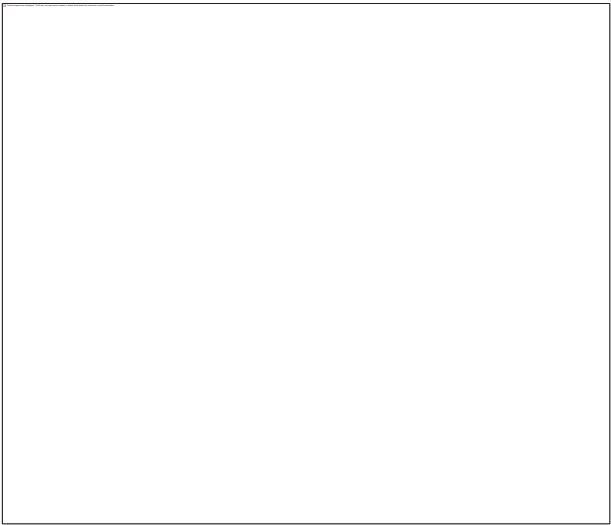


# PayRange BluKey Pro™

## Product Information

### Models:

- BluKey Pro™ 18cdr | 18-pin | Card
- BluKey Pro™ 12cd | 12-pin | Card
- BluKey Pro™ 12d | 12-pin



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## 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 customer. 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 Pro (BKPro) device provides mobile payment functionality and works with virtually any commercial Laundry machine and other kinds of machines that accept payments.

Card-enabled models support machines with installed card reader (serial and pulse).

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

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

## Interfaces



1. CARD connector  
(present only on  
card-enabled models)
2. Power LED
3. Button
4. MACHINE Connector

## Installation

BluKey Pro requires electrical connections to internal machine signals with appropriate cable harness.

BluKey Pro should be placed inside machine enclosure, with the following considerations:

- Optimal placement for RF performance (place device close to openings in metal enclosure, ensure that its internal antenna is not obstructed by metal and conductive parts, shields and cables).
- Cable harness should reach machine connectors.
- Do not place on vibrating parts (motors, compressors, etc.).
- Do not place where can be exposed to water or condensate, or high heat or extremely cold temperatures.

## PayRange Mobile Payment System

PayRange Mobile Payment System consists of:

- BluKey Pro™ (accepts payments from PayRange mobile app)
- Cable Harness (connects BluKey Pro to Laundry Machines)
- Optional Card Harness (connects BluKey Pro to Card reader installed in the Laundry Machine)

### Laundry Machine



### Machine Coin Acceptor and Card Readers



### Cable Harness



### BluKey Pro™



## 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.

### 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 Pro device*

ii. *Harness for the machine*

See section "BluKey Pro Machine Harness Selection Guide" below 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. *Wire cutters*

vii. *Pliers (for splice crimping)*

viii. *Smartphone, tablet or connected laptop with PayRange app*

ix. *Installer login & password into Operator Account*

## BluKey Pro Machine Harness Selection Guide

There are many brands and models of laundry machines. This document contains only brief information on how to select harness appropriate for a given laundry machine.

PayRange sales team has more advanced tools and can decode machine information from full model and serial numbers and advise required harnesses and installation instructions.

The following sections provide steps to identify machine type, cover supported machine interfaces and available harnesses.

After selecting harness for the machine, review notes for that harness in section “**Error! Reference source not found.**” **Error! Reference source not found.** There might be some additional considerations and necessary steps.

To determine which harness to use, locate machine control board and identify available connector type, then choose harness corresponding to the connector type.

### 1. Speed Queen and Alliance Laundry Systems Machines

#### a. ACA type (including MGD)

If machine has black plastic case holding the control board and the control board has 7-pin cashless connector:

- 7-pin connector is not used (no card reader): Use C2/D2 harness
- 7-pin connector is used (machine has card reader)
  - Pulse mode: Use C7/D7 harness if coin slot is not installed, and C8/D8 harness if coin slot is installed.
  - Serial mode: Use C2/D2 harness for machine-side connection and connect card reader to “CARD” with appropriate card reader harness.

#### b. MDC type

If machine has grey metal case holding the control board and the control board has 7-pin cashless connector:

- 7-pin connector is not used (no card reader): Use C1/D1 harness
- 7-pin connector is used (machine has card reader)
  - Pulse mode: Use C7/D7 harness if coin slot is not installed, and C8/D8 harness if coin slot is installed (note that coin is disabled on MDC controls for serial card readers). Harness power connector will have to be cut off and wires spliced to machine 24VAC power.
  - Serial mode: Use C1/D1 harness for machine-side connection and connect card reader to “CARD” with appropriate card reader harness.

#### c. NetMaster type

If machine has grey metal case holding the control board and the control board has 4-pin cashless connector:

- 4-pin connector is not used (no card reader) - Use C4/D4 harness
- 4-pin connector is used (machine has card reader)
  - Pulse mode: Use C7/D7 harness if coin slot is not installed, and C8/D8 harness if coin slot is installed. Harness power connector will have to be cut off and wires spliced to machine 24VAC power.
  - Serial mode: NetMaster not supported in pulse mode.

## 2. Maytag and Some Whirlpool Machines

### a. Px type (with 6-pin connector)

If machine has control board with 6-pin cashless connector:

- 6-pin connector is not used (no card reader) - Use C3/D3 harness
- 6-pin connector is used (machine has card reader) – Use C3/D3 harness and connect card reader to “CARD” with appropriate card reader harness.

### b. ADC type (without 6-pin connector)

If machine has control board without 6-pin cashless connector:

- If machine has no card reader – Use C6/D6 harness
- If machine has card reader installed: contact PayRange for support.

## 3. LG Machines

### a. C type

If machine has front panel harness with cashless connectors:

- cashless connectors are not used (no card reader) - Use C5/D5 harness
- cashless connectors are used (machine has card reader) – Use C5/D5 harness and connect card reader to “CARD” with appropriate card reader harness.

## 4. Other Machine Types

Contact PayRange for support.

## 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

### 2. Open machine cabinet

Unlock panel with operator/service key, position the panel as necessary for service.

### 3. Connect harness to BluKey Pro

4. Connect Coin Acceptor connectors:

- a. Disconnect machine's Coin Acceptor harness connector (if present)
- b. Plug in pass-through Coin Acceptor connectors into Coin Acceptor connector and machine's harness connector

If Coin Acceptor is not present on the machine but machine has Coin Acceptor harness, plug in only one connector.

Coin Acceptor is not required for BKPro operation.

5. Power up the machine (leave the control panel open)

6. BluKey Pro should power up and turn on solid blue LED

See section "Troubleshooting / Light Codes" on page 11 if BluKey Pro does not power up or does not turn on solid blue LED.

7. Configure BluKey Pro

See section "BluKey Pro Device Configuration " on page 8.

8. Configure machine

See section "Machine Controller Programming" on page 7.

9. Power off the machine

10. Place wires and BluKey Pro inside the machine

Fix BluKey Pro with adhesive fastener tape.

11. Close machine control panel

12. Power up the machine

13. Verify machine operation

Check mobile payment, coin payment, start cycle and verify that PayRange app shows "Machine in Use"

## Machine Controller Programming

BKPro can connect to various payment accepting inputs: coin, debit, serial. Depending on machine, harness and chosen operation mode (pulse or serial) of BKPro, machine should be programmed to work in the chosen mode and have the input activated. Follow the below sections to program Laundry machine.

### 1. Using Coin Inputs

For harnesses connecting to coin inputs and using pulse mode (e.g. C7/L7 and C8/L8) – if machine has Coin Acceptor connector, but Coin Acceptor is not installed, enable Coin Acceptor input to receive mobile payments. Follow these steps:

- a. Locate programming guide for the machine
- b. Open machine service door with operator key
- c. Consult the guide and follow the steps to enable Coin Acceptor
- d. Set coin payment value to match BKPro pulse settings
- e. Close the service door

### 2. Using Debit Inputs

For harnesses connecting to debit inputs and using pulse mode (e.g. C1/L1, C2/L2, C3/L3 and C4/L4) – if machine has Debit connector, enable Debit input to receive mobile payments. Follow these steps:

- a. Locate programming guide for the machine
- b. Open machine service door with operator key
- c. Consult the guide and follow the steps to enable Debit connector
- d. Set Pulse mode (turn off serial mode)

**Note:** some machines require jumper plug to enable serial mode. Remove the plug to turn off serial mode.

- e. Set debit payment value to match BKPro pulse settings
- f. Close the service door

### 3. Using Serial Mode

For harnesses connecting to debit inputs and using serial mode (e.g. C1/L1, C2/L2, C3/L3 and C4/L4) – if machine has Debit connector, enable Debit input and serial mode to receive mobile payments. Follow these steps:

- a. Locate programming guide for the machine
- b. Open machine service door with operator key
- c. Consult the guide and follow the steps to enable Debit connector
- d. Set Serial mode (turn on serial mode)

**Note:** some machines require jumper plug to enable serial mode.

- e. Close the service door

## BluKey Pro Device Configuration

### 1. Register BluKey Pro 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 Pro back label)
- d. Enter Display name (it will be shown in the app to customers)
- e. Enter other relevant information (location name, address, etc.)
- f. Take a picture of the machine and upload to the “Picture” field
- g. If there is a PayRange decal for the machine, attach the decal to the machine. If there is scan to pay QR code, enter Scan to Pay number from the decal
- h. Configure the device to Auth Type: Pulse, Cash Value per Pulse: **0.25**
- i. Set Pulse on: / Pulse off: to match Bill Acceptor timings required for the machine controller (see machine documentation)
- j. Add Credits/Pulse/Amount in “Configure Multi Credit” section (match machine prices)
- k. Configure harness: Select harness from the list, enter money values for cash counter pulses, review options for each signal (click “edit” icon on the right).
- l. Click the **Register** button to complete device registration

## 2. Register BluKey Pro 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 Pro 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 (location name, address, etc.)
- f. Take a picture of the machine
- g. If there is scan to pay PayRange decal for the machine, Enter Scan to Pay number from the sticker, attach the sticker to the machine
- h. Click the **Register** button to complete device registration
- i. Proceed to section “Configure BluKey Pro device for payment (using website)” below

## 3. Configure BluKey Pro 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 Pro 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**
- e. Configure the device to Auth Type: Pulse, Cash Value per Pulse: **0.25**

- f. Set Pulse on: / Pulse off: to match Bill Acceptor timings required for the machine controller (see machine documentation)
- g. Add Credits/Pulse/Amount in “Configure Multi Credit” section (match machine prices)
- h. Configure harness: Select harness from the list, enter money values for cash counter pulses, review options for each signal (click “edit” icon on the right).
- i. Click **Update**

## Card Reader Harnesses Reference

### Card Reader Harnesses Summary

Name	Part Number	Description
R1	11.01213-xx	DIY
R2	11.01214-xx	Heartland 8-pin
R3	11.01215-xx	Greenwald 8-pin
R4	11.01216-xx	KioSoft 10-pin

#### R1 | 11.01213-00 | DIY Card Reader Harness

R1 harness supports any card reader, but it requires customer to splice wires into existing card reader connector.

#### R2 | 11.01214-00 | Heartland Card Reader Harness

R2 harness supports Heartland card readers with 8-pin Molex Micro-Fit connector.

**Attention!** Greenwald and Heartland connectors are the same but have different pinouts (2 pins swapped). Using incorrect harness may damage BKPro device and Card Reader.

#### R3 | 11.01215-00 | Greenwald Card Reader Harness



R3 harness supports Greenwald card readers with 8-pin Molex Micro-Fit connector.










**Attention!** Greenwald and Heartland connectors are the same but have different pinouts (2 pins swapped). Using incorrect harness may damage BKPro device and Card Reader.

#### R4 | 11.01216-00 | Heartland Card Reader Harness

R4 harness supports KioSoft card readers with 10-pin Molex Micro-Fit connector.

## Troubleshooting / Light Codes

Symptom	LED Pattern	Cause	Fix
BKPro LED is solid blue		BluKey Pro ready	(Normal operation)
BKPro LED does not light up		Machine not powered	Power on the machine
		Power is not provided on machine's harness	Use alternative power source per section " <b>Error! Reference source not found.</b> "
		Harness connection	Check / reconnect harness connectors

BKPro LED is solid red		BluKey Pro is in wrong mode	Contact PayRange for support
BKPro LED slowly flashes red	 (Disabled by machine)	Machine is not accepting payments	Refer to machine manual to enable payments / return to enabled state.
BKPro LED slowly flashes TBD	 (Machine in use)	Machine is in use	Wait for machine to complete its cycle.  TBD: both in use and no payment?
BKPro LED flashes series of red/blue		No payments for last 24 hours	Power-cycle BluKey Pro to reset the warning. Check if machine has any problems running.
BKPro LED slowly flashes blue		Communicating with App	(Normal operation)
BKPro LED slowly flashes purple		Transaction in progress	(Normal operation)
BKPro LED quickly flashes blue		Upgrading	Keep power on until done
BKPro LED quickly flashes red		BluKey Pro hardware error	Replace BluKey Pro
BKPro LED quickly flashes purple		Uploading transactions, Downloading upgrades	(Normal operation)
Mobile payment does not work		<ol style="list-style-type: none"> <li>1. Check if BluKey Pro is in Ready state / BluKey Pro LED is solid blue.</li> <li>2. Check if BluKey Pro flashes “Transaction in progress” LED pattern during mobile payment. If not, check Internet / data connection on mobile device.</li> <li>3. If using pulse mode, check if “pulse on” time in device settings in Manage is set correctly (see section “Configure BluKey Pro device for payment (using website)”).</li> </ol>	
Coin count does not work		<ol style="list-style-type: none"> <li>1. Check connection to coin acceptor sensor/switch.</li> <li>2. Check for correct polarity of connection to coin acceptor sensor/switch.</li> <li>3. Check if coin count input is configured properly for the harness in Manage (see section “Machine Controller Programming”).</li> </ol>	
App does not show “Machine in Use”		<ol style="list-style-type: none"> <li>1. Check harness connection to BKPro and to machine</li> <li>2. Check if Inhibit/Available signals are configured properly</li> </ol>	

during cycle

for the harness in Manage (see section “Machine Controller Programming”).

Machine does not  
accept coins

1. Check if machine accepts coins if BluKey Pro harness is disconnected from the machine’s coin harness (can disconnect harness from BluKey Pro). 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.

## Regulatory Approval & Warnings

### 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

### 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.

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.

### Device Labelling

FCC ID: 2AF78-01046

IC: 21341-01046

## Contacting PayRange Support

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

1. For Technical Support:

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

**Email:** [support@payrange.com](mailto:support@payrange.com)

2. For Sales and Marketing Support:

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

**Email:** [sales@payrange.com](mailto:sales@payrange.com)

## Appendix A: Price Setup

When you register or edit the device, you can also set up the price. Here are some guidelines:

- Price per credit is the total price to play the machine
- Cash value per pulse is how much money each pulse is worth
- Pulses per credit is how many pulses it takes to get to the total price
- Pulse on (ms) and Pulse off (ms) is the length of the pulse for the particular machine. This defaults to 100, if left blank

<b>Auth Type</b>	Pulse
<b>Price per Credit</b>	0.50
<b>Cash Value per Pulse</b>	0.25
<b>Pulse(s) per credit</b>	2
<b>Pulse on (ms)</b>	100
<b>Pulse off (ms)</b>	100



## Appendix B: BluKey Pro Firmware Upgrade

PayRange may release firmware updates with new functionality and improvements.

BKPro firmware is upgraded automatically, in the background. Contact PayRange support for additional information on firmware upgrades.

## Appendix C: Splicing Wires

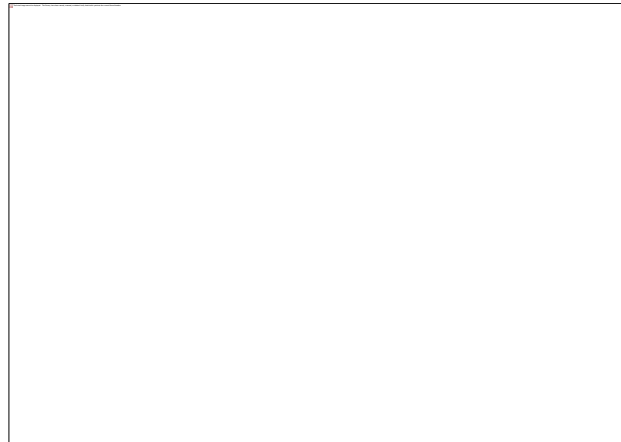
On some machines power has to be taken from machine's wiring harness or credit wires have to be spliced to coin switch wiring harness. Use the following procedure to splice wires.

1. Splicing harness wires directly to machine wires (do this procedure for both wires)

Insert one of the machine wires  
leading into the control board into  
the pass through of the splice

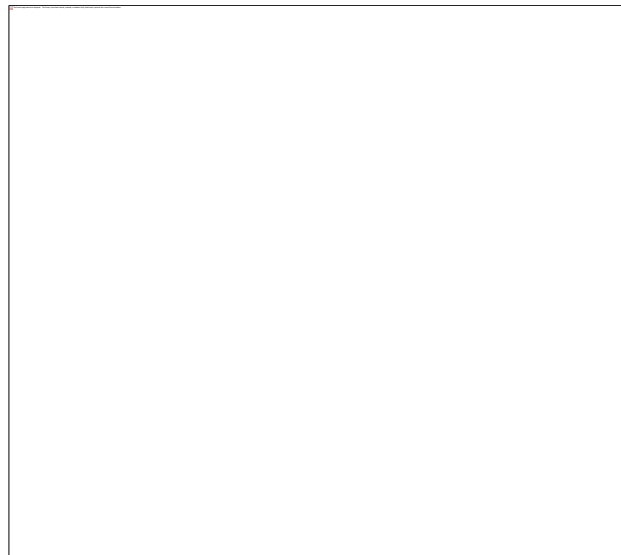
**Note:** Photo shows splice with metal  
brace pulled out for clarity.

Do not remove metal brace, but make  
sure it is pulled out enough so the wire  
can be fully inserted.



Close the 1<sup>st</sup> part of the tab

**Note:** Photo shows splice with metal  
brace pulled out for clarity.



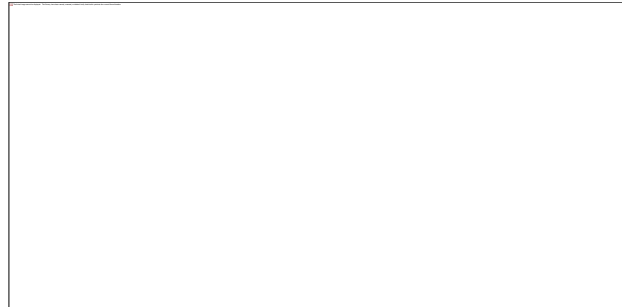
Insert one of the wires from BluKey Pro harness into the stopped opening of the splice until it hits the end of the opening.

**You may need to clip the wire from harness connector that is not going to be used.**

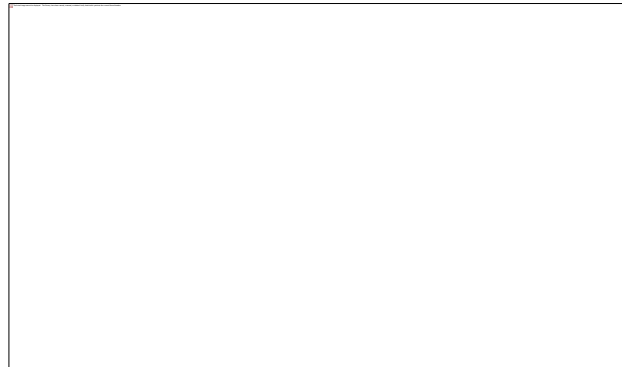
**You should be able to see the wire in the window by the metal brace.**



Crimp the metal brace into the wires (with pliers), until brace is flush with the splice case.



Close the cover. Check that wire cannot be pulled out with slight tug.



## Appendix D: Specifications

### 2. BluKey Pro Models

Model	Part Number	MACHINE Connector	CARD Conn.	Notes
BluKey Pro 18cdr	10.01261	18 pins	•	
BluKey Pro 12cd	10.01265	12 pins	•	
BluKey Pro 12d	10.01267	12 pins		

Model Suffix	CARD Conn.	Coin1	Coin2	Relay	External Battery	Internal Battery	Mnemonic	Notes
<i>c</i>	•						card	accepts <b>Dx</b> harness
<i>d</i>		•	•				dual coin	
<i>r</i>				•			relay	18-pin only

In addition to these models, the timekeeper battery is optional, and can be installed internally or externally.

### 3. Absolute Maximum Ratings

Symbol	Description	Min	Max	Unit	Notes
T <sub>STG</sub>	Storage temperature	-40	85	°C	1
V <sub>CC</sub>	AC1/GND Power supply, DC	-0.3	55	VDC	peak
V <sub>CC</sub>	AC1/AC2 Power supply, AC (rms)	0	39	VAC	peak
V <sub>DDO</sub>	5V_OUT power supply output, DC	+4.75	+5.25	V	
I <sub>DDO</sub>	5V_OUT power supply output, DC	-	100	mA	
V <sub>DDI</sub>	5V_IN power supply input, DC	-0.5	+6.5	V	
V <sub>DI</sub>	Digital input voltage	-0.3	V <sub>DD</sub> + 0.3	V	2
I <sub>DO</sub>	Digital output current		±50	mA	
V <sub>HVDO</sub>	HVOUT pins relay contacts voltage, AC (rms)	-	240	VAC	3
V <sub>HVDO</sub>	HVOUT pins relay contacts voltage, DC (peak)	-	400	VDC	3
I <sub>HVDO</sub>	HVOUT pins relay contacts current	-	0.120	A	3

1. Determined according to JEDEC Standard JESD22-A103, High Temperature Storage Life.
2. V<sub>DD</sub> is 5V\_OUT on MACHINE connector, and 5V\_IN on CARD connector.
3. Maximum switching power (V<sub>PK</sub> \* I<sub>PK</sub>) 48VA.

#### 4. Operating Conditions

Symbol	Description	Min	Typ	Max	Unit
T <sub>O</sub>	Operating temperature range	-30	-	85	°C
V <sub>CC</sub>	AC1/GND Power supply, DC	9	12	50	VDC
V <sub>CC</sub>	AC1/AC2 Power supply, AC (rms)	16	24	29	VAC
I <sub>CC</sub>	Power supply current, max (@ 9VDC or 16VAC)	-	-	575	mA
U <sub>CC</sub>	Power consumption	-	-	3.8	W (1)
V <sub>DDO</sub>	5V_OUT power supply output, DC	-	+5.0	-	V
V <sub>DDI</sub>	5V_IN power supply input, DC	+1.65	+5	+5.5	V
I <sub>DDI</sub>	5V_IN power supply input, DC	-	-	62	mA
V <sub>IL</sub>	Input logic level low			V <sub>DD</sub> *0.4	V (2)
V <sub>IH</sub>	Input logic level high	V <sub>DD</sub> *0.6+0.4	-	-	V (2)
V <sub>OH</sub>	Output high voltage (I <sub>O</sub> = -32mA)	V <sub>DD</sub> -0.7	-	-	V (2)
V <sub>OL</sub>	Output low voltage (I <sub>O</sub> = +32mA)	-	-	0.55	V

1. Power consumption excludes load on AC1/AC2/DC\_OUT by connected card reader.
2. VDD is 5V\_OUT on MACHINE connector, and 5V\_IN on CARD connector.

#### 5. ESD handling ratings

Symbol	Description	Min.	Max.	Unit	Notes
V <sub>HBM</sub>	Electrostatic discharge voltage, human body model	-2000	+2000	V	1
V <sub>CDM</sub>	Electrostatic discharge voltage, charged-device model	-500	+500	V	2
I <sub>LAT</sub>	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.

## 6. 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		+9	dBm	
$S_{RFI}$	RF Sensitivity (at 0.1% BER)	-93		dBm	
$G_{RF}$	Antenna Gain		3.0	dBi	

## 7. Connector Pinouts

### MACHINE Connector Pinout

BKPro MACHINE connector is either 12-pin JST S12B-PUDSS or 18-pin JST S18B-PUDSS.

Pin	Name	Type	Pin	Name	Type
1	AC1	Power input	2	AC2	Power input
3	IN	Input, RxD or Inhibit	4	GND	Common
5	COIN2A	Input, isolated	6	COIN2K	Input, isolated
7	AvailableIn	Input	8	5V_OUT	Aux power output
9	OUT_NO	Output, open collector	10	COIN1HiZ	Input
11	COIN1A	Input, isolated	12	COIN1K	Input, isolated
13	ReservedOut*	Output	14	COIN2HiZ*	Input
15	HVOUT_NO*	Relay contact	16	ReservedIn*	Input
17	HVOUT_COM*	Relay contact	18	HVOUT_NC*	Relay contact

Notes:

- (\*) Pins 13-18 are not present on 12-pin BKPro models.
- Direction of input and output is given from BKPro's perspective.
- GND is common for all non-isolated inputs and outputs.
- COIN1HiZ and COIN2HiZ are referenced to GND. COIN1A/K and COIN2A/K remain isolated from GND for positive signals under 50V.
- BKPro provides up to 100mA of current on auxiliary power output 5V\_OUT.

### CARD Connector Pinout

BKPro CARD connector is JST S10B-PUDSS (10-pin). It is present only on card-enabled models.

Pin	Name	Type	Pin	Name	Type
1	TXD	Serial TX Data output	2	DC_OUT	Rectified power supply

3	IN1	Auxiliary input	4	AC2	Power supply output
5	AC1	Power supply output	6	RXD	Serial RX Data input
7	GND	Common for all signals	8	5V_IN	5V DC Input
9	OUT1	Auxiliary output	10	OUT2	Auxiliary output

**Notes:**

- Direction of input and output is given from BKPro's perspective.
- GND is common for 5V\_IN, DC\_OUT and all inputs and outputs.
- Power supply output is passed from MACHINE connector AC1/AC2 pins, can be AC or DC.
- DC\_OUT derived by rectifying and filtering input voltage provided to MACHINE connector AC1/AC2 or AC1/GND input voltage. DC\_OUT voltage depends on actual input voltage and total load (40V for 24VAC input).
- BKPro requires 5V supply voltage (up to 64mA load) provided by card reader to drive output signals and reference input signals.

**Attention:** Do not connect CARD connector AC1/AC2 to devices that have only half-wave rectifier (one of AC1/AC2 is connected to GND, and another is connected to single diode). Doing so will damage BKPro and card reader device. Connect GND/DC\_OUT to the card reader power input!

**Battery Connector Pinout**

BKPro Battery connector is JST SM02B-SURS-TF (2-pin). It is present only on RTC-enable models, to connect backup battery for the internal real-time-clock.

Pin	Name	Type	Pin	Name	Type
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).

**Recommended Mating Parts**

MACHINE Connector: JST PUDP-12V-S for 12-pin models, JST PUDP-18V-S for 18-pin models.

CARD Connector: JST PUDP-10V-S.

Battery Connector: JST 02SUR-32S.

**Document History**

Issue	Date	Reason
0.1	16 Nov 2018	Initial Draft
0.2	3 Apr 2019	Regulatory approvals, electrical characteristics, models.
1.0	22 Apr 2019	Combine Reference Guide and Data Sheet into User Manual, add French regulatory statement.

