

Mercury Installation Manual

This document is a guide to successful integration of Mercury panels with Brivo Onair in two steps: a set of pre-installation procedures and associating the panel with Onair. If you have Mercury panels currently integrated with a legacy access control system, instructions on how to convert a panel can be found in Appendix C.

I	Introduction	Before You Begin 2 Site Assessment and Planning Information 3
II	Pre-Installation Procedures	Hardware Setup and Wiring 6 Panel Setup..... 8
III	Associating the Panel with Onair	Adding a New Control Panel..... 10
IV	Appendices	A: Site Assessment Worksheets Reader Installation Worksheet..... 11 Door Installation Worksheet 12 Input Output Door Installation Worksheet..... 13 B: Reader Evaluation Requests..... 14 C: Converting a Panel to Communicate with Brivo..... 15 D: EP1502 Technical Information 18 E: MR52 Technical Information 21

BEFORE YOU BEGIN...

What are the minimum requirements for a Mercury Panel?

- Ethernet / LAN
- Internet Connectivity to LAN
- Port 443 on firewall open for outbound HTTPS traffic
- Hub set to Ethernet 10Mbps; half duplex or auto-negotiate
- Proxy server allows outbound HTTPS traffic

If using DHCP...

The panel's MAC address is printed on the label that came with the control panel

If using Static IP...

Be prepared with the following:

- Assigned device IP address
- Network Mask (AKA Subnet Mask)
- Broadcast IP
- Gateway IP
- DNS Server IP address

If changing other Network Parameters...

- Ethernet cable is required
- Default IP address (See the Factory Default Communication Parameters section)
- Default username and password (See the Pre-Configuration Steps section)

How many panels will I need?

To determine the number of panels you need, count the number of doors in your facility and divide by 2. This is the total number of Mercury panels (combination of MRC-EP1502 and MRC-MR52) you will need to manage these doors.

Note: For installations where the panels are connected to a legacy access control system, this may involve adding new panels. For more information on adjusting the connections between existing panels and readers, see the Door/Reader Capacity section.

If you need assistance, contact Brivo Customer Care at customercare@brivo.com or 1.866.274.8648

Site Assessment & Other Planning Information

The first step is to evaluate and fully document the current installation.

Characteristics that should be recorded are:

- Doors
- Inputs
- Outputs
- Access Groups
- Access Permissions
- Time Schedules
- Holiday Schedules
- Elevator cab and floor configuration
- Wiegand card data format(s)
- Anti-Passback Settings
- Number of MR52s connected to each EP1502
- Location of all EP1502 panels and MR52 SIOs

Brivo Customer Care maintains documents to assist in the documentation of existing installations. The forms shown in Appendix A can be used to help document the existing installation.

Card Readers

Card readers designed for use with the Wiegand electrical interface protocol standard are generally supported. However, approval by Brivo Customer Care is required to ensure system compatibility and support. No RS-485 readers are currently supported.

Note: Refer to Appendix B to assist with compiling the information needed by Brivo Customer Care for a reader evaluation.

Door/Reader Capacity

When associating with a Brivo Onair account, EP1502 controllers can only accommodate 14 downstream MR52 SIOs at a time. Setups with 15+ MR52s will require additional controllers. Figure 1 below shows the proper method for modifying the wiring for the panel to support this configuration change.

Both the MR52 and the EP1502 have been designed with the same mounting layout, but different cable termination

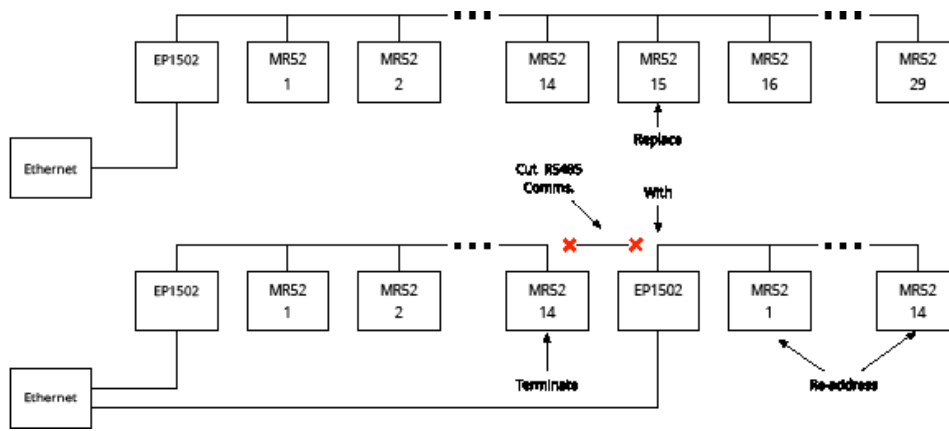


Figure 1 - MR52 Panel Replacement

layouts. When replacing an MR52 panel with an EP1502 controller, the same mounting hardware can be used to mount the EP1502, but modifications to wiring harnesses used with the MR52 are likely. The RS-485 communication cable with the uplink controller must be severed at the new EP1502 location and the previous MR52 panel in the

communication path must have its termination set, as well as the downlink cable severed and preferably removed between the new EP1502 and the previous MR52 as illustrated in Figure 1 (previous page).

Once the new EP1502 controller(s) are wired to the MR52 panels, all downstream panels must be configured with new link addresses starting at Address 1. In addition, a new Internet ready Ethernet cable must also be installed at the new EP1502 controller location.

If more than 4 outputs are being used by the selected MR52, a new EP1502 controller must be inserted as opposed to replacing the MR52. Alternatively, a different MR52 configured with 4 outputs or less up the link must be selected instead. For instance, if MR52 panel 15 is configured to use 5 outputs, and panel 14 is only using 4 outputs, MR52 panel 14 would be a good candidate for an EP1502 replacement. In this circumstance, the severed RS-485 cable will be between MR52 panel 13 and panel 14 (the new EP1502 location).

Systems using the Mercury MUX8, 8-port multi-device interface modules must ensure there are no more than 14 SIO panels connected to any one EP1502 controller. RS-485 networks using MUX8 modules can be complex, therefore care must be taken to ensure a proper configuration of each EP1502 and connected SIOs. Proper insertion or replacement of MR52s with EP1502s is critical to ensure correct configuration.

Input Supervision

While the Mercury EP1502 has the ability to utilize custom resistance values, Brivo Onair currently only accepts dual 1K end of line value, or no supervision at all.

A thorough assessment of all existing input connections should be completed to mitigate any issues that might arise during the transformation from the existing system. The diagram at right illustrates an example of proper wiring on the EP1502 controller for both supervised and unsupervised inputs. Wiring for the MR52 dual reader board follows similarly (Figure 2).

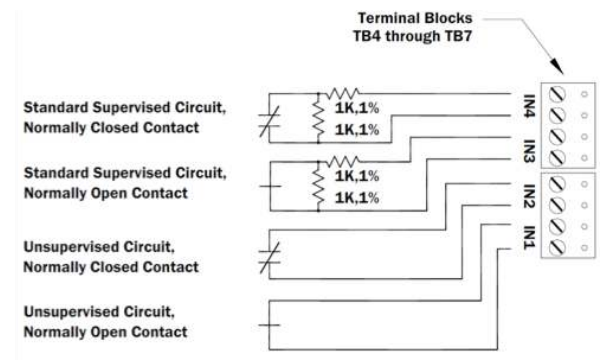


Figure 2 - Input Wiring, Supervised and Unsupervised

Credential Structures

Existing installations using the EP1502 controller require a thorough assessment of all card formats in use, and a mandatory verification of compatibility with existing Onair formats through Brivo Customer Care. While the Mercury EP1502 controller will only support card values up to 64-bits in length, combinations of other card database fields may allow for card structures up to or exceeding 128-bits. Although these constraints will affect new installations with higher security requirements, migrating to the Brivo Onair platform using the same credential criterium may fit within the credential binary ranges compatible with Onair.

Formats currently supported are as follows:

- Wiegand standard 26-bit
- Wiegand 37-bit HID
- Corporate 1000 35-bit and 48-bit

Note: Formats not compatible with Brivo Onair require custom implementation from Brivo Customer Care.

Importing Credential Database

Most systems provide import/export utilities that are typically used for connections to HR or other authoritative or backup sources. Collaboration with Brivo Customer Care will provide the necessary assistance and guidance with credential data transformations.

Elevator Control

The Brivo Onair EP1502 integration supports the capability to control up to 88 floors. Sites with floors greater than 88 will require a second reader in the cab connected to second EP1502 with the appropriate number of MR52s to access another (typically higher) range of floors.

Alarm Panel Interface

Direct communication with an Intrusion Alarm Panel is not supported, although a hardwired interface is possible as illustrated in Figure 3.

Outputs energized on the Mercury hardware cause input activations on the Alarm Panel, providing a level of automation necessary to achieve the desired results. Additionally, output activations on an alarm panel can provide input signals to Brivo Onair allowing for a greater level of automation.

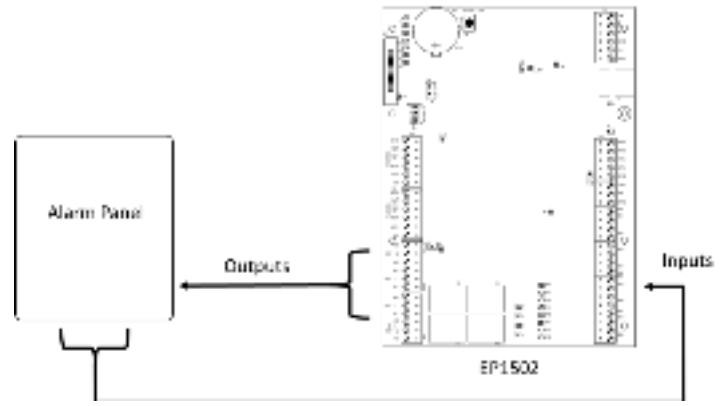


Figure 3 - Alarm Panel Interface

Pre-Installation Procedures

Before you begin installing the Mercury panel, perform the following tasks to ensure a safe, speedy, and successful installation.

Hardware Setup and Wiring

The following section will walk through the hardware setup process. These steps are required prior to getting the Mercury panels associated with an Onair account.

Hardware Setup

Input Power, Cabinet Tamper and UPS Fault Input Wiring (see Figure 4):

- The EP1502 requires 12 to 24 VDC power. Locate power source as close to the unit as possible. Connect power with minimum of 18 AWG wire. Observe POLARITY on 12 to 24 VDC input.
- 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.

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.

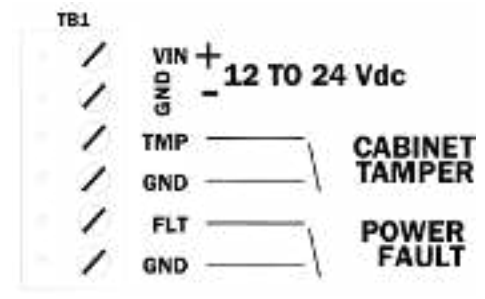


Figure 4

Wiring Recommendations

Wiring recommendations are in the table below. Complete EP1502 wiring information can be found in Appendix D.

Signal	Belden #orEquivalent	AWG	Twisted Pair	Conductor	Shielded?	Max Length
RS-485 Comm, two wire	9841	24	Yes		Yes	4000 ft
Power (22 Gauge)	5504FE	22	Yes		Yes	600 ft
Power (18 Gauge)	6300FE	18	Yes		Yes	1500 ft
R145-Ethernet	N/A	Cat5	Yes		Yes	330 ft
Request-to-Exit	5520FE/6300FE	22/18	Yes		Yes	1500 ft
Door Contact	5500FE	22	Yes		Yes	1500 ft
Reader Option 1 (22 AWG)	5504FE	22		Yes	Yes	250 ft
Reader Option 2 (20 AWG)	5400FE	20		Yes	Yes	300 ft
Reader Option 3 (18 AWG)	6300FE	18		Yes	Yes	500 ft

Communication Wiring

The EP1502 controller communicates to the host via the on-board 10-BaseT/100Base-TX Ethernet interface J2 (port 0). The serial I/O device communication port (TB3) is a 2-wire RS-485 interface (see Figure 5), which can be used to connect additional I/O panels. The interface allows multi-drop communication on a single bus of up to 4,000 feet (1,219 m). Use twisted pairs (minimum 24 AWG) with drain wire and shield for communication.

Note: Install the termination jumper ONLY on the panel at each end of the RS-485 bus. Failure to do so will compromise the proper operation of the communication channel.

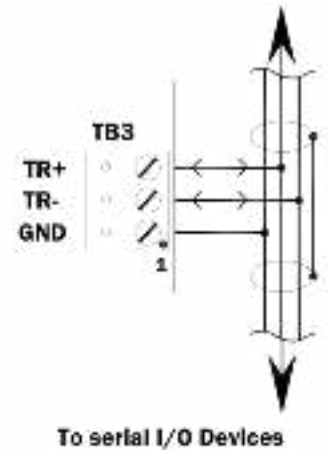


Figure 5 - RS-485 2-Wire Connection Diagram

Reader Wiring

Each reader port supports a reader with Wiegand (D1/D0) or Magnetic Stripe (Clock/Data) TTL signaling. Power to the readers is selectable: 12 VDC (VIN must be greater than 20 VDC), or power is passed-through (PASS) from the input voltage of the EP1502 (TB1-VIN), 180 mA maximum per reader port. Readers that require different voltage or have high current requirements must be powered separately. Refer to the manufacturer's specifications for cabling requirements for your readers. In the 2-wire LED mode the buzzer output is used to drive the second LED. Reader port configuration is set via the host software.

To fully utilize each reader port: TTL signaling requires a shielded 6-conductor cable (18 AWG), see Figure 6 below. If the input voltage to the EP1502 is 12 VDC, jumper J7 MUST be in the PASS position, see Figure 7 below.

12V PASS	READER POWER
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	12 Vdc IS AVAILABLE ON READER PORTS (VIN > 20 Vdc)
<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	VIN POWER IS "PASSED THROUGH" TO READER PORTS

Figure 6

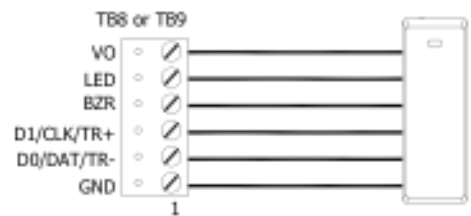


Figure 7

Input Circuit Wiring

Typically, these inputs are used to monitor door position, request to exit, or alarm contacts. Input circuits can be configured as unsupervised or supervised. When unsupervised, reporting consists of only the open or closed states. When configured as supervised, the input circuit will report not only open and closed, but also open circuit, shorted, grounded, and foreign voltage.

A supervised input circuit requires two resistors be added to the circuit to facilitate proper reporting. The standard supervised circuit requires 1k ohm, 1% resistors and should be located as close to the sensor as possible. Custom end of line (EOL) resistances may be configured via the host software. The input circuit wiring configurations shown in Figure 8 are supported but may not be typical.

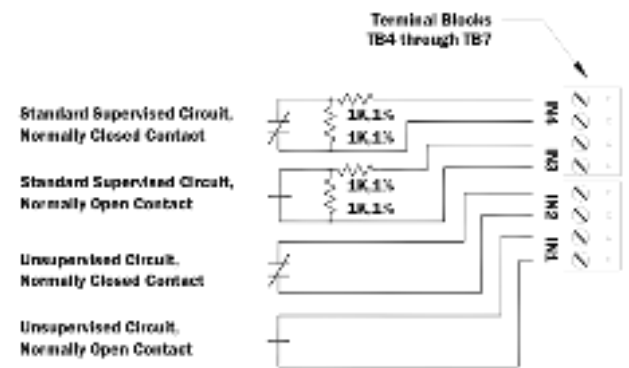


Figure 8 - RS-485 2-Wire Connection Diagram

Relay Circuit Wiring

Four relays with Form-C contacts are provided for controlling door lock mechanisms or alarm signaling. The relay contacts are rated at 5 A @ 30 VDC, dry contact configuration. Each relay has a Common pole (C), a Normally Open pole (NO) and a Normally Closed pole (NC). When you are controlling the delivery of power to the door strike, the Normally Open and Common poles are used. When momentarily removing power to unlock the door, as with a mag lock, the Normally Closed and Common poles are used. Check with local building codes for proper egress door installation.

Door lock mechanisms can generate feedback to the relay circuit that can cause damage and premature failure of the relay. For this reason, it is recommended that a diode be used to protect the relay. Wire should be of sufficient gauge to avoid voltage loss.

Diode Selection (Figure 9)

Diode current rating: 1x strike current

Diode breakdown voltage: 4x strike voltage

For 12 VDC or 24 VDC strike, diode 1N4002 (100V/1A) typical.

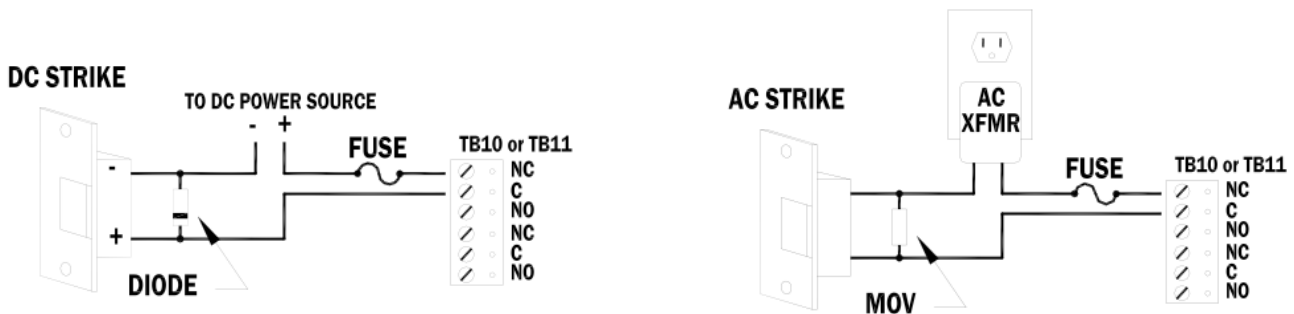


Figure 9

Memory and Real Time Clock Backup Battery

The static RAM and the real time clock are backed up by a lithium battery when input power is removed. This battery should be replaced annually. If data in the static RAM is determined to be corrupt after power up, all data, including flash memory, is considered invalid and is erased. All configuration data must be re-downloaded. Remove the insulator from the battery holder after installation. Battery type: BR2325, BR2330, or CR2330.

Panel Setup

After you have the Mercury hardware set up, it is recommended to factory default the panel before configuration.

Bulk Erase Configuration Memory

The bulk erase function can be used for the following purposes:

- Erase all configuration and cardholder database (sanitize board)
- Update OEM default parameters after OEM code has been changed
- Recover from database corruption causing EP1502 board to continuously reboot

If clearing the memory does not correct the initialization problem, contact Brivo Customer Care.

Bulk Erase Steps

Do not remove power during steps 1-8.

1. Set S1 DIP switches to: 1 & 2 "ON", 3 & 4 "OFF".
2. Apply power to the EP1502 board.
3. Watch for LEDs 1 & 2 and 3 & 4 to alternately flash at a 0.5 second rate.
4. Within 10 seconds of powering up, change switches 1 or 2 to "OFF". If these switches are not changed, the EP1502 board will power up using the OEM default communication parameters.
5. LED 2 will flash indicating that the configuration memory is being erased.
6. Full memory erase takes up to 60 seconds.
7. When complete, only LEDs 1 & 4 will flash for 8 seconds.
8. The EP1502 board will reboot 8 seconds after LEDs 1 & 4 stop flashing (no LEDs are on during this time).

Factory Default Communication Parameters

After you have factory defaulted the panel, the following is the default network parameters.

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, no encryption, port 3001, communication address: 0

Alternate Host Port 1: RS-232, 38,400 baud, no encryption, no flow control.

Pre-Configuration Steps

Once you have reached the panel...

1. Set DIP switch 1 to ON and login into the panel using the default username and password. You will have 5 minutes after setting DIP switch 1 on to login.
Username: [admin](#)
Password: [password](#)
2. Once logged in, it is recommended to add a new user. In order to maintain a high degree of security, the default account and password MUST be changed. Click on the user tab, add a new user and password, then click save.
3. Set the panel to desired network parameters either DHCP or a specific Static IP under the network tab.
4. Go to device info and write down MAC address and FW revision. This information will be needed shortly.
5. Go to apply settings and the panel will reboot.
6. Connect a properly terminated Ethernet cable (Category 5 or higher) to the EP1502 Ethernet port, with the other end connected to a network switch that has connectivity to the Internet.

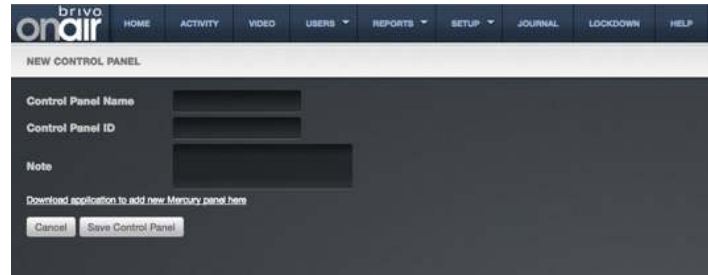
What if I have existing panels?

if you have an existing panel, see Appendix C for steps that must be executed prior to associating the panel with Onair.

Associating the Panel with Onair

Adding a New Control Panel

1. Login to your Onair account.
2. Navigate to the Setup tab and down to Setup → Sites/Doors → New Control Panel

The screenshot shows the 'NEW CONTROL PANEL' form in the Brivo Onair web interface. The form has a dark background and includes the following fields: 'Control Panel Name' with a text input field, 'Control Panel ID' with a text input field, and 'Note' with a larger text area. Below these fields is a link that says 'Download application to add new Mercury panel here'. At the bottom of the form are two buttons: 'Cancel' and 'Save Control Panel'.

3. Type in the desired name for the control panel
4. Insert the Control Panel ID. This will be the panel's MAC address with the prefix "SCP-." (Ex. SCP-1234567890)
5. Input any notes and then click Save Control Panel

The panel has now been associated to the Onair account. Ensure that the panel is now communicating and continue with configuring your Onair account. For additional notes on Onair configuration, please read the *Brivo Onair Administrator's Manual*.

Appendix A: Site Assessment Worksheets

Reader Installation Worksheet

COMPANY NAME	MASTER ADMIN.	DATE
SITE NAME	TECHNICIAN	DEALER REF. #

PANEL DESCRIPTION	KEYPAD	RS-485?	WIEGAND?	LED	BUZZ	NOTES
ex. North Entrance	KP123	Yes <input type="radio"/> No <input checked="" type="radio"/>	<input checked="" type="radio"/> Yes No <input type="radio"/>	<input checked="" type="radio"/> 2-Wire <input type="radio"/> 1-Wire	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
2				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
3				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
4				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
5				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
6				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
7				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
8				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
9				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
10				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
11				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
12				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
13				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
14				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
15				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
16				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
17				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
18				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
19				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
20				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
21				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
22				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
23				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
24				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
25				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
26				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
27				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
28				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
29				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	
30				2-Wire <input type="radio"/> 1-Wire <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>	

Door Installation Worksheet

COMPANY NAME	MASTER ADMIN.	DATE
SITE NAME	TECHNICIAN	DEALER REF. #

DOOR NAME	CONTROL PANEL ID #	BOARD #	DOOR NODE (1-2)	READER TYPE*	HAS REX**	DOOR AJAR THRESHOLD (30-600 SECS.)	INVALID PINS THRESHOLD (1-10 PINS, 10-600 SECS.)	PASS THROUGH PERIOD (1-600 SECS)	ALARM SHUNT DELAY (1-240 SECS)
ex. Lobby Door	CP123456	8	1	CKDB	Yes <input checked="" type="radio"/> No <input type="radio"/>	<input checked="" type="checkbox"/> 123	3 / 120	10	1
1				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
2				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
3				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
4				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
5				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
6				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
7				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
8				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
9				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
10				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
11				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
12				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
13				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
14				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
15				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
16				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
17				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
18				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
19				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		
20				CKDB	Yes <input type="radio"/> No <input type="radio"/>	<input type="checkbox"/>	/		

* Reader Types: C - Card Reader; K - Keypad; D - Dual Reader (Card Reader & Keypad); B - Biometric ** REX - Request-to-Exit Switch / Sensor

CARDS		
<input type="checkbox"/> Standard 26-Bit	<input type="checkbox"/> Generic 34-Bit (Odd Parity)	<input type="checkbox"/> Allegion 34-Bit Wiegand
<input type="checkbox"/> HID Corporate 1000	<input type="checkbox"/> Casi Rusco 40-Bit	<input type="checkbox"/> FASC-N
<input type="checkbox"/> HID Corporate 1000 48-Bit	<input type="checkbox"/> 128-Bit PIV	<input type="checkbox"/> HID 33-Bit
<input type="checkbox"/> HID 37-Bit	<input type="checkbox"/> 64-Bit BCD PIV for pivCLASS	<input type="checkbox"/> HID 33 D10202-Bit
<input type="checkbox"/> HID 37-Bit with Facility Code	<input type="checkbox"/> 64-Bit Reverse RCD PIV for pivCLASS	
<input type="checkbox"/> Generic 34-Bit (Even Parity)	<input type="checkbox"/> 75-Bit PIV	

FACILITY CODE	COMPANY ID CODE	
---------------	-----------------	--

Input/Output Board Installation Worksheet

COMPANY NAME	MASTER ADMIN.	DATE
SITE NAME	TECHNICIAN	DEALER REF. #

DEVICE NAME	CONTROL PANEL ID #	BOARD # (2-16)	IO TYPE*	INPUT (1-8)	OUTPUT (1-8)	OUTPUT BEHAVIOR **
ex. Motion Sensor Switch	CP123456	8	I NO/NC	6	7	L U F P
1			I NO/NC			L U F P
2			I NO/NC			L U F P
3			I NO/NC			L U F P
4			I NO/NC			L U F P
5			I NO/NC			L U F P
6			I NO/NC			L U F P
7			I NO/NC			L U F P
8			I NO/NC			L U F P
9			I NO/NC			L U F P
10			I NO/NC			L U F P
11			I NO/NC			L U F P
12			I NO/NC			L U F P
13			I NO/NC			L U F P
14			I NO/NC			L U F P
15			I NO/NC			L U F P
16			I NO/NC			L U F P
17			I NO/NC			L U F P
18			I NO/NC			L U F P
19			I NO/NC			L U F P
20			I NO/NC			L U F P
21			I NO/NC			L U F P
22			I NO/NC			L U F P
23			I NO/NC			L U F P
24			I NO/NC			L U F P
25			I NO/NC			L U F P
26			I NO/NC			L U F P
27			I NO/NC			L U F P
28			I NO/NC			L U F P
29			I NO/NC			L U F P
30			I NO/NC			L U F P

* I = Input; NO = Normally Open; NC = Normally Closed ** L = Latch; U = Unlatch; F = Follow; P = Pulse

Appendix B: Reader Evaluation Requests

Brivo will evaluate and qualify a reader for installation with the Mercury EP1502 Panel. All we ask is that you provide us with a reader and the credentials required for operation. Evaluation of a reader may take up to two weeks to complete. Any reader sent to Brivo must be in “like new” condition and free of defects.

Include the following in an email to customercare@brivo.com to get started.

Contact Information

- Your Full Name
- Phone Number (direct to you, if possible)
- Email Address
- Company Name and Full Address

Reader Type

Indicate what type of reader you need to have evaluated (select from the following).

- Prox 125KHz
- SC 13.56MHz
- RF
- Multi-Tech
- Barcode / Magstripe

Note: if your reader type is not included in this list, indicate what type of reader it is to the best of your understanding

Requirements for your Reader

More than one may apply. Indicate whether or not your reader...

- must operate at 500 feet
- will be used in an elevator
- requires power
- must operate with specific credentials

Comments

In your email, include any additional information Brivo Customer Care might need to help with the evaluation.

Appendix C: Converting the Panel to Communicate with Brivo

Mercury controllers are added to the Brivo Onair system using a process which mutually authenticates the hardware to the Brivo account in order to securely register the panel. The process involves downloading a zip file from the Brivo Onair site, which includes a Java application that is used to generate the required X.509 certificates, and properly register the controller into the Brivo system. Once downloaded, the application is extracted and launched from a client computer.

Follow the steps below after completing the Site Assessment and Pre-Installation Procedures described in this document. Once you have completed these steps you will need to associate the panel with Onair as described in the Associating a Panel with Onair section.

Manufacturing Client

1. Log into to the Brivo Onair account using the appropriate credentials previously provided.
2. Navigate to the Setup tab and down to Setup → Sites/Doors → New Control Panel. The Control Panels List page displays.
3. Click on the 'New Control Panel' button; the New Control Panel page will be displayed.



4. Below the Notes field, click on the "Download application to add new Mercury panel here" link.
5. The Mercury manufacturing client zip file will download. You only need to download this file once. It can be used on any Mercury EP1502 control panel.

Name	Date Modified	Size	Kind
lib	Jul 3, 2018 at 3:28 PM	--	Folder
mercury-manufacturing-client.jar	May 25, 2018 at 12:13 PM	65 KB	Java JAR file
readme.txt	May 25, 2018 at 12:13 PM	1 KB	Plain Text

6. Expand the zip file which will display the contents of the mercury-manufacturing-client-1.0.0 folder: a .jar file that contains the information necessary to run the manufacturing client on the local computer and a readme.txt file.

- Open the readme.txt file and follow the instructions within.

```

#####
## How to use the Mercury Manufacturing Client ##
#####

1. Launching the Application

  A. For Windows Users

    a. Make sure you have the latest version of Java installed
    b. Double-click "mercury-manufacturing-client.jar"

  B. For Mac Users

    a. Make sure you have the latest version of Java installed
    b. Double-click "mercury-manufacturing-client.jar"
    c. If that doesn't launch the application, try right-clicking/tow-finger clicking and choosing to
open with "Jar Launcher", then select "Open"
    d. If that doesn't launch the application, open a Terminal, go to the folder containing "mercury-
manufacturing-client.jar" and launch it by typing in
        java -jar mercury-manufacturing-client.jar

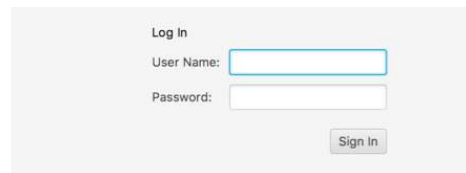
2. Manufacturing a panel

  a. Enter your Brivo credentials
  b. Click "Sign In"
  c. Enter the panel's MAC address and firmware version
  d. Click on "Manufacture Panel", if it succeeds you will find two files on your Desktop named <MAC
address>.crt and <MAC address>.pem
  e. Use those files to install your panel
    
```

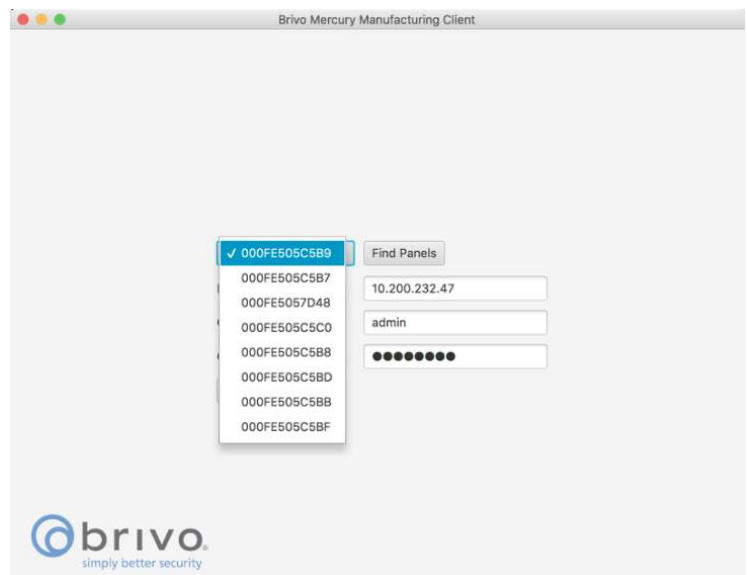
- Once you have clicked on the mercury-manufacturing-client.jar file, the Brivo Mercury Manufacturing Client window appears.

- Enter your Brivo Onair User Name and Password and click Sign In.

Note: Only Master, Super, Senior, and Installer admin accounts will work.



- The manufacturing client will search for panels on your network. Once it has done that, it will display the IP address(es) of the panel(s) found on your network. Select the panel you want to manufacture from the dropdown list and click on the Panel Settings button.



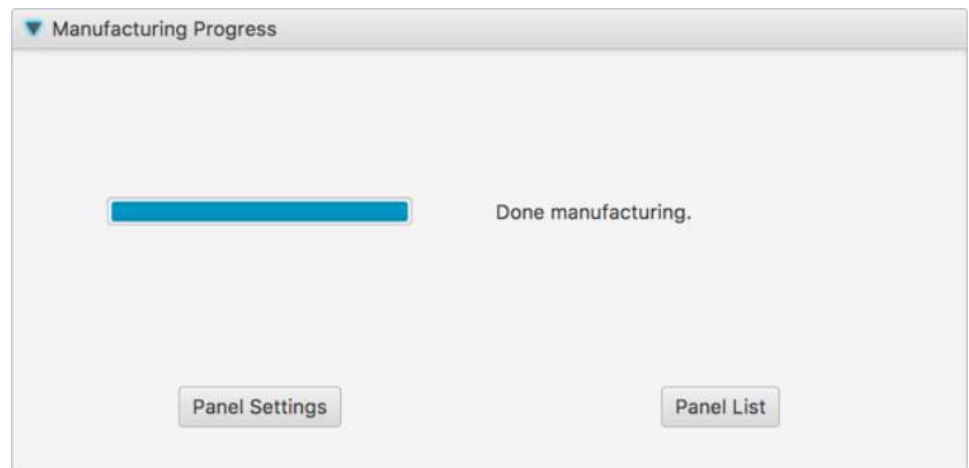
- The Configure Panel page displays where you may view and/or change the Host Name and IP settings of the Mercury Panel.

Note: The Control Panel ID number of the Mercury panels in Brivo Onair is the panel's MAC address with the prefix SCP.

For example, SCP-1234567890.



- Make any changes that are needed and click the Manufacture Panel button which will run the manufacturing client.



- Once the manufacturing process is complete, the Mercury panel can be associated with your Brivo Onair account.

Appendix D: EP1502 Technical Information

EP1502 Board Specifications

Primary Power	12 to 24 VDC \pm 10 %, 500 mA maximum (reader current not included)
Memory and Clock Backup Battery:	3 Volt Lithium, type BR2325, BR2330 or CR2330
Host Communication:	Ethernet: 10-BaseT/100Base-TX, and RS-232: 9,600 to 115,200 bps
Serial I/O Device	2-wire RS-485: 2,400 to 115,200 bps
Inputs:	Eight unsupervised/supervised, standard EOL: 1k/1k ohm, 1%, ¼ watt Two unsupervised dedicated for cabinet tamper and UPS fault monitoring
Outputs:	Four relays: Form-C, 5 A @ 30 VDC, resistive
READER INTERFACE:	
Power: (jumper selectable)	12 VDC \pm 10 % regulated, 180 mA maximum each reader (input voltage (VIN) must be greater than 20 VDC) or 12 to 24 VDC \pm 10 % (input voltage passed through), 180 mA maximum each reader
Data Inputs:	TTL compatible
LED Output:	TTL levels, high>3 V, low<0.5 V, 5 mA source/sink maximum
Buzzer Output:	Open collector, 12 VDC open circuit maximum, 40 mA sink maximum
CABLE REQUIREMENTS:	
Power:	1 twisted pair, 18 AWG
Ethernet:	CAT-5, minimum
RS-485:	1 twisted pair with drain wire and shield, 24 AWG, 4,000 ft. (1,219 m) max.
(I/O Device Port) (Reader Port)	1 twisted pair with drain wire and shield, 24 AWG, 2,000 ft. (610 m) max.
Alarm Input:	1 twisted pair, 30 ohms maximum
MECHANICAL:	
Dimension:	8 in. (203.2 mm) W x 6 in. (152.4 mm) L x 1 in. (25 mm) H
Weight:	9 oz. (255 g) nominal, board only
ENVIRONMENTAL:	
Temperature:	-55 to +85 °C, storage 0 to +70 °C, operating
Humidity:	5 to 95 % RHNC
SECURITY:	
Host Communication Security Profile:	HTTPS/TLS1.2+, with AES256 encryption. Panel to host mutual authentication with X.509 digital certificates

EP1502 Terminal Block Connections

The table below shows the terminal block connections for TB1 through TB11.

		CONNECTION		CONNECTION	
TB1-1	GND	Power Fault	TB8-1	GND: Ground	Reader 1
TB1-2	FLT	Input	TB8-2	DAT/D0: Data/Data 0	
TB1-3	GND	Cabinet	TB8-3	CLK/D1: Clock/Data 1	
TB1-4	TMP	Tamper Input	TB8-4	BZR: Reader Buzzer	
TB1-5	GND	Power Input	TB8-5	LED: Reader LED	
TB1-6	VIN	12 to 24 VDC	TB8-6	VO: Reader Power	
TB2-1	GND	Host Port 1	TB9-1	GND: Ground	Reader 2
TB2-2	CTS	(RS-232)	TB9-2	DAT/D0: Data/Data 0	
TB2-3	RTS		TB9-3	CLK/D1: Clock/Data 1	
TB2-4	RXD		TB9-4	BZR: Reader Buzzer	
TB2-5	TXD		TB9-5	LED: Reader LED	
TB3-1	GND	SIO Port	TB9-6	VO: Reader Power	
TB3-2	TR-	(2-wire RS-485)	TB10-1	NO: Normally Open Contact	Out 1
TB3-3	TR+		TB10-2	C: Common	
TB4-1	IN2-	Input 2	TB10-3	NC: Normally Closed Contact	
TB4-2	IN2+		TB10-4	NO: Normally Open Contact	Out 2
TB4-3	IN1-	Input 1	TB10-5	C: Common	
TB4-4	IN1+		TB10-6	NC: Normally Closed Contact	
TB5-1	IN4-	Input 4	TB11-1	NO: Normally Open Contact	Out 3
TB5-2	IN4+		TB11-2	C: Common	
TB5-3	IN3-	Input 3	TB11-3	NC: Normally Closed Contact	
TB5-4	IN3+		TB11-4	NO: Normally Open Contact	Out 4
TB6-1	IN6-	Input 6	TB11-5	C: Common	
TB6-2	IN6+		TB11-6	NC: Normally Closed Contact	
TB6-3	IN5-	Input 5			
TB6-4	IN5+				
TB7-1	IN8-	Input 8			
TB7-2	IN8+				
TB7-3	IN7-	Input 7			
TB7-4	IN7+				

EP1502 Jumpers

The EP1502 processor hardware interface is configured using jumpers to setup the port interface and end of line termination.

JUMPER	SET AT	DESCRIPTION
J1	N/A	Factory Use Only
J2	N/A	10-Base-T/100Base-Tx Ethernet Connection (Port 0)
J3	N/A	Factory Use Only
J4	N/A	Factory Use Only
J5	OFF	Port 2 RS-485 EOL Terminator is Off
	ON	Port 2 RS-485 EOL Terminator is On
J6	N/A	Factory Use Only
J7		Reader Power Select. See Note 1
12V	Internal 12 VDC at Reader Ports	
PASS	VIN "Pass Through" to Reader Ports	
J8-1	N/A	Remote Status LED #1. See Note 2
J8-2	N/A	Remote Status LED #2. See Note 2
J8-3	N/A	Remote Status LED #3. See Note 2
J8-4	N/A	Remote Status LED #4. See Note 2

Note 1: The input power (VIN) must be 20 VDC minimum if the 12V selection is to be used.

Note 2: Observe polarity connection to LED. External current limiting is not required.

EP1502 DIP Switches

The four switches on S1 DIP switch configure the operating mode of the EP1502 processor. DIP switches are read on power-up except where noted. Pressing switch S2 causes the EP1502 to reboot.

1	2	3	4	DEFINITIONS
OFF	OFF	OFF	OFF	Normal operating mode.
ON	X	X	X	After initialization, enable default User Name (admin) and Password (password). The switch is read on the fly, no need to re-boot. See IT Security section for additional information.
OFF	ON	X	OFF	Use factory default communication parameters.
ON	ON	X	OFF	Use OEM default communication parameters. Contact system manufacture for details. See Bulk Erase below.
X	X	ON	X	Disable TLS secure link. Switch is read only when logging on.
ON	ON	OFF	OFF	Bulk Erase prompt mode at power up.

All other switch settings for unassigned and are reserved for future use. X = don't care.

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

Appendix E: MR52 Technical Information

MR52 Board Specifications

Primary Power	12 to 24 VDC \pm 10 %, 550 mA maximum (reader current not included)
Outputs:	Six relays: Form-C, 5 A @ 30 VDC, resistive
Inputs:	Eight unsupervised/supervised, standard EOL: 1k/1k ohm, 1%, 1/4 watt Two unsupervised, dedicated for cabinet tamper and UPS fault monitoring
READER INTERFACE:	
Power: (jumper selectable)	12 VDC \pm 10 % regulated, 180 mA maximum each reader (input voltage (VIN) must be greater than 20 VDC) or 12 to 24 VDC \pm 10 % (input voltage passed through), 180 mA maximum each reader
Data Inputs:	TTL compatible, F/2F or 2-wire RS-485
LED Output:	TTL compatible, high > 3 V, low < 0.5 V, 5 mA source/sink maximum
Buzzer Output:	Open collector, 12 VDC open circuit maximum, 40 mA sink maximum
Communication	2-wire RS-485: 9600, 19200, 38400 or 115200 bps
CABLE REQUIREMENTS:	
Power:	1 twisted pair, 18 AWG
RS-485 I/O Devices:	1 twisted pair with drain wire and shield, 24 AWG, 120 ohm impedance, 4,000 feet (1,200 m) maximum
Alarm inputs:	One twisted pair per input, 30 ohms maximum
Outputs:	As required for the load
Reader data (TTL):	6-conductor, 18 AWG, 500 feet (150 m) maximum
Reader data (F/2F):	4-conductor, 18 AWG, 500 feet (150 m) maximum
Reader data (RS-485):	1 twisted pair with drain wire and shield, 24 AWG, 120 ohm impedance, 2,000 feet (610 m) maximum
MECHANICAL:	
Dimension:	6 in. (152 mm) W x 8 in. (203 mm) L x 1 in. (25 mm) H
Weight:	11 oz. (312 g) nominal
ENVIRONMENTAL:	
Temperature:	-55 to +85 °C, storage 0 to +70 °C, operating
Humidity:	5 to 95 % RHNC

MR52 Jumpers

JUMPER	DESCRIPTION
J2	Reader Power Select 12V = 12 VDC at reader ports. *** See note below *** PT = VIN "Passed Through" to reader ports
J3	2-Wire/4-Wire Select, install in 2W position only
J5	RS-485 Termination, install in first and last units only
J6	Factory use only
J7	Factory use only
J8	Factory use only
J9	Factory use only
J10	Factory use only
J11	Factory use only
J12	Factory use only
J13	Factory use only
J14	Factory use only
J15	Factory use only

Note: The input power (VIN) must be 20 VDC minimum if the 12 VDC selection is to be used.

MR52 DIP Switch

S8	S7	S6	S5	S4	S3	S2	S1	SELECTION
.	.	.	OFF	OFF	OFF	OFF	OFF	Address 0
.	.	.	OFF	OFF	OFF	OFF	ON	Address 1
.	.	.	OFF	OFF	OFF	ON	OFF	Address 2
.	.	.	OFF	OFF	OFF	ON	ON	Address 3
.	.	.	OFF	OFF	ON	OFF	OFF	Address 4
.	.	.	OFF	OFF	ON	OFF	ON	Address 5
.	.	.	OFF	OFF	ON	ON	OFF	Address 6
.	.	.	OFF	OFF	ON	ON	ON	Address 7
.	.	.	OFF	ON	OFF	OFF	OFF	Address 8

Documentation Disclaimer and Restrictions

Information in this document is subject to change without notice and does not represent a commitment on the part of Brivo Systems LLC. For the most up-to-date information, visit www.brivo.com.

This document and the data herein shall not be duplicated, used or disclosed to others for procurement or manufacturing, except as authorized with the written permission of Brivo Systems LLC. The information contained within this document or within the product itself is considered the exclusive property of Brivo Systems LLC. All information in this document or within the hardware and software product themselves is protected by the copyright and/or other intellectual property laws of the United States.

Revision List

Date	Description
April 10, 2018	Initial Draft
August 20, 2018	Updated Mercury client instructions; typographical edits
September 17, 2018	Content adjustments

Product Support

All support for this product is provided by the third-party dealer. Please contact the dealer who installed the product with questions and support requests.

©2018 Brivo Systems LLC. All rights reserved.

Brivo® is a trademark of Brivo Systems LLC. Brivo Systems LLC.,
7700 Old Georgetown Road, Suite 300, Bethesda, MD 20814