IDCUBE

Mercury

ICM-MP2500

Mercury Controller

Installation and specifications

1. Overview

1.1 MP2500 intelligent controller

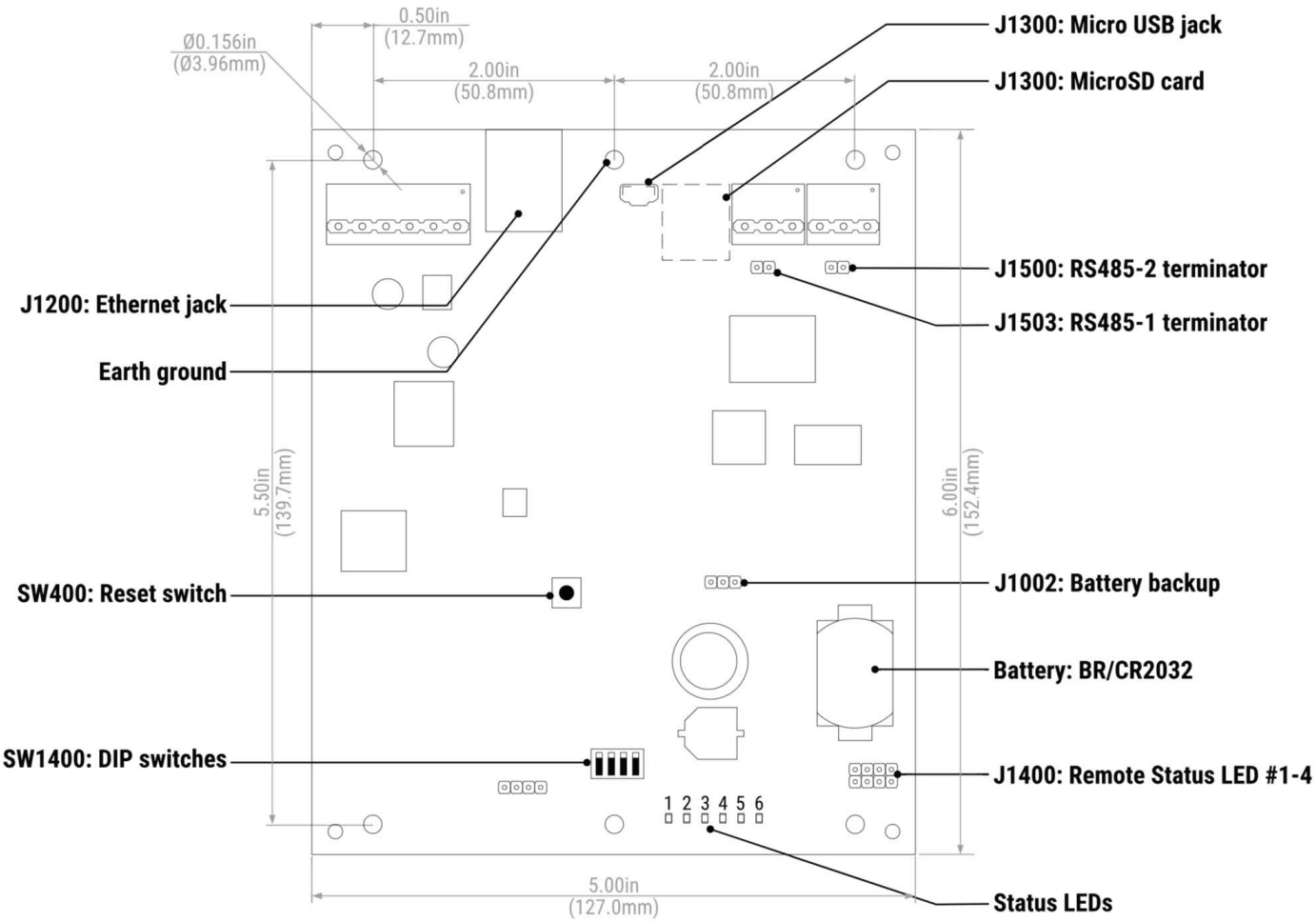
The MP2500 intelligent controller provides decision-making, event reporting, and database storage for the HID® Mercury™ hardware platform.

Host communication is via the on-board 10-BaseT/100Base-TX Ethernet port, or the Micro USB port (2.0) with an optional Micro USB to Ethernet adapter.

Sub controllers are connected via ports 1 and 2 using 2-wire RS-485 multi-drop communication busses.

The MP2500 requires 12 to 24 V DC for power.

1.2 MP2500 hardware



1.3 MP2500 connections

TB300-1	GND	Power fault input
TB300-2	FLT	

TB300-3	GND	Cabinet tamper input
TB300-4	TMP	
TB300-5	GND	Power input
TB300-6	VIN: 12 to 24 V DC	

TB1501-1	GND	SIO Port 1 (2-wire RS-485)
TB1501-2	TR- (B)[1]	
TB1501-3	TR+ (A)[1]	

TB1500-1	GND	SIO Port 2 (2-wire RS-485)
TB1500-2	TR- (B)[1]	
TB1500-3	TR+ (A)[1]	

1. Terms (A) and (B) are from the RS-485 standard.

1.4 Jumpers and jacks

The MP2500 controller hardware interface is configured using jumpers to setup the port interface and end of line termination.

Jumpers	Set at	Description
J1200	N/A	10-BaseT/100Base-TXEthernet port
J1503	OFF	Port 1 RS-485 EOL Terminator is OFF
	ON	Port 1 RS-485 EOL Terminator is ON
J1500	OFF	Port 2 RS-485 EOL Terminator is OFF
	ON	Port 2 RS-485 EOL Terminator is ON
J1100	N/A	microSD card
J1300	N/A	USB port (2.0)
J1400-1	N/A	Remote Status LED #1.[1]
J1400-2	N/A	Remote Status LED #2.[1]
J1400-3	N/A	Remote Status LED #3.[1]
J1400-4	N/A	Remote Status LED #4.[1]
J1002	**Super capacitor or battery backup real time clock.**	
	OFF	Backup battery is OFF
	ON	Backup battery is ON. Default J1002 link 1 and 2 super capacitor real time clock back up. Link 2 and 3 battery back up. See **1.10 Memory and real time clock backup battery**

1. Observe polarity connection to LED. External current limiting is not required.

1.5 DIP switches

The four switches on the SW1400 DIP switch are used to configure the operating mode of the MP2500 controller. DIP switches are read on power-up except where noted. Pressing reset switch SW400 causes the MP2500 to reboot.

1	2	3	4	Definitions
OFF	OFF	OFF	OFF	Normal operating mode.
ON	X	OFF	OFF	After initialization, enable default User Name (admin) and Password (password). The switch is read on the fly, a reboot is not required. See **1.12 IT security** for additional information.
OFF	ON	OFF	OFF	Use factory default communication parameters.
ON	ON	OFF	OFF	Use OEM default communication parameters. Contact system manufacture for details. See **1.7 Bulk erase configuration memory** .
ON	ON	OFF	OFF	Bulk erase prompt mode at power up. See **1.7 Bulk erase configuration memory**.
X	X	X	ON	Makes the MP2500 report and function like an LP2500. To be used in situations where the host software has not been updated to support the MP series product line.

Note:

- All other switch settings are unassigned and reserved for future use.
- X = It doesn't matter if the switch is on or off.

Caution: In the factory or OEM default modes, downloaded configuration/database is not saved to flash memory.

1.6 Factory default communication parameters

Interface 1 (NIC1)

Network: static IP address	192.168.0.251
Subnet mask	255.255.0.0
Default gateway	192.168.0.1
DNS server	192.168.0.1
Primary host port	IP server, Data security: TLS if Available, port 3001, communication address: 0
Alternate host port	Disabled

1.7 Bulk erase configuration memory

The bulk erase function can be used for the following:

- Erase all configuration and cardholder database (sanitize board, less third party applications).
- Update OEM default parameters after OEM code has been changed.
- Recover from database corruption causing the MP2500 board to continuously reboot.

> **Note:** If clearing the memory does not correct the initialization problem, contact Tech Support (support@idcubesystems.com).

1.7.1 Bulk erase steps

1. Set S1400 DIP switches 1 and 2 to **ON**, and 3 and 4 to **OFF**.
2. Apply power to the MP2500 board. LED 1 will flash during panel boot up.
3. After bootup is complete, LEDs 1 and 2, and LEDs 3 and 4 start flashing back and forth alternately at a rate of 0.5 seconds. Within 10 seconds of this beginning, change DIP switch 1 to **OFF**.
4. When complete, only LEDs 1 and 4 will flash for about three seconds.
5. The MP2500 board will restart the boot process and be available at the default IP address of 192.168.0.251.

> **Caution:** Do not remove power during the bulk erase process.

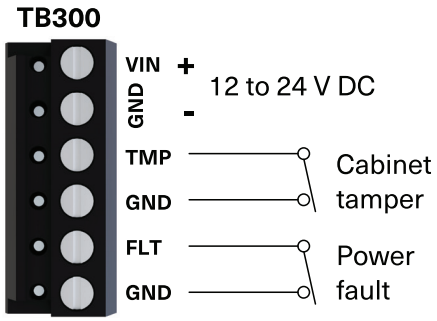
1.8 Input power, cabinet tamper, and UPS fault input wiring

The MP2500 requires 12 to 24 V DC power. Locate power source as close to the unit as possible.

Connect power with minimum of 18 AWG wire. Connect the GND signal to earth ground in ONE LOCATION within the system! Multiple earth ground connections may cause ground loop problems and is not advised.

Observe POLARITY on 12 to 24 V DC input!

There are two dedicated inputs for cabinet tamper and UPS fault monitoring. Normal (safe) condition is a closed contact. If these inputs are not used, install a jumper wire.

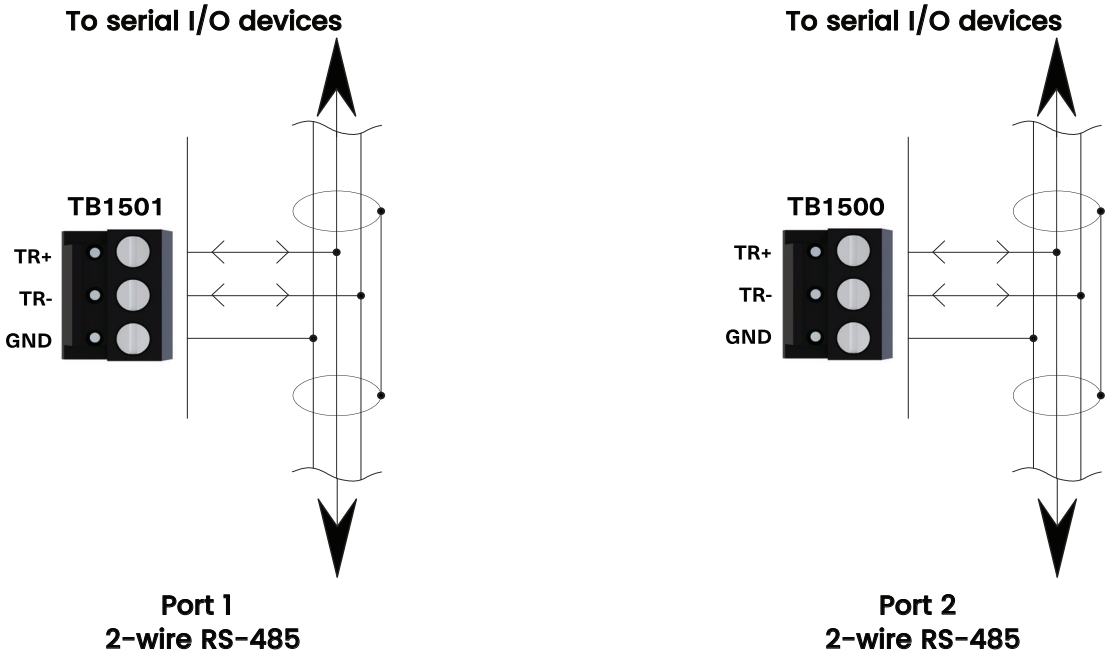


1.9 Communication wiring

The MP2500 controller communicates with the host via: on-board Ethernet 10-BaseT/100Base-TXport and/or the USB port (2.0) with an optional Micro USB to Ethernet adapter.

Ports 1 and 2 use a 2-wire RS-485 interface. The interface allows multi-drop communication on a single bus of up to 4,000 feet (1,219 m). Use 1-twisted pair, shielded, 120Ω impedance, 24 AWG. 4,000 feet. (1,219 m) maximum cable length.

Caution: 120Ω end-of-line termination should be added **ONLY** at each end of the RS-485 bus. If the MP2500 is at one end of the RS-485 bus, jumper J1503 (Port 1) or J1500 (Port 2) can be installed for termination.



Port 1
2-wire RS-485

Port 2
2-wire RS-485

1.10 Memory and real time clock backup battery

The real time clock is backed up by a super capacitor or optional lithium battery when power is interrupted. All other data is stored in non-volatile flash memory.

Note: If using the optional lithium battery, this should be replaced annually.

Super capacitor is selected by default J1002 jumper link 1 and 2. To change to battery back up change jumper link to 2 and 3 and fit lithium coin cell.

Battery type: BR2330 or CR2330.

Note: Data is stored in flash memory to prevent loss of data in the case of power interruption.

1.11 Status LEDs

1.11.1 Power-up

- 1.x firmware - All LEDs are OFF.
- 2.x firmware - NIC LED blinks and all other LEDs are off for eight seconds.

1.11.2 Initialization

- 1.x firmware - After power is applied or reset switch pushed, LED 1 is ON for about 15 seconds, then LEDs 2 through 6 are flashed once at the beginning of initialization. LEDs 3 and 4 are turned ON for approximately 1 second after the hardware initialization has completed, then the application code is initialized.
- 2.x firmware - After power is applied, LED 1 blinks for 50 seconds and LED 4 turns on for 15 seconds indicating a successful boot. LED 1 continues to blink.

The amount of time the application takes to initialize depends on the size of the database, about 1 second without a card database. Each 10,000 cards will add about 2 seconds to the application initialization. When LEDs 1 through 4 flash at the same time, data is being read from or written to flash memory, do not cycle power when in this state. If the sequence stops or repeats, perform the bulk erase procedure, see **1.1 Bulk erase configuration memory**.

1.11.3 Running

LED	Description
1	Off-line / On-line and battery status
	Off-line = 20% ON, On-line = 80% ON
	Double flash if battery is low
2	Host communication activity (Ethernet)
3	Port 1 communication activity
4	Port 2 communication activity
5	Unassigned
6	Unassigned
D1200	Ethernet activity (Ethernet Port 0)
YEL	On-board Ethernet speed: OFF = 10Mb/S, ON = 100Mb/S (Yellow LED)
GRN	OFF = No link, ON = Good link (Green LED), Flashing = Ethernet activity

1.12 IT security

Ensure that the MP2500 is installed securely. Create user accounts to the web configuration page using secure passwords.

Ensure all DIP switches are to be in the **OFF** position for the normal operating mode.

The MP2500 is shipped from the factory with a default login account, which is enabled when DIP 1 is moved from **OFF** to **ON** (See **1.5 DIP switches**). The default login user name (admin) and password (password) will be available for five minutes once the DIP switch is toggled. It is therefore important that at least one user account is defined, and the DIP switches are set to **OFF** before the MP2500 is commissioned.

Configuring the MP2500 with an IP address that is accessible from the public is **not** recommended.

The following options are available for enhanced network security:

- Disable SNMP.
- Zeroconf discovery.
- The web configuration module.
- Enable data encryption over the host communication port.

2. Specifications

2.1 MP2500 controller specifications

The interface is for use in low voltage, Class 2 Circuits only.

The installation of this device must comply with all local fire and electrical codes. Units are to be installed in accordance to NFPA 70. UL verified 12 to 24VDC. The unit is to be powered with a UL listed UL 294 approved power supply with a class 2 power limited output.

Primary power	12 to 24 V DC ± 10%, 250 mA maximum (USB port current not included)
Micro USB port	5 V DC, 500 mA maximum (add 270 mA to primary power current) Not Evaluated by UL
Memory and clock backup	Super capacitor or optional 3 Volt Lithium, type BR2330 or CR2330
microSD card	Format: microSD or microSDHC; 2GB to 8GB
Host communication	Ethernet: 10-BaseT/100Base-TXand Micro USB port (2.0) with optional adapter: pluggable model USB2-OTGE100
Serial I/O device	Two each: 2-wire RS-485, 2,400 to 115,200 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and 1 stop bit
Inputs	Two unsupervised dedicated for cabinet tamper and UPS fault monitoring
CABLE REQUIREMENTS	
Power	1 twisted pair, 18 AWG
Ethernet	Cat 5, minimum
RS-485	1 twisted pair, shield, 120Ω impedance, 24 AWG. 4,000 feet. (1,219 m) maximum cable length
ENVIRONMENTAL	
Storage temperature	-55 to +85°C
Operating temperature	0 to +70°C
Humidity	5 to 95% RHNC
MECHANICAL	
Dimensions	5 inches (127 mm) W x 6 inches (152.4 mm) L x 1 inches (25 mm) H
Weight	4.1 oz. (115 gm) nominal

UL294 Performance Levels ULC 60839-11-1 Indoor use

Feature	Level
Standby Power	I
Endurance	IV
Line Security	I
Destructive Attack	I

These specifications are subject to change without notice.

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