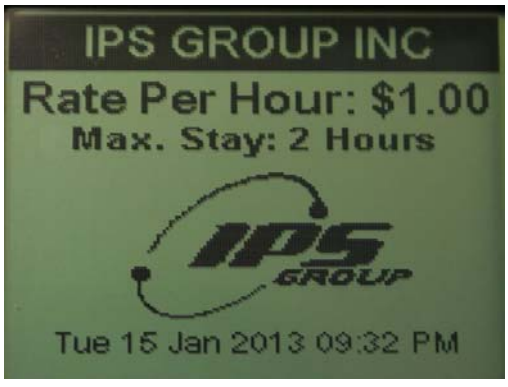
When a coin jam is detected, credit cards will still be available as a payment option:



When a card jam is detected, coins will still be available as a payment option:



When both payment options are unavailable, the meter will display the message below:

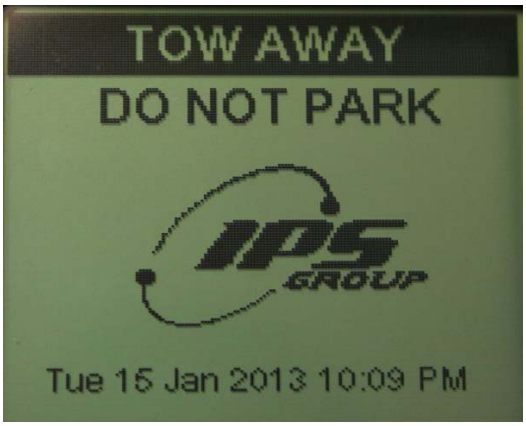


Prepay

The meter may be programmed to accept payment prior to the start of enforcement on any given day by setting up a prepay period. The actual paid time begins when enforcement starts but the meter displays the purchased time in addition to the time between the transaction and the start of enforcement.

Payment Not Accepted

There are two situations where payment is not accepted: Free Parking and No Parking. In both cases, when a coin or card is inserted, the meter will ignore the payment and continue to display the appropriate screen. The **Free Parking** display is typically used when parking is not enforced. The **No Parking** display is used for Tow-Away or Street Cleaning. The messages for these time periods can be customized as necessary.



LEDs

The LEDs on the back of the meter (below the solar panel) and in the front, to the right of the display, are intended to indicate the state of the meter. The Hi-Brite LEDs on the rear allow for easy, in-car meter enforcement while the front LEDs provide a good indicator for motorists and on-foot enforcement personnel. Typically, these lights are turned off outside of the hours of enforcement to conserve battery power.

The LEDs on the front and rear of the meter operate the same way. Below is the default configuration for the LEDs. These operating features can be modified via the management system.

No Parking/After Hours

The LEDs will be off during non-operational hours.

Idle/Expired

When a meter is expired, the RED LEDs will flash.

Paid

When a meter is paid, the GREEN LEDs will flash

Out of Order

When a meter has a card and/or a coin jam, both AMBER lights will flash.

Keypad

The M5 keypad has four, push buttons: + TIME, - TIME, OK, and CANCEL. They are used for credit card, debit card, and smart card transactions. After a user inserts and removes a card, he or she will have the option of adding more time by pressing the + TIME button, choosing less time with the - TIME button, canceling the transaction using CANCEL or confirming it by pressing OK. These buttons are not required for coin transactions. The buttons are also used to navigate through the various diagnostic options (discussed below).

The IPS M5 uses mechanical buttons rated at more than 200,000 cycles, which translates into more than 10 years of use. The buttons are also completely environmentally sealed to prevent moisture from affecting performance. The buttons are both labeled with symbols, words and are color coded to provide the most intuitive user experience possible. Additionally, the labels on the buttons are cast (imbedded) completely through the button so that wear and tear will not result in the label degrading over time.

Primary Function:
(+) Add more time to a credit card or a smart card transaction in increments defined within the meter management system.
(-) Subtract more time to a credit card or a smart card transaction in increments defined within the meter management system.
(OK) Confirm the amount of time to be purchased on a credit card or smart card transaction.
(X) Cancel a credit card or smart card transaction before the transaction has been confirmed.

Secondary Function:
(+/-) Buttons can be used to scroll up or down through the meter diagnostics menus.
(OK/X) Used to enter into and exit from specific diagnostics menu capabilities

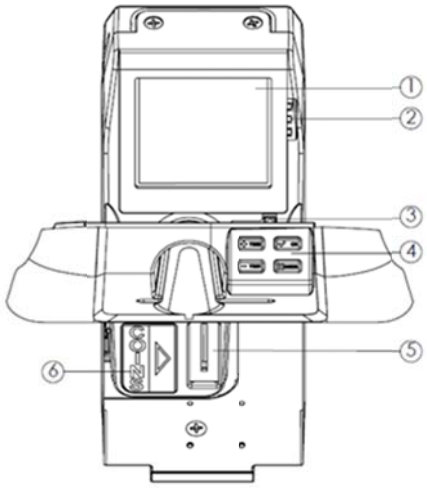
Tertiary Function:
(OK) If configured, can be used to allow the public access additional information screens on the meter

**Note as of now, IPS will be sending the card entry slot with keypad as a replacement. This can be subject to change.

Diagnostics Button

The Diagnostic Button is located on the right side of the meter, just below the keypad. The button has several uses:

a. Press the button once to access Diagnostic Mode.
b. Press the button once and press Cancel to take time off the meter.
c. Hold down the button for several seconds to power off the meter.



ELEVATED
FRONT VIEW

Card Entry Slot / Card Payment

In order to pay with a credit card, the motorist must insert a card into the card slot insert and remove it. This slot will accept standard-sized credit, debit, and smart cards. The proper way to insert a card is with the magnetic stripe down, on the right hand side of the card entry slot (see illustration on the left).

A card is also used to turn the parking meter on. If the meter is off, insert any card into the slot and remove it once a beep is heard and text appears on the screen.

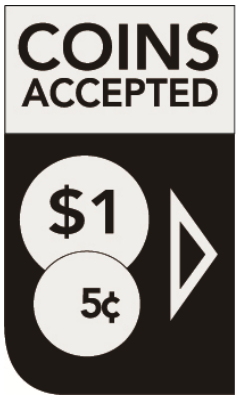
Coin Entry Slot

Motorists use coins in the same fashion as older, coin-only parking meters. When a coin is inserted, the amount of paid time appears on the screen. After the meter detects that no additional coins are added, the paid time is displayed on the meter.

The coin entry slot can easily be changed to accommodate various coin sizes or be sized to prevent certain coins from being used (such as $1 coins). If an alternate coin slot is required to adapt to new coin acceptance policies, please contact IPS to purchase new coin slots. The two (2) primary options are slots that accept all coins (including $1 coins) and those that do not accept $1 coins.

Payment Method Decal

Below are the most commonly used payment method decals. However, customer-specific decals can be purchased when ordering.



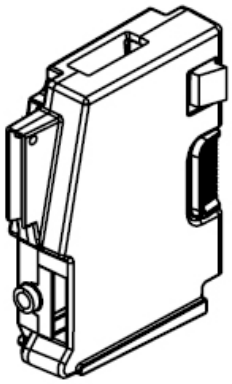
Solar Panel

The solar panel on the back of the meter acts as a continuous source of power for the meter's rechargeable battery. The panel should remain unobstructed in order to allow for maximum light exposure. Although it does not require direct sunlight to be operational, the solar panel should be free from any graffiti or obstructions in order to maximize battery life.

Additionally, if a meter will be bagged for longer than a 48 hour period, IPS recommends that it be turned off to prevent the battery from discharging, as the bag would prevent the solar panel from receiving light necessary to maintain the battery's charge.

Coin Validator

The coin validator is a removable component of the meter that differentiates the coins inserted into the meter based on a variety of attributes. The validator utilizes optical sensors to detect blockages caused by both metallic and non-metallic objects. Jams are reported wirelessly to a distribution list established by the user. This allows for a more rapid response to affected meters and results in increased meter uptime and revenue.



A variety of coins or tokens can be programmed into the meter as required. Additionally, known slugs or coin-like objects commonly used to defraud the meter can be specifically targeted and programmed to be rejected. The M5 coin validator has a stronger connector making it more difficult to secure.

RFID

IPS meters use an RFID (Radio Frequency Identification) tag installed in the meter's housing to identify themselves in the management system. The RFID tag is a unique serial number that allows the meter to be automatically associated with the proper pole or location. Each tag is assigned to a pole in the management system. When a meter transmits the RFID number with which it comes in contact to the management system, it gets linked to the pole to which the RFID number is assigned. This allows for easy installation and tracking of the meter within the system. The RFID tag does not store any information. It simply acts as a link between the pole in the field and its defined location in the Management System.

DIAGNOSTIC MODE

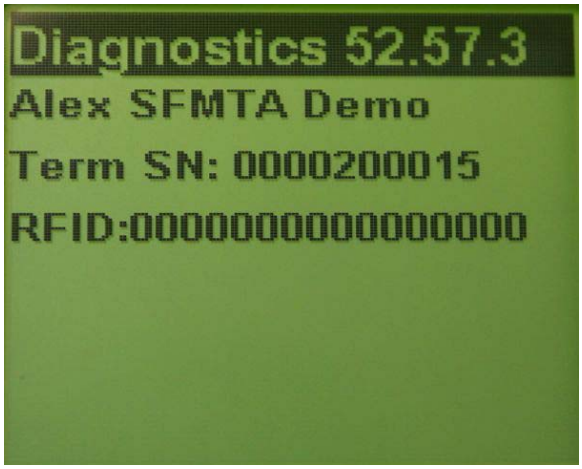
The meter's diagnostic mode is a useful tool for determining meter issues and preventing potential problems in the future. Use the + and – keys to scroll through the various menus. To enter a menu item, press the **OK** button. To exit out of the menu, press the **CANCEL** button. To completely exit Diagnostic Mode, press the **CANCEL** button several times until the meter is in the operational mode. If **OK** is pressed on a menu item that has no further information or options (such as Software), the Cancel key must be pressed before other menu items may be accessed.

Menu Name (red box)
Menu Item Number(blue box)

Note: Each meter is individually configured and thus may have different menu items available than the ones described below.

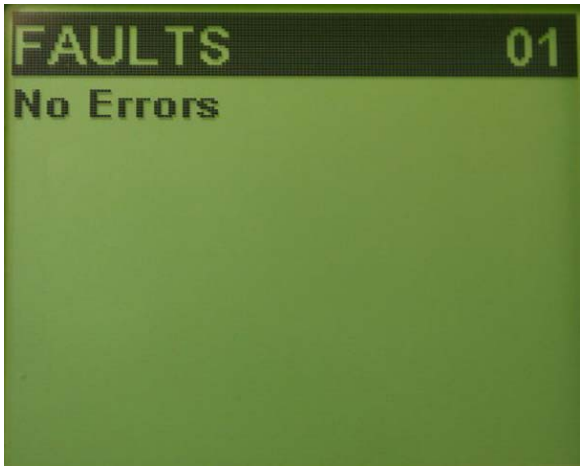
Main Screen

Once diagnostic mode is entered, the first screen displayed (above) will show the firmware version (top), the name of the meter's current configuration will be below, terminal serial number (which should match the number on the sticker on the top of the meter), and the pole's RFID tag number.



Faults

This menu will display any errors reported by the meter. When an error occurs, a message is sent from the Management System to maintenance staff via SMS or e-mail. The message indicates the type of error that occurred, the time, and the location.

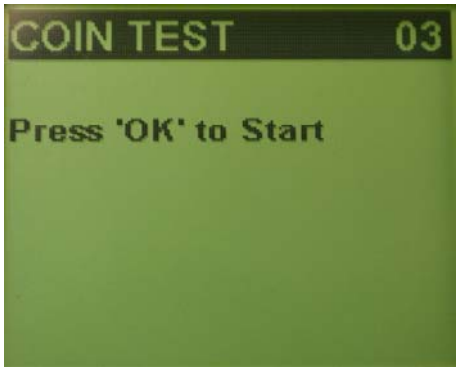


Here is a sample message generated when the meter detects a coin blockage:

"Coin Blockage at Pole Serial Number X-YYY (Terminal Serial Number 0012345)" (Refer to the index for a complete list of codes).

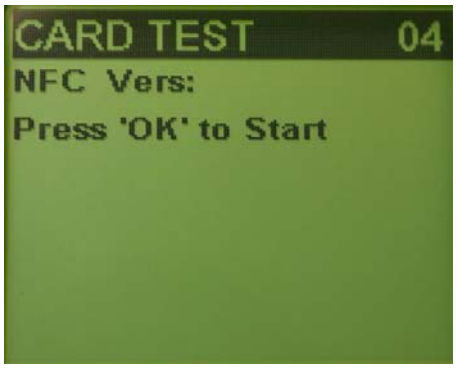
Coin Test

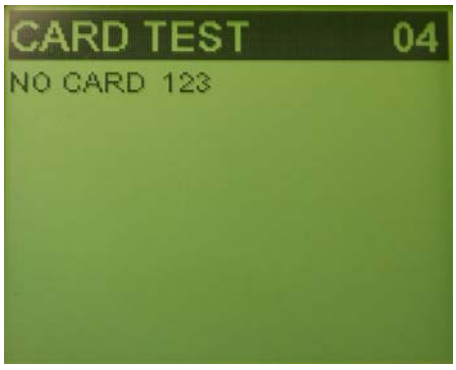
The coin test menu allows maintenance staff to verify that coins are validated correctly. The two key components in coin testing are the ***Coins***, which shows the total coin count and ***Value***, which is the value of the last coin inserted. When a coin is inserted, the ***Coins*** number will increase by 1 and the value will reflect the new coin. A number with a negative value will appear if that coin is not accepted (such as a penny). If a coin is inserted but the ***Coins*** count does not change, this may indicate a fault with the meter or the coin validator. Also if the value given for a particular coin is incorrect, the meter may not be programmed correctly.



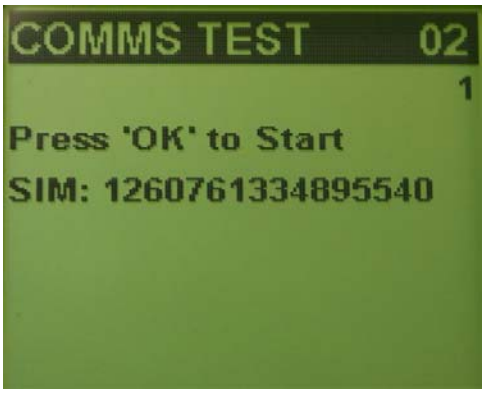
Card Test

In order to verify that a card is being read properly, it can be tested in the ***Card Test*** menu. Once in this menu, insert and remove a card. The credit card type, number, and expiration date should appear on the screen. This information will not be seen if the card reader is malfunctioning or if the card is damaged.

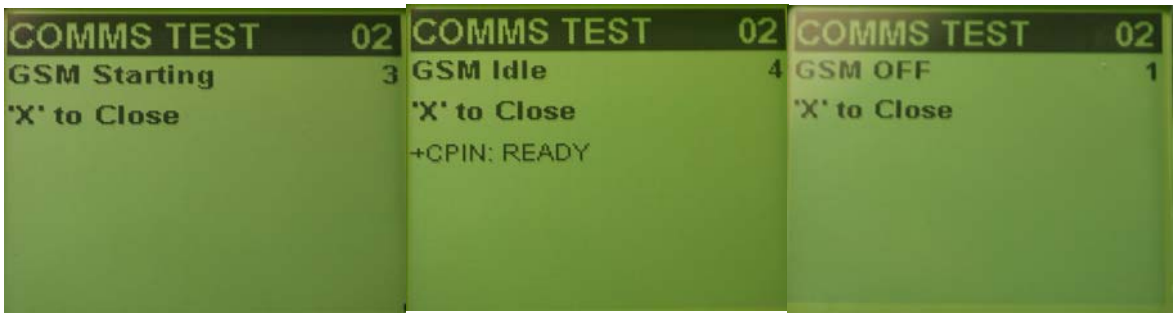


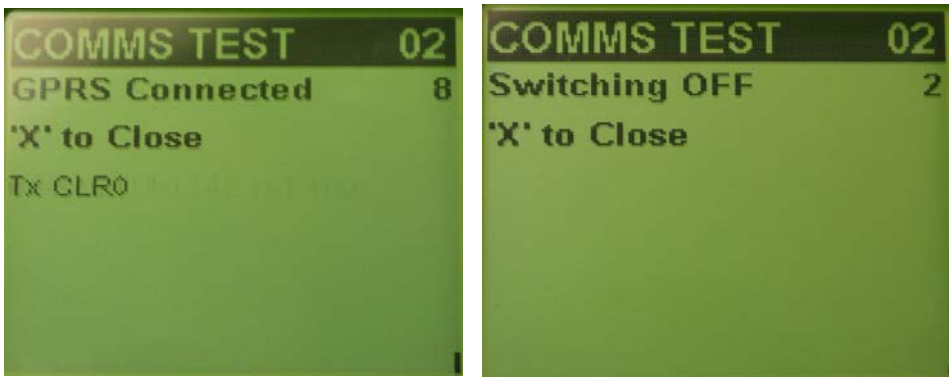


Communications Test (Comms Test)



This menu will allow you to test the meter's communication capabilities by forcing it to "call-in" to the management system. The meter uses GPRS (**General Packet Radio Service**) technology to communicate over the GSM (**Global System for Mobile Communications**) network. Performing this test verifies that the meter can successfully communicate with the management system, updates the meter's internal clock, and forces the download of available firmware and configurations. A typical communication session will go through the following steps:

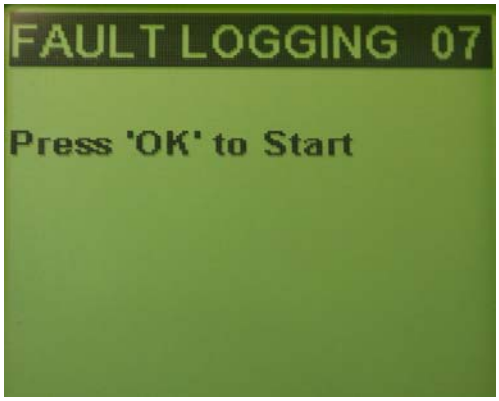


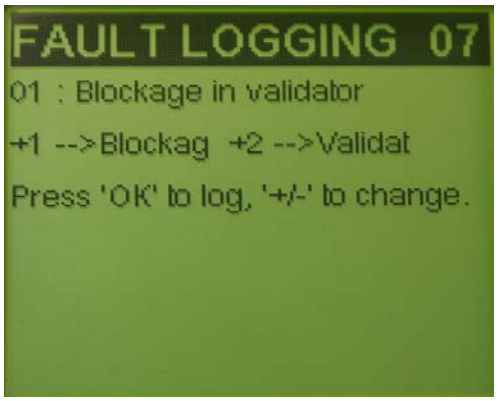


The bottom row of each screen will display the information that is being transmitted or received. Please refrain from pressing any buttons during the comms session so as to not interrupt the transmission. If at any point, *Error* appears on the screen or *Connected* is not seen, there is most likely a communication error either due to a faulty communication module or a network error. In either case, be sure that the test is being performed in an area with good signal strength and attempt the communication session again. See the Troubleshooting section for ways to resolve communication problems.

Fault Logging

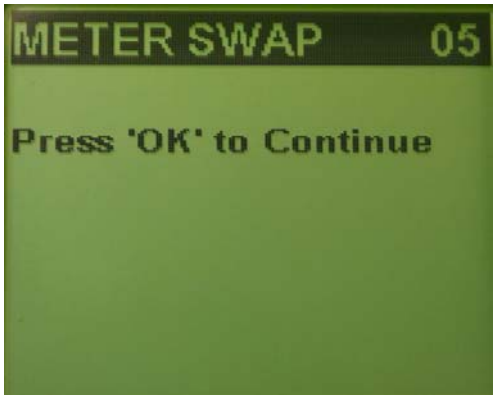
In order to simplify maintenance procedures, a fault logging feature is available for use on the meter. A fault can be logged at the meter and wirelessly transmitted to the management system thus eliminating the need for a handheld. To use this feature, scroll through the available options by pressing + or – and press OK to log the desired fault. Please contact IPS to customize the fault list.

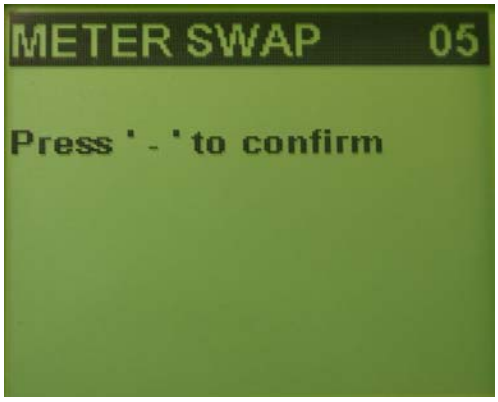




Meter Swap

When changing the meter mechanism, use the 'Meter Swap' option. This will start the communication session and reset all usage information. To use this feature, press OK once the Meter Swap menu is displayed on the screen, and press the – button to confirm. The meter will exit out of Diagnostic Mode and complete the communication session in the background.





Voltages

The IPS SSPM, which is powered by battery, has a rechargeable cell and a non-rechargeable pack. The M5 batteries are designed to use energy in an efficient manner. The rechargeable cell is constantly recharged by the solar panel. The non-rechargeable pack is used when the main battery voltage is too low and there is not sufficient power coming from the solar panel. Once the power of the backup battery is exhausted, it will no longer be functional and should be replaced. Ultracapacitors have also been included to supplement the batteries. These are most beneficial in cold temperatures but always store power.

The rechargeable battery is normally a lithium polymer or lithium-ion cylindrical type, which is typically recharged from a solar panel. The non-rechargeable battery is normally lithium-thionyl chloride (Li-SOCI2) cells designed as a backup for when the rechargeable battery becomes discharged.

The M5 as well as the other SSPM can also use standard off-the-shelf batteries; however, in order to have maximum capabilities, IPS recommends using our IPS battery packs. Please note that if you would like to use off-the-shelf alkaline cells, there must be a special battery case to hold the alkaline cells.

The ***Voltages*** menu displays information for the power sources in millivolts (mV). ***Solar Panel*** voltage is the current voltage level of the solar panel. It may be tested for proper operation by covering and uncovering the solar panel while ambient light is available. The voltage levels should change from a high value (uncovered) to a low value (covered). The battery voltages – ***Main*** and ***Backup*** – are shown separately. Please note that the ***Backup*** battery on the display screen as well as the below chart is the non-rechargeable battery which is plugged directly into the side of the M5. This battery has the expectancy life of approximately five years if the meter is in optimal conditions. The ***Main*** battery is the rechargeable cell and is directly on the Main PCB of the meter. The values for these voltages are shown in the following table:

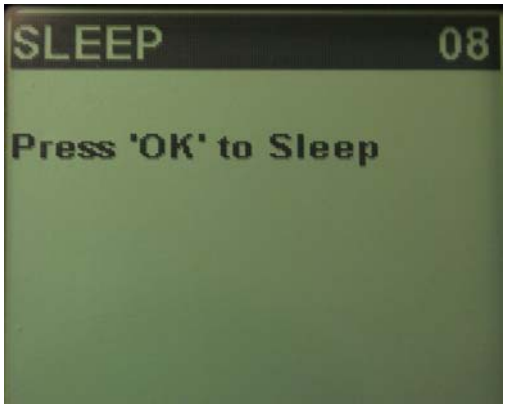
	Maximum	Minimum	Nominal
Solar Panel	5500 mV	1000 mV*	4100 mV
Main Battery	4100 mV	2800 mV	3600 mV
Backup Battery	3680 mV	2800 mV	3600 mV

* Minimum Solar Panel Voltage under indoor lighting

Sleep

The Sleep function allows the meter to be turned off when it is not in use, thus conserving battery power. IPS recommends that the meter be turned off when stored or if the meter is bagged for over 48 hours. If the meter is going to be stored for longer than a month, then please remove the power jumper.

In order to put the meter to sleep, press OK and then press – to confirm. This can also be accomplished by holding down the diagnostic button until a beep is heard and the meter shuts off.



ACCESS CARDS

There are three access cards issued by IPS: Diagnostic Card, Maintenance Card, and Coin Collection card. The cards have a unique number so as to be able to track the user and also block the card from being used if it has been lost or stolen. The cards act like regular credit cards, having a 16 digit number, expiration date, and card holder name.

Meter Diagnostics Card

This card is used to access the meter's Diagnostic Mode. It is convenient to use this card when the meter is inside the housing so that removal of the dome is not necessary. IPS recommends using the Diagnostic Card to access Diagnostic Mode so that the maintenance activity is linked to a specific user, something that can't be accomplished if Diagnostic Mode is entered by pressing the diagnostic button below the keypad.

Maintenance (Meter Credit) Card

The maintenance card is used to add time to the meter. This is a quicker way to give motorists credit than feeding coins through the meter and also allows for greater accountability, as the transactions are logged in the management system. The card is used in a similar fashion as a standard credit card.

Coin Collection Card

When collecting coins from the meter, IPS recommends using the Coin Collection card in order to provide accurate reporting of the money collected and the current value of the cashbox. Upon inserting the card into the meter during coin collection, the screen will display a confirmation message that the collection has been completed. When the card is used, the coin totals and value are reset to zero, and the collected coin information is transmitted to the management system.

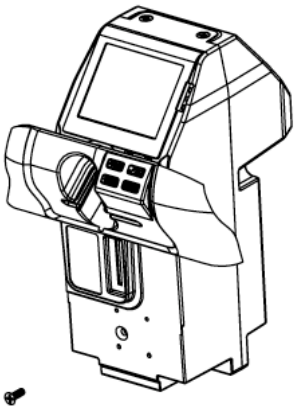
HOW TO …

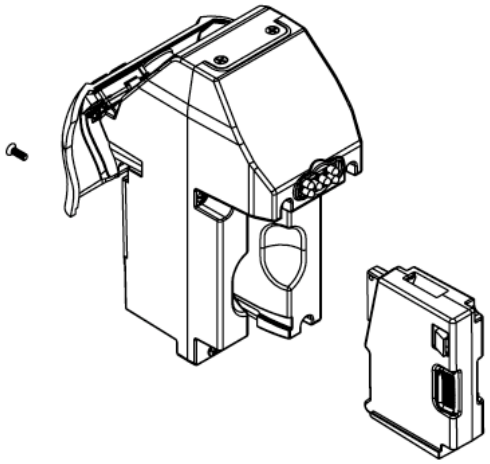
In this section, we will discuss several procedures to include: clear a coin jam, clear a card jam, replace the battery, replace the keypad, and replace the coin slot.

Clear a Coin Jam

When a coin jam occurs, the meter maintenance staff will be notified via email or text message. These jams typically occur due to the insertion of foreign material or insertion of multiple coins all at once, both with the intention of jamming the meter. Otherwise, the design of the meter is such that coin jams will happen very infrequently. If a coin blockage does occur:

1. Remove the screw from the front of the meter
2. Pull the validator from the rear of the meter housing by pressing on the spring loaded retention clip
3. The jam will be visible due to the design of the clear validator cover. Any thin object (such as a screwdriver) can be used to remove the jam. In rare cases, complete disassembly of the validator can be accomplished by removing the screws at the corners of the validator assembly
4. With the jam cleared, insert the validator into its original position, clipping into place
5. Replace the front validator screw





Clear a Card Jam

Thanks to a new design feature, any coins jammed into the card reader slot are automatically cleared with the insertion of a credit card. The coins will fall through an opening in the card reader, thereby clearing the card path. Coins that fall into the meter mechanism housing may be removed at a later time.

In rare cases where coins are maliciously jammed or for the removal of foreign material in the card reader, any thin sturdy device, such as a letter opener can be used to clear foreign objects.

It may also be useful to remove the card reader entry slot to clear the jam. To do this, remove the two screws on the rear of the meter as indicated in the image below:

Replace the Battery

Battery replacement is likely required approximately every two years, depending on operating conditions. There is an additional cable required to connect the battery, which is a three socket to a six pin battery adapter cable.

Method 1 (No tools required)

If your meter is equipped with a battery compartment cover, follow the steps below:

1. Remove the battery compartment cover
2. Disconnect and remove the old battery from the battery extension cable or the main board connector terminal if extension cable is not present
3. Install and plug in the replacement battery

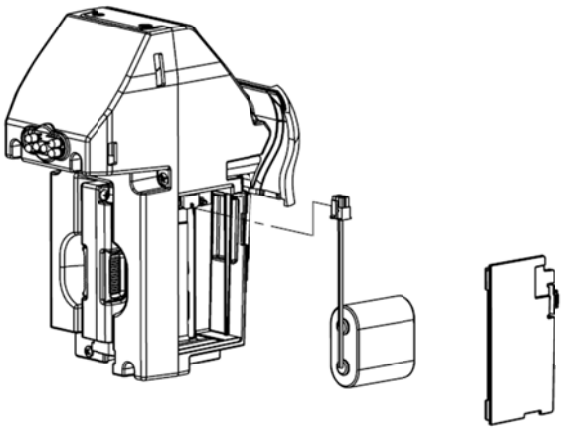
Method 2 (requires a Phillips-head screwdriver):

1. Unscrew and remove the coin validator
2. Remove the screws at the rear of the meter
3. Disconnect and remove the faulty battery from the main board connector terminal
4. Install and plug in the replacement battery
5. Insert and tighten all screws and re-insert the coin validator

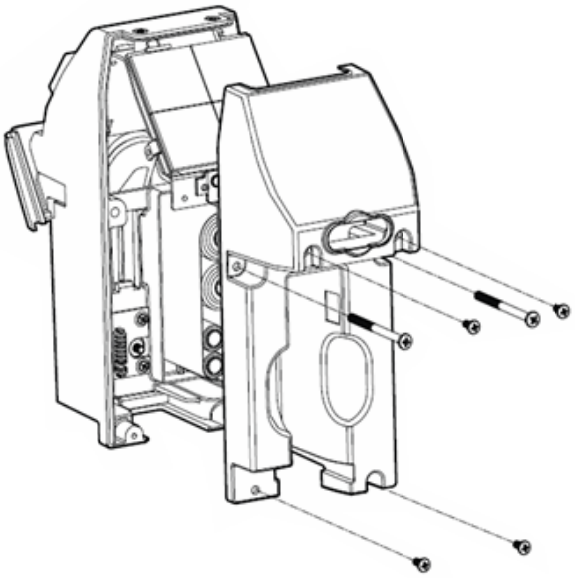
Please see the diagram on the following page.

Replace the Battery

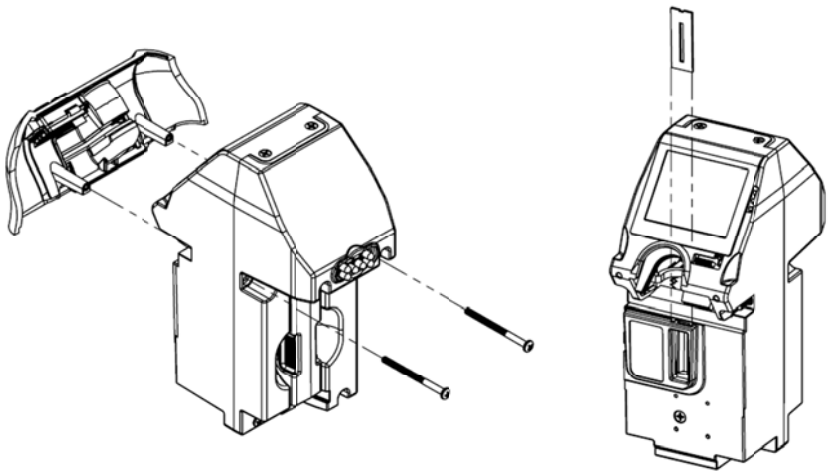
Method 1



Method 2



Replace the Coin Slot



The coin entry slot can easily be changed in order to accept coins of different sizes. To replace the coin slot, remove the Card Entry Slot (as shown below) and the Coin Validator. The coin slot should easily slide out. Insert the new coin slot with the notch-side up, replace the coin validator, and the card entry slot to complete the installation.

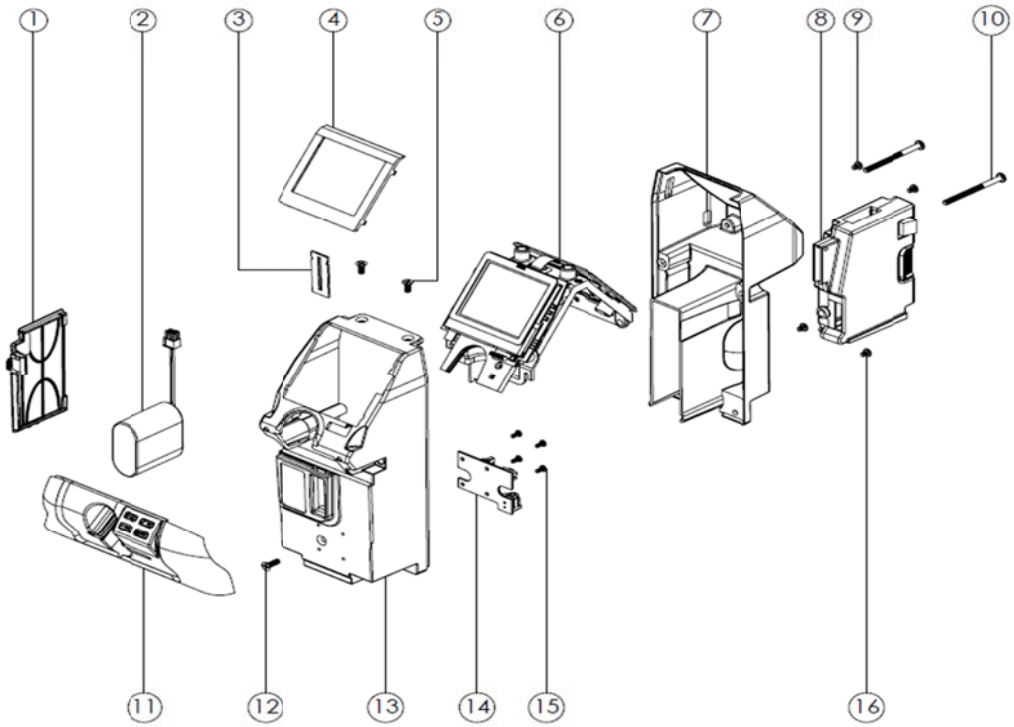
Force a Meter Update

In order to force a meter to call in to the management system to get a firmware update, configuration update, or simply to test communications:

1. Enter Diagnostic mode by pressing the diagnostic switch located below the **OK** button of the keypad or using the Diagnostic Card
2. Scroll through the menus to ***Comms Test*** and press **OK**
3. The meter will attempt to communicate with the server. Do not press any buttons on the keypad during this process as this may interrupt the communication session. See Comms Test for an example of a typical session.
4. Once the meter communication session completes, press **CANCEL** until the meter returns to operating mode

INDEX

A. Parts of the Meter



Meter Mechanism (MK5 Meter Mechanism with NFC)

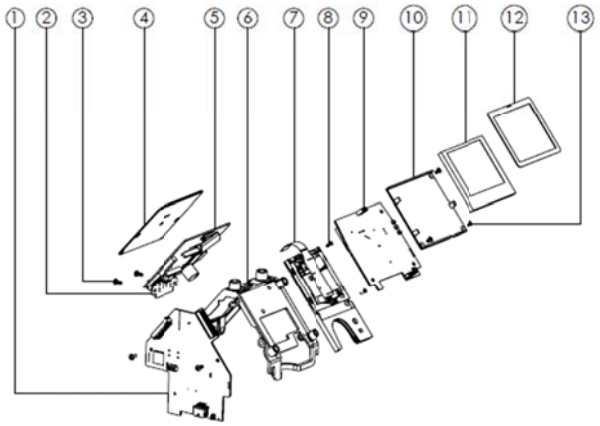
Part Descriptions
1. Battery Cover
2. Battery
3. Coin Entry Slot Plate
4. NFC Bezel
5. UNC 8-32 x 3/8" C'Sunk Phillips Screw (2)
6. Chassis and PCB Assembly with NFC Antenna
7. Module Case Rear
8. Validator with Anti-Fishing
9. UNC 6-32 x 3/16" Pan Phillips Screw (2)
10. UNC 8-32 x 2" Pan Phillips Screw (2)
11. Card Reader Entry Face Plate / Keypad
12. UNC 8-32 x 1/2" C'Sunk Phillips Screw
13. Module Case Front
14. Validator Connector PCB
15. UNC 4-40 x 1/4" Pan Phillips Screw (4)
16. UNC 6-32 x 5/16" Pan Phillips Screw (2)

Circuit Boards / Internal Electronics

The IPS meter uses printed circuit boards and electronic sub-assemblies to process data from inserted cards and coins to communicate a variety of information to the motorists, parking operations staff, as well as the IPS management system.

The function of these boards is as follows:

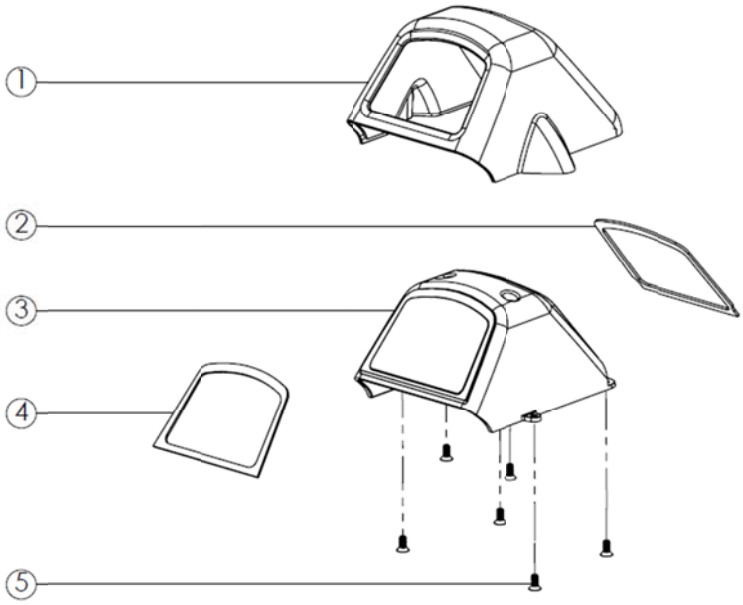
1. Rear expiry LEDs – for enforcement
2. Solar assembly – primarily charges battery pack and drives rear-facing expiry LEDs
3. PCBA chassis – holds all boards in place
4. Card reader sub-assembly – houses the card reader for both magnetic strip and smart card applications
6. Display board – incorporates the LCD and front facing expiry indicator
7. Main board – houses core processing and memory functions. The circuit boards are conformally coated to prevent fault due to exposure to moisture and dust. Depending on the level of user knowledge and training, these boards can be replaced as needed by the customer, or returned to IPS for repair/replacement.



MK5 Circuit Boards / Internal Electronics

Part Descriptions
1. Main PCB
2. Expiry Indicator
3. UNC 4-40 x 1/4" Pan Phillips Screw (5)
4. Solar Panel
5. Solar PCB
6. Chassis Frame and Plate
7. Card Reader
8. UNC 2-56 x 1/4" C'Sunk Phillips Screw (4)
9. Display PCB
10. LCD Spacer
11. LCD
12. NFC Antenna
13. UNC 4-40 x 1/4" C'Sunk u/c Phillips Screw (3)

Top Cover (Model 795)

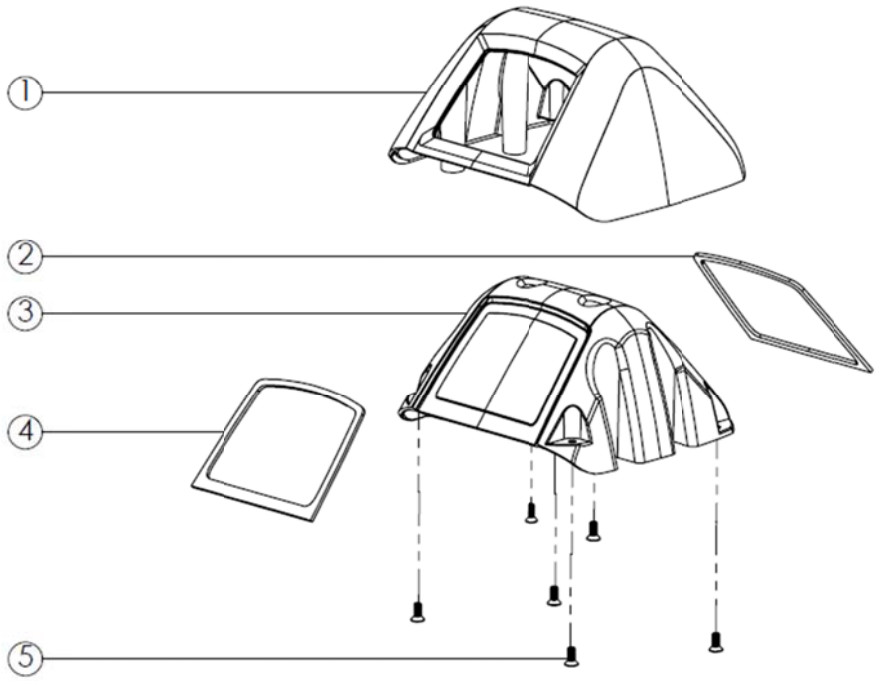


MK5 Top Cover (Model 795)

Part Descriptions
1. Head Upper Casting
2. Solar Gasket
3. Head Lens
4. Interface Gasket
5. UNC 8-32 x 3/8" C'Sunk Phillips Screw

Top Cover (Model 147/Model 132)

Parts and assembly are the same for both 147 & 132 models.



MK5 Top Cover (Model 147/Model 132)

Part Descriptions
1. Head Upper Casting
2. Solar Gasket
3. Head Lens
4. Interface Gasket
5. UNC 8-32 x 3/8" C'Sunk Phillips Screw (6)

B. Error Status Codes

The following error codes may be displayed in the **FAULTS** menu when the meter is placed in Diagnostic Mode:

Battery Low – appears when the meter's battery drops below 3000 mV
Card Stuck – indicates an object inserted into the card reader
Coin Path Blocked – indicates an object obstructing the path of the coin or the validator not being present
OSC Fault – appears when a coin is detected but is not validated
Time or Config error – the time on the meter is off by a more than 24 hours or the configuration on the meter is incorrect

The following error codes may be displayed during a communication session in the **COMMS TEST** menu when the meter is placed in Diagnostic Mode:

GSM Not Found – meter cannot communicate with the GSM radio
CME ERROR 10 – SIM not inserted
CME ERROR 107 – GPRS service not allowed
CME ERROR 553 – context already activated
CME ERROR 555 – activation failed
CME ERROR 557 – cannot setup socket
CME ERROR 559 – time out in opening socket

C. Troubleshooting

Power

Problem: The meter's display is blank and the LEDs are not flashing.
Solution: Be sure to turn the meter on. This can be done by inserting any card into the meter. Insert it completely up the card slot and wait for a beep. If this fails, be sure the battery is plugged in. Also, verify that the card reader connector is attached to the solar panel and that the solar panel is fully connected to the main board.

Problem: The meter's display is blank but the LEDs are on continuously.
Solution: Replace the battery.

Problem: In the Voltage Menu item of the Diagnostic Menu, the Solar Panel voltage is reported as being extremely low (i.e. under 500 mV).
Solution: Verify that the Solar Panel is properly connected to the Main board and there is nothing obstructing the Solar Panel.

Problem: The display is blank, but the lights are flashing.
Solution: Press the diagnostics button. If text appears on the screen, press Cancel. If the screen is still blank, inspect the LCD ribbon cable for damage. Verify that the Display Board is fully connected to the Main board.

Coin Issues

Problem: The meter reads Cards Only/No Coins. In Diagnostic Mode, the meter shows "Coin Path Blocked".
Solution: Check the validator for any obstructions. If the problem persists, check that the validator is properly plugged in and that the connector cable is not loose. Also check that the validator connector board is intact.

Problem: The meter reads Cards Only/No Coins. In Diagnostic Mode, the meter shows "OSC Fault".

Solution: Check the validator for any obstructions. Try swapping the validator with another one as one of the coils of the existing validator may be damaged.

Communication Issues

Problem: During communications, the meter displays "GSM NOT FOUND".
Solution: Make sure that the Solar Panel Board is properly attached to the Main Board.

Problem: During communications, the meter displays "NO SIM".
Solution: Verify that the SIM card is fully inserted into the SIM. Remove and replace the SIM card and force the meter to contact the management system.

Problem: During communications, the meter displays “CSQ 99,99” or “CSQ 0,0” and never displays “Connected”.
Solution: The antenna is not properly attached or the antenna cable is broken. Contact IPS about replacing the antenna. The meter may also be in a location with poor signal strength.

Problem: During communications, the meter displays “CME ERROR: XXX”.
Solution: This is typically the result of a network issue. Contact IPS to verify that the system is operational.

Problem: The meter has the wrong configuration.
Solution: When using an RFID tag, be sure that upon entering Diagnostic Mode the meter has a value for RFID. If all zeros are displayed, check the connection of the cable from the RFID Tag Reader board to the Main Board. You can also use another meter to read the tag. If the new meter shows a value for the RFID number, then the fault is with the meter. In case both meters fail to read the tag, try another tag. Verify that the meter is properly assigned in the management system. Be sure communications are working by going through the Comms Test in the Diagnostic Menu.

D. Cleaning and General Maintenance

For general cleaning purposes, IPS recommends the following procedures. Based on environmental and use conditions, the frequency of these maintenance techniques should be judged by the local maintenance staff and be increased or decreased appropriately.

- Meters surfaces should be kept clean with mild soap and water
- Compressed air may be used to keep the card reader and coin acceptor clear of debris
- The card reader heads should be cleaned with a cleaning card every 1-2 months to ensure optimum performance of the card reader. Cleaning cards may be purchased from IPS

The coin validator should be visually inspected for any damage or debris every 6 months.