



BluKey Select™

Reference Manual

Model: BluKey Select™



Table of Contents

Table of Contents	2
Introduction	3
Before Installation.....	6
1. Create your PayRange Operator Account.....	6
2. Setup for Your Machine Installers.....	6
Installation Steps.....	7
1. Disconnect power from the machine	7
2. Open machine cabinet.....	7
3. Connect Keypad Harness to Machine Keypad and Machine Control	7
4. Connect configuration plug to CONF connector.....	8
5. Plug Keypad Harness into BluKey Select KEYPAD connector.....	8
6. Plug MDB Machine harness into BluKey Select MACHINE connector	8
7. Is Card Reader Present?	8
8. Does machine support CPD2?.....	8
9. Machine with no CPD2 support: Connect Card Reader to BluKey Select CARD connector.....	8
10. Machine with CPD1/CPD2 support: Connect Card Reader to BluKey Select MDB harness	8
11. Connect BluKey Select to Machine MDB connector	9
12. Power up the machine (leave the machine door/panel open).....	9
13. BluKey Select should power up and turn on solid blue LED	9
14. Configure BluKey Select	9
15. Power off the machine.....	9
16. Place wires and BluKey Select inside the machine	9
17. Close machine door/panel.....	9
18. Power up the machine	9
19. Verify machine operation	9
20. Place PayRange stickers on the machine	9
BluKey Select Device Configuration	9
1. Register BluKey Select device (using website).....	9
2. Register BluKey Select device (using mobile app)	10
3. Configure BluKey Select device for payment (using website)	10
BluKey Select Reference	11
Interfaces	11
Connectors	11
Absolute Maximum Ratings	11

Operating Conditions 12

ESD handling ratings 12

RF Specifications 13

Connector Pinouts 13

Mechanical..... 16

Regulatory Approval 18

 Modification statement 18

 United States..... 18

 Canada 18

 Device Labelling 18

Troubleshooting / Light Codes..... 18

Appendix B: BluKey Select Firmware Upgrade 21

Contacting PayRange Support 21

 1. For Technical Support: 21

 2. For Sales and Marketing Support:..... 21

Document History 21

Introduction

The turnkey PayRange payment system includes a BluKey hardware device for the machine along with a mobile app and transaction processing service for the consumer. Consumers maintain a prepaid balance on their smartphones and use it to make payments at a variety of machines that can include vending, amusement, parking, transit ticketing, and laundry equipment.

BluKey Select (BKSelect) device provides mobile payment functionality for vending machines with MDB and works with virtually any vending machine and other kinds of machines that accept payments from MDB payment devices. Additionally, BKSelect connects to vending machine keypads to provide customers touchless selection of product on their phone.

BKSelect supports installation into older machines that do not have MDB CPD2 but have an installed card reader.

RTC (real-time clock) support timekeeping in case of power outage.

DEX connector can support remote DEX/UCX functionality.


Installing BluKey Select takes just 2-3 minutes and requires only plugging in an appropriate cable harness into the machine.

PayRange BluKey Select™ Mobile Payment System consists of:

- BluKey Select™ (accepts payments from PayRange mobile app)
- MDB Cable Harness (usually part of the machine)
- Keypad Cable Harness (connects BluKey Select to Machine Keypad), includes Config plug

- Optional Card Harness (connects BluKey Select to Card reader installed in the Machine)
- Optional DEX Cable Harness

Vending Machine	Machine Coin/Bill Acceptor and Card Readers	Cable Harness / Installation Kit	BluKey Select™
	 	<p>MDB Machine (TBD PICTURE)</p>	
	 	<p>MDB Card (TBD PICTURE)</p>	

	(TBD PICTURE)	DEX (TBD PICTURE)	
			

Before Installation

1. Create your PayRange Operator Account

- a. Go to <http://manage.payrange.com>.
- b. Sign up for a customer account. If you already have a customer account, **Sign in**.
- c. Once logged in, click **Create an Operator Account** (may need to click **Account** first).
- d. Select **Operator Sign up** (at the bottom of the page), follow prompts to create your account.
- e. Setup ACH for payment with your bank routing and account number.

Note: Though it is possible to skip banking information, Weekly payments will commence only after banking is setup, and there are mobile sales.

- f. Issue free vend code for installation tests.

See video: <https://www.youtube.com/watch?v=Xxbb3XjKKx0>

OFFERS > Create Offer >

Offer Type: Free Vend

Description: Technician free vend offer

Max Vend Amount: <enter amount to cover wash/dry cycle>

Enter any other necessary information

Click "Create Offer" button

Copy offer codes and send them to installation technician(s) (via email or text)

2. Setup for Your Machine Installers

Prepare Installers:

- a. Download and install the PayRange app.
- b. Load funds to the app with a credit/debit card, or issue free vend code.
- c. Prepare additional point of sale material such as table tents, location flyers, and location posters. These can be downloaded free at <https://www.payrange.com/resources>.

Note: Because the PayRange device is inside the machine, the users won't know it is there unless you tell them. The more you do to promote PayRange, the quicker they will become loyal users of your machines.

- d. Provide necessary tools and supplies

i. BluKey Select device

ii. Keypad Harness for the machine

See document "Touchless Keypad Harness Summary" to choose appropriate harness.

iii. Harness for card reader (if machines are equipped with card readers)

iv. Room key and necessary building access cards

v. Operator (Installer / Service) key for the machine

vi. Smartphone, tablet or connected laptop with PayRange app

vii. Installer login & password into Operator Account

Installation Steps

These are generic installation instructions. Each individual machine and harness may have additional steps or details relevant to installation.

1. Disconnect power from the machine

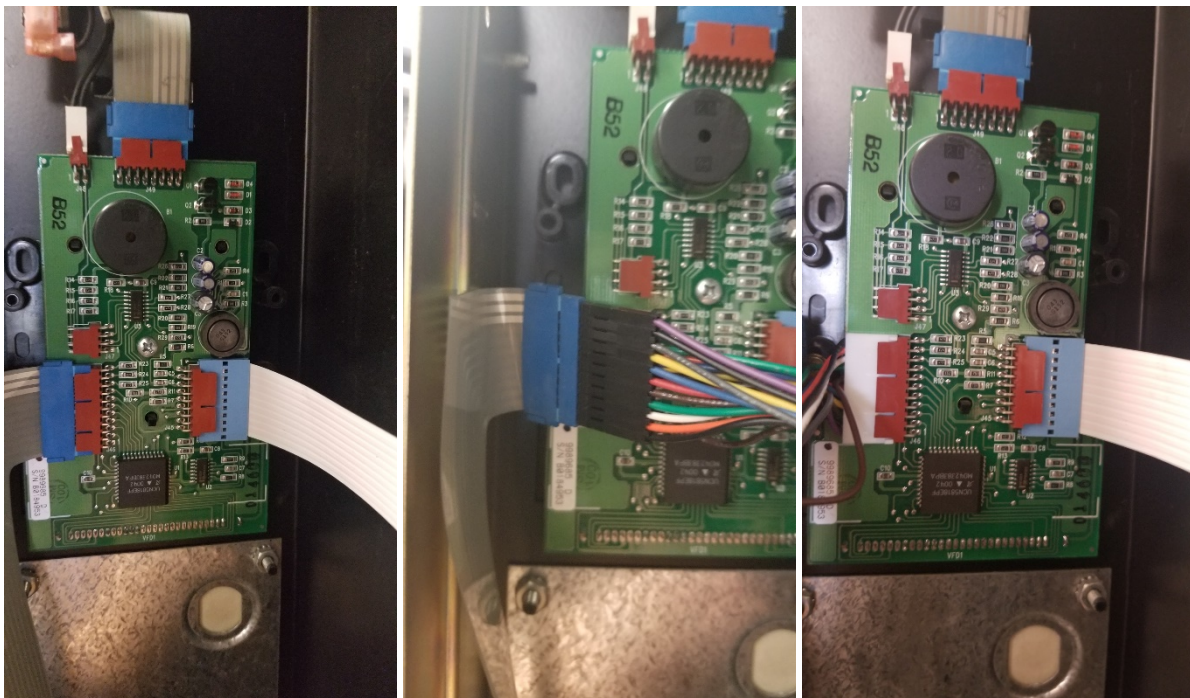
Important! Avoid electric shock and damage to the machine and BluKey Select. Always disconnect power from the machine BEFORE opening the machine cabinet.

2. Open machine cabinet

Unlock door/panel with operator/service key if needed, open the machine door/panel and position as necessary for service.

3. Connect Keypad Harness to Machine Keypad and Machine Control

See Installation Manual for the Keypad Harness. Below is a representative example.



4. Connect configuration plug to CONF connector
See Installation Manual for the Keypad Harness. (TBD PICTURES)

5. Plug Keypad Harness into BluKey Select KEYPAD connector

6. Plug MDB Machine harness into BluKey Select MACHINE connector (TBD PICTURES)

7. Is Card Reader Present?
No – Skip to step # 11

8. Does machine support CPD2?
Yes – Skip to step # 10
No – Continue to step # 9

9. Machine with no CPD2 support:
Connect Card Reader to BluKey Select CARD connector
 - a. Disconnect card reader cable from machine MDB connector
If card reader is connected to power separately, keep that connection.
 - b. Plug MDB Card harness into BluKey Select CARD connector
 - c. Plug in card reader cable into MDB Card harness

Continue to step # 11

10. Machine with CPD1/CPD2 support:
Connect Card Reader to BluKey Select MDB harness
 - a. Disconnect card reader cable from machine MDB connector

If card reader is connected to power separately, keep that connection.

- b. Plug in card reader cable into card connector on MDB harness

11. Connect BluKey Select to Machine MDB connector

12. Power up the machine (leave the machine door/panel open)

13. BluKey Select should power up and turn on solid blue LED

Note: Some machines disable payment when service panel is open – BluKey Select will be blinking red LED. Manually pressing on service panel switch should let BluKey Select turn on solid blue LED.

See section “Troubleshooting / Light Codes” on page 18 if BluKey Select does not power up or does not turn on solid blue LED.

14. Configure BluKey Select

See section “BluKey Select Device Configuration” on page 9.

15. Power off the machine

16. Place wires and BluKey Select inside the machine

Position BluKey Select near the control panel.

Tie loose cables with zip-ties.

17. Close machine door/panel

18. Power up the machine

19. Verify machine operation

Check mobile payment, coin payment, keypad vend and touchless vend and verify that PayRange app shows “Machine in Use” when vending is in progress

20. Place PayRange stickers on the machine

Place “Pay with PayRange” sticker on the machine front.

Place “PayRange overview” sticker in the room.

BluKey Select Device Configuration

1. Register BluKey Select device (using website)

Note: This can be prepared off-site, before installation.

- a. Login with your operator account to the Manage website at <https://manage.payrange.com>

- b. Click **DEVICES > Register** in the left panel
- c. Enter device Serial number and Pin (from BluKey Select back label)
- d. Enter Display name (it will be shown in the app to customers)
- e. Enter other relevant information (laundry/machine type, location name, address, etc.)
- f. Optionally: upload picture of the machine number sticker to the “Picture” field (if picture is not uploaded, a standard machine number picture will be shown in the app)
- g. If there is a PayRange decal for the machine, attach the decal to the machine. If there is a scan to pay QR code, enter Scan to Pay number from the decal

Complete device registration:

- h. Click the **Register** button to complete device registration

2. Register BluKey Select device (using mobile app)

Note: When done filling information on the screen, click **Next** button to advance. Use **Back** button if need to return and correct any information.

- a. Open PayRange app, Sign In with your operator account (if not logged in)
- b. Click on the hamburger menu (top left), select **Operator Mode > Register Device**
- c. Enter device Serial number and Pin (from BluKey Select back label), or click camera icon and scan the barcode
- d. Enter Display name (usually it is a number from machine sticker for customer)
- e. Enter other relevant information (machine type, location name, address, etc.)
- f. Note: Picture of the machine will be automatically generated.
- g. If there is a PayRange decal for the machine, attach the decal to the machine. If there is a scan to pay QR code, enter Scan to Pay number from the decal
- h. Click the **Register** button to complete device registration
- i. Proceed to section “Configure BluKey Select device for payment (using website)” below

3. Configure BluKey Select device for payment (using website)

Note: This can be prepared off-site, before installation.

- a. Login with your operator account to the Manage website at <https://manage.payrange.com>
- b. Enter device Serial number (from BluKey Select back label) into search box at the top, click **Search > Search Device**
- c. Click on the Device ID in search results to open Device view
- d. Click **Edit Device**

Complete device configuration:

- i. Click **Update**

BluKey Select Reference

Interfaces



1. DEX Connector
2. MACHINE (MDB in) Connector
3. Button
4. Power/Status LED
5. CARD LED
6. CARD (MDB out) connector
7. CONF connector
8. KEYPAD connector

Connectors

The “MACHINE” connector for connecting to MDB machine with MDB Cable Harness, KEYPAD connector for Keypad Cable Harness and CONF connector for configuration plug.

With an appropriate keypad harness and configuration plug BKSelect can be connected to keypad on any MDB machine type to provide touchless product selection.

The “CARD” MDB connector that can be used for installation into machines that only support CPD1 but already have a card reader.

Absolute Maximum Ratings

Symbol	Description	Min	Max	Unit	Notes
T _{STG}	Storage temperature	-40	85	°C	1
V _{CCDCF_MAX}	MDB/GND Power supply, DC (filtered)	-0.3	50	VDC	peak
V _{CCDCU_MAX}	MDB/GND Power supply, DC (unfiltered)	-0.3	50	VDC	peak
I _{CARDDC_OUT_PK}	MDB_OUT/GND output current		2000	mA	peak

I _{DD30_MAX}	CONF 3.3V power supply output, DC	-	300	mA	
V _{DI}	Digital input voltage	-0.3	V _{DD} + 0.3	V	2
I _{DO}	Digital output current		±50	mA	
V _{KEY_MAX}	KEYPAD connector operating voltage		60	VDC	
I _{KEY_MAX}	KEYPAD connector operating current		100	mA	

1. Determined according to JEDEC Standard JESD22-A103, High Temperature Storage Life.
2. V_{DD} is 3.3V internal reference on CONF connector.

Operating Conditions

Symbol	Description	Min	Typ	Max	Unit
T _O	Operating temperature range	-30	-	70	°C
V _{CCDC}	MDB/GND Power supply, DC	9	34	41	VDC
I _{CC34}	Power supply current, max (@ 34VDC)	-	-	90	mA
U _{CC}	Power consumption	-	-	3.03	W (1)
I _{CARDDC_OUT}	MDB_OUT/GND output current	-	-	1000	mA
V _{DD30}	CONF 3.3V power supply output, DC	+3.13	-	+3.47	V
I _{DD30}	CONF 3.3V power supply output, DC	-	-	100	mA
I _{MDBIL}	MACHINE connector input current low	-	-	100	µA
I _{MDBIH}	MACHINE connector input current high @4V	-	-	15	mA
I _{MDBOL}	MACHINE connector output current low	-	-	30	µA
I _{MDBOH}	MACHINE connector output current high @1V	-	-	15	mA
I _{MDBOSNIFF}	MACHINE connector output sniff current	-	-	0.45	mA
I _{VMCIL}	CARD connector input current low	-	-	1	mA
I _{VMCIH}	CARD connector input current high @1V	15	-	-	mA
I _{VMCOL}	CARD connector output current low	-	-	100	µA
I _{VMCOH}	CARD connector output current high @4V	100	-	-	mA
V _{CONFIL}	CONF Input logic level low			V _{DD} *0.4	V (2)
V _{CONFIH}	CONF Input logic level high	V _{DD} *0.6+0.4	-	-	V (2)
V _{CONFOH}	Output high voltage (I _O = -32mA)	V _{DD} -0.7	-	-	V (2)
V _{CONFOL}	Output low voltage (I _O = +32mA)	-	-	0.55	V
R _{KEY}	KEYPAD connector closed contacts resistance	-	-	50	Ohm

1. Power consumption excludes load on CARD connector by external card reader.
2. V_{DD} is 3.3V internal reference on CONF connector.

ESD handling ratings

Symbol	Description	Min.	Max.	Unit	Notes
V _{HBM}	Electrostatic discharge voltage, human body model	-2000	+2000	V	1
V _{CDM}	Electrostatic discharge voltage, charged-device model	-500	+500	V	2
I _{LAT}	Latch-up current at ambient temperature of 105°C	-100	+100	mA	3

1. Determined according to JEDEC Standard JESD22-A114, Electrostatic Discharge (ESD) Sensitivity Testing Human Body Model (HBM).

2. Determined according to JEDEC Standard JESD22-C101, Field-Induced Charged-Device Model Test Method for Electrostatic-Discharge-Withstand Thresholds of Microelectronic Components.
3. Determined according to JEDEC Standard JESD78, IC Latch-Up Test.

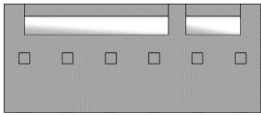
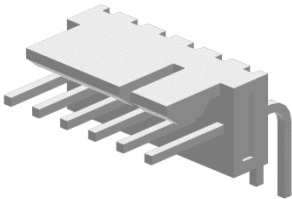

RF Specifications

Symbol	Description	Min.	Max.	Unit	Notes
F_{RF}	RF Frequency range (Bluetooth 4.1)	2402	2483.5	MHz	
P_{RFO}	RF Output power		4.91	dBm	
S_{RFI}	RF Sensitivity (at 0.1% BER)	TBD		dBm	

Connector Pinouts

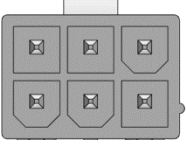
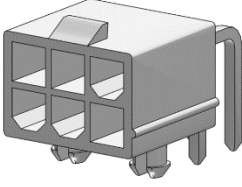

- a. “MACHINE” (MDB in) Connector (6-pin)

“MACHINE” connector is suitable for powering BluKey Select from 24V AC, 12VDC and other low-voltage power supplies and has inputs for low-voltage signals.

“MACHINE” Connector		BluKey Select	Cable / Mating part
			
		Molex 22-05-3061 (KK254)	Molex 0022013067
Pin	Name	Notes	
1	MDB_COM	MDB data common	
2	MDB_TXD	MDB transmit data (BKSelect input)	
3	MDB_RXD	MDB receive data (BKSelect output, Sniff input)	
4	(NC)		
5	MDB_GND	MDB power supply common	
6	MDB_V	MDB power supply	

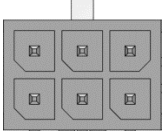


- b. “CARD” (MDB out) Connector (6-pin)

“CARD” connector is to support additional card reader.

“CARD” Connector		BluKey Select	Cable / Mating part
			
		Molex 0039301060 (Mini-Fit Jr)	Molex 0039012060
Pin	Name	Notes	
1	MDB_OUT	MDB power supply (pass through from MACHINE)	
2	MDB_GND	MDB power supply common	
3	(NC)		
4	VMC_RXD	MDB VMC receive data (BKSelect input)	
5	VMC_TXD	MDB VMC transmit data (BKSelect output)	
6	VMC_GND	MDB data common	

c. “CONF” Connector (6-pin)

“CONF” connector is provided to select Keypad harness configuration.

“CONF” Connector		BluKey Select	Cable / Mating part
			
		Molex 0430450601 (Micro-Fit)	Molex 0430250600
Pin	Name	Notes	
1	CONF0	Config input	
2	CONF1	Config input	
3	CONF2	Config input	
4	CONF3	Config input	
5	3V3_OUT	3.3V output	
6	GND	Ground	


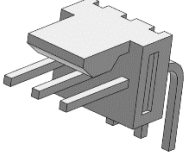
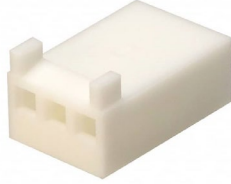
d. “KEYPAD” Connector (24-pin)

“KEYPAD” connector is provided for Keypad harness.

"KEYPAD" Connector		BluKey Select	Cable / Mating part
			
		Molex 0430452400 (Micro-Fit)	Molex 0430252400
Pin	Name	Notes	
1	KEY_COM	Common for all KEYn	
2	KEY1		
3	KEY2		
4	KEY3		
5	KEY4		
6	KEY5		
7	KEY6		
8	KEY7		
9	KEY8		
10	KEY9		
11	KEY10		
12	KEY11		
13	KEY_COM	Common for all KEYn	
14	KEY1		
15	KEY2		
16	KEY3		
17	KEY4		
18	KEY5		
19	KEY6		
20	KEY7		
21	KEY8		
22	KEY9		
23	KEY10		
24	KEY11		

e. "DEX" (UCX) Connector (3-pin)

"DEX" connector is for permanent connection to vending machine DEX port.

“DEX” Connector		BluKey Select	Cable / Mating part
			
		Molex 22-05-3031 (KK254)	Molex 0022013037
Pin	Name	Notes	
1	GND	DEX data common	
2	DEX_TIP_RXD	DEX receive data (BKSelect input)	
3	DEX_RING_TXD	DEX transmit data (BKSelect output)	

f. “Battery Connector Pinout

BKSelect battery connector is JST SM02B-SURS-TF (2-pin) to connect backup battery for the internal real-time-clock.

Pin	Name	Notes
1	3V_IN	(+) 3V from battery
2	GND	(-) Common

Notes:

- Recommended CR1632. Only lithium-based 3V watch coin cell batteries are supported (e.g. CR2016, CR2032).

g. Recommended Mating Parts

MACHINE Connector: Molex 0022013067 (KK254)

CARD Connector: Molex 0039012060 (Mini-Fit Jr.)

Battery Connector: JST 02SUR-32S

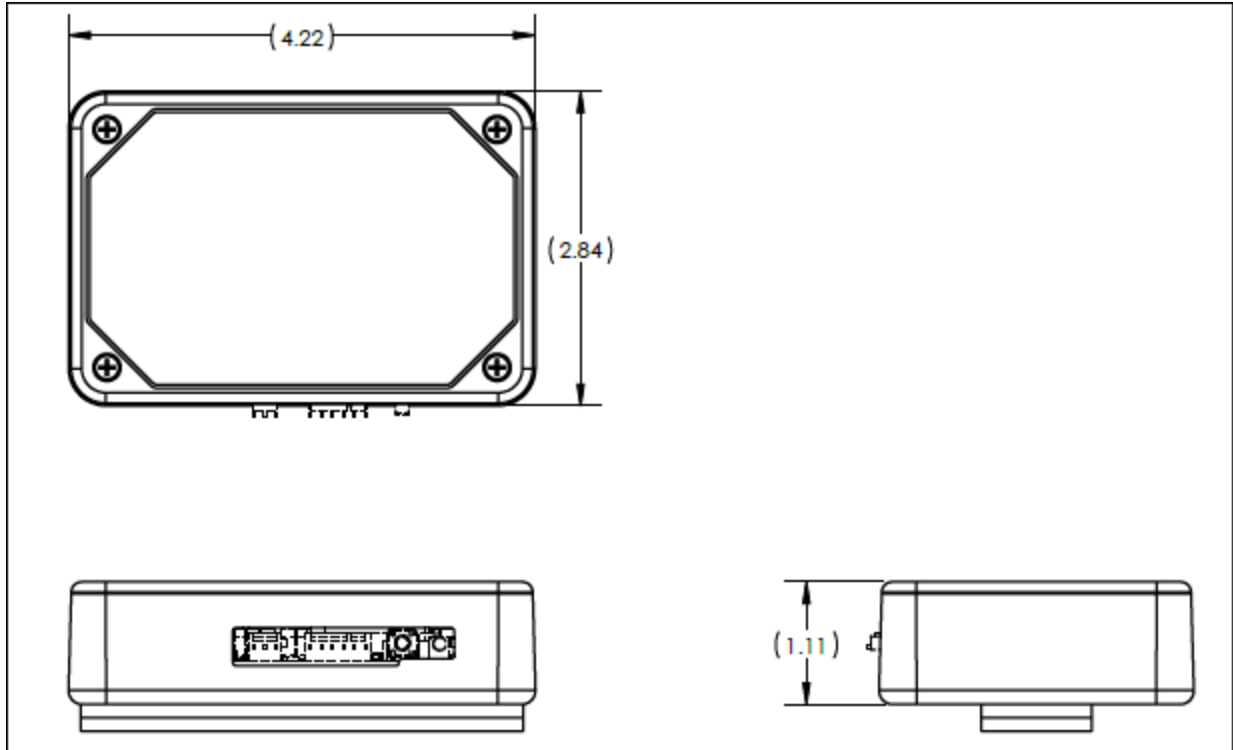
DEX Connector: Molex 0022013037 (KK254)

CONF Connector: Molex 0430250600 (Micro-Fit)

KEYPAD Connector: Molex 0430252400 (Micro-Fit)

Mechanical

BluKey Select dimensions (inches) are given in the following figure.



Regulatory Approval

Modification statement

PayRange has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.

United States

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

To satisfy RF exposure requirements, this device and its antenna must operate with a separation distance of at least 20 cm from all persons.

Canada

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:
 (1) This device may not cause interference; and
 (2) This device must accept any interference received, including interference that may cause undesired operation of the device.

To satisfy RF exposure requirements, this device and its antenna must operate with a separation distance of at least 20 cm from all persons.


Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:
 (1) l'appareil ne doit pas produire de brouillage, et
 (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Pour satisfaire aux exigences d'exposition RF, cet appareil et son antenne doivent fonctionner à une distance de séparation d'au moins 20 cm de toutes les personnes.

Device Labelling

FCC ID: 2AF78-01778
 IC: 21341-01778 10.01778

Troubleshooting / Light Codes

Symptom	LED Pattern	Cause	Fix
BKSelect LED is solid blue		BluKey Select ready	(Normal operation)
		Machine not powered	Power on the machine

Symptom	LED Pattern	Cause	Fix
BKSelect LED does not light up	 (No power)	Power is not provided on machine's harness	Check / reconnect harness connectors. Use alternative power source per section " Error! Reference source not found. "
		Harness not compatible	Check and select appropriate harness type
BKSelect LED is solid red		BluKey Select is in wrong mode	Contact PayRange for support
BKSelect LED slowly flashes red	 (Disabled by machine)	Machine is not accepting payments	Refer to machine manual to enable payments / return to enabled state.
BKSelect LED slowly flashes red/blue	 (Machine in use)	Machine is in use	Wait for machine to complete its cycle. Machine accepts payments (top-off).
BKSelect LED blinks off	 (Coin drop)	Coin drop detected	(Normal operation)
BKSelect LED flashes series of red/blue		No payments for last 24 hours	Power-cycle BluKey Select to reset the warning. Check if machine has any problems running.
BKSelect LED slowly flashes blue		Communicating with App	(Normal operation)
BKSelect LED slowly flashes purple		Transaction in progress	(Normal operation)
BKSelect LED quickly flashes blue		Upgrading	Keep power on until done
BKSelect LED quickly flashes red		BluKey Select hardware error	Replace BluKey Select
BKSelect LED quickly flashes blue, flashes red, repeats		BluKey Select hardware error	Replace BluKey Select
BKSelect LED quickly flashes purple		Uploading transactions, Downloading upgrades	(Normal operation)
Mobile payment does not work		<ol style="list-style-type: none"> 1. Check if BluKey Select is in Ready state / BluKey Select LED is solid blue. 2. Check if BluKey Select flashes "Transaction in progress" LED pattern during mobile payment. If not, check Internet / data connection on mobile device. 3. If using pulse mode, check if "pulse on" time in device settings in Manage is set correctly (see section "Configure BluKey Select device for payment (using website)"). 	
Coin count does not work		<ol style="list-style-type: none"> 1. Check connection to coin acceptor sensor/switch. 2. Check for correct polarity of connection to coin acceptor sensor/switch. 	

Symptom	LED Pattern	Cause	Fix
		3. Check if coin count input is configured properly for the harness in Manage (see section “ Error! Reference source not found. ”).	
App does not show “Machine in Use” during cycle		1. Check harness connection to BKSelect and to machine 2. Check if Inhibit/Available signals are configured properly for the harness in Manage (see section “ Error! Reference source not found. ”).	
Machine does not accept coins		1. Check if machine accepts coins if BluKey Select harness is disconnected from the machine’s coin harness (can disconnect harness from BluKey Select). If not, replace coin acceptor and its harness. 2. Check machine’s wiring (a loose wire in connector pin could be causing coin sensor/switch disconnects). 3. For optical coin sensors: Clean coin sensor optics or replace coin sensor or coin acceptor assembly.	

Appendix B: BluKey Select Firmware Upgrade

PayRange may release firmware updates with new functionality and improvements.

BKSelect firmware is upgraded automatically, in the background.

Contact PayRange support for additional information on firmware upgrades.

Contacting PayRange Support

For assistance with installing and operating your BluKey Select devices, please contact our support group:

1. For Technical Support:

2. For Sales and Marketing Support:

Phone: +1 (855) 856-6398 (menu option 1)

Phone: +1 (855) 856-6398 (menu option 2)

Email: support@payrange.com

Email: sales@payrange.com

Document History

Part Number 23.00xxx-xx

Issue	Date	Reason
0.1	25 May 2021	Initial Release – DRAFT 1

(Trademarks)