On Track Innovation Ltd.

otiPulse Operation Guide

Version 1.1 (short version)

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1 Overview

OtiPulse is a modular and cost-effective solution allowing coin-operated pulse machine operators to accept cashless payment, such as credit cards, debit cards and mobile payments, and increase their income per machine.

Additionally, the solution turns the operators' business into a smart and connected one, providing cloud control of their fleet of machines with real-time status and alerts.

1.1 Package contents

1.1.1 Hardware package

Each *OtiPulse* hardware package includes the following elements:

- OTI Cashless reader – TRIO (SATURN 6500) or UNO-6 (SATURN 6700)
- OTI TeleBox (CONNECT 3000) telemetry unit
- Pulse Interface Board
- TeleBox harness (connecting cable)
- Cellular antenna
- TeleBox mounting plate
- SD Card (already assembled to the TeleBox device)
- SIM Card (already assembled to the TeleBox device)
- Cable Ties (to secure the USB cable)

2 System architecture

2.1 High level description

The following chart shows the high level connections in the Pulse system:

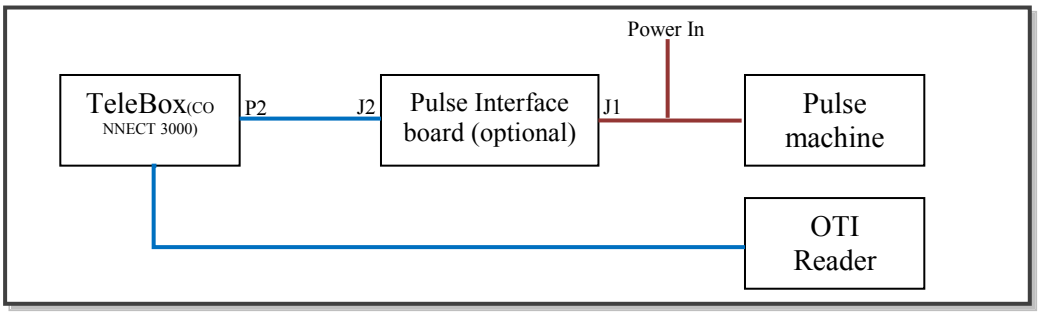


Figure 1 – High level Connection chart

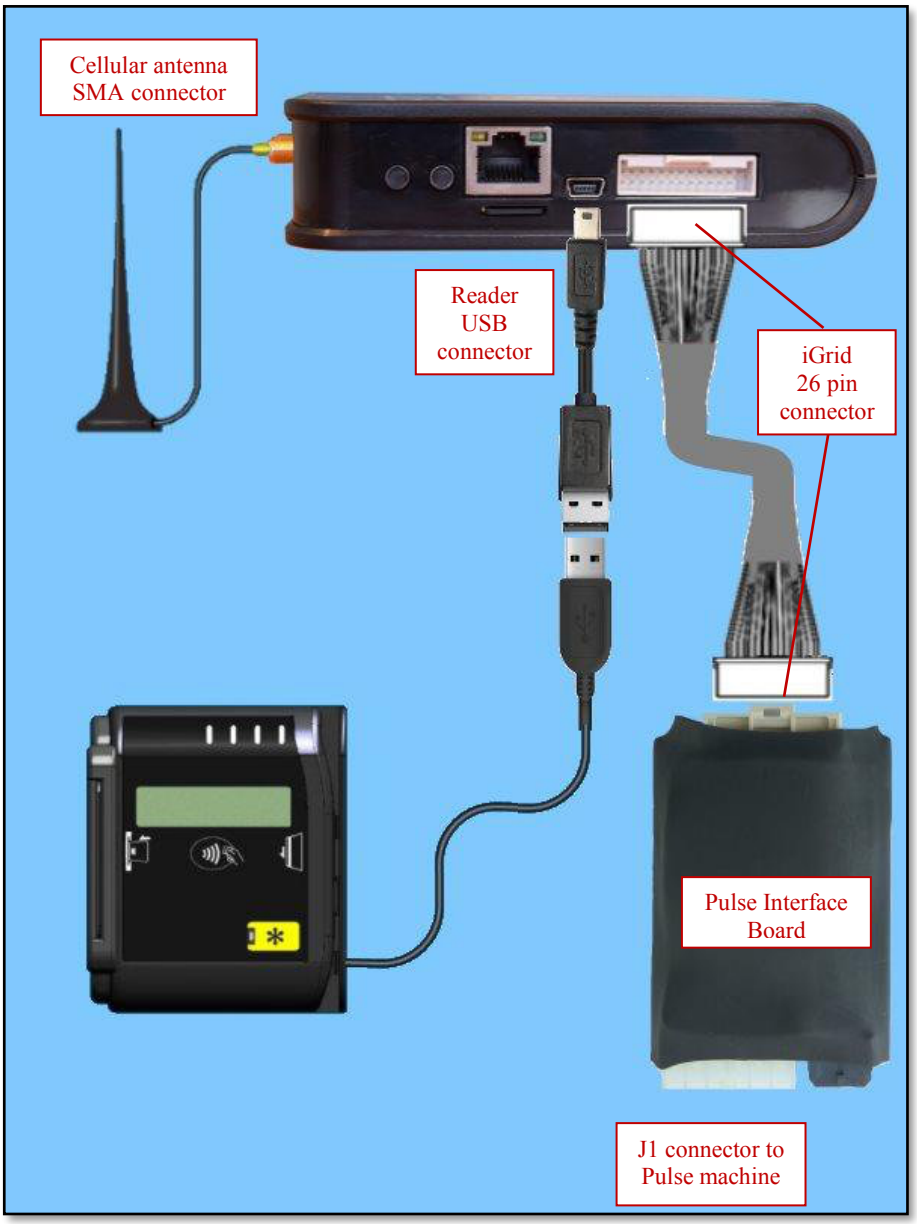


Figure 2 – Detailed connection chart

2.2 Pulse machine connection

The Pulse machine can be connected directly to the TeleBox using the 26 pin Molex connector, or via the Pulse Interface board.

2.2.1 Direct connection

When using a direct connection between the TeleBox and the Pulse machine, use the following connection charts.

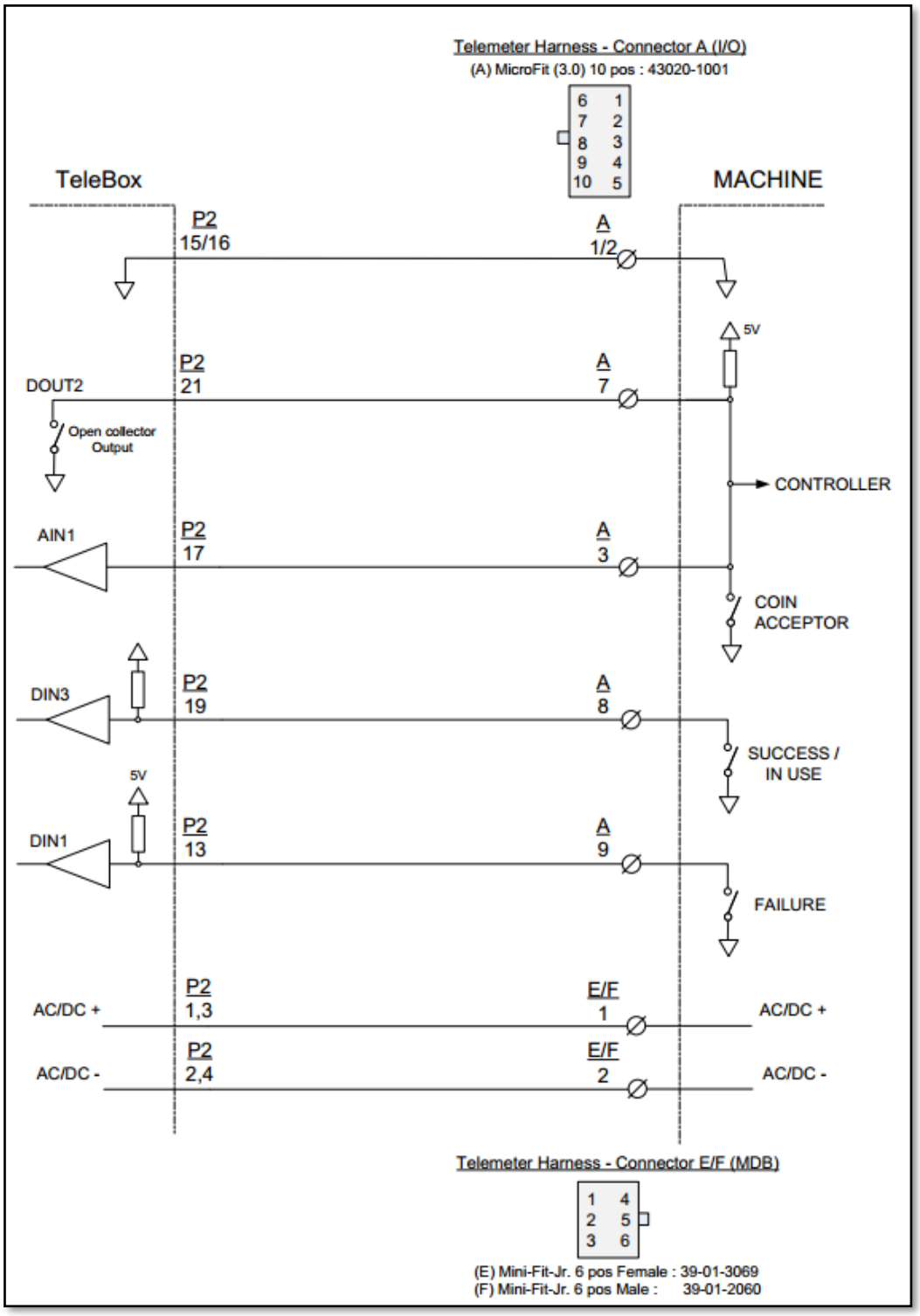


Figure 3– Direct connection chart

Note that the minimal required wire connections are:

Function	TeleBox Pin	Harness Connector &Pin	Comments
GND	P2/15 or 16	I/O: A/1 or A/2	
Cash input	P2/17 (AIN1)	I/O: A/3	Optional, see configuration: PULSE_REGISTER_CASH
Pulse output	P2/21 (DOUT2)	I/O: A/7	
Success / In Use	P2/19	I/O: A/8	Optional, see configuration: PULSE_SUCCESS_FEEDBACK
Failure	P2/13	I/O: A/9	Optional, see configuration: PULSE_FAILURE_FEEDBACK
AC/DC+	P2/1 or P2/3	MDB: E1 or F1	
AC/DC-	P2/2 or P2/4	MDB: E2 or F2	

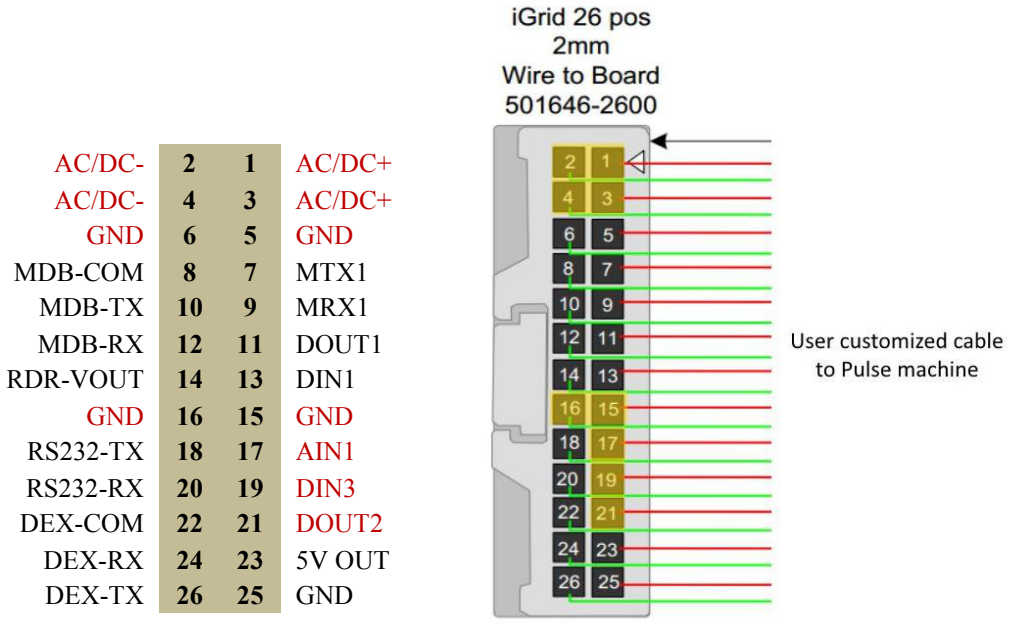


Figure 4 – TeleBox iGrid connector P2 pins

2.2.2 Pulse Interface board connection

When using the Pulse Interface board connection, the TeleBox is connected with a 1:1 cable (provided by OTI) to the Pulse Interface board. The Pulse machine is connected to the interface board J1connector using a customized cable according to the following chart.

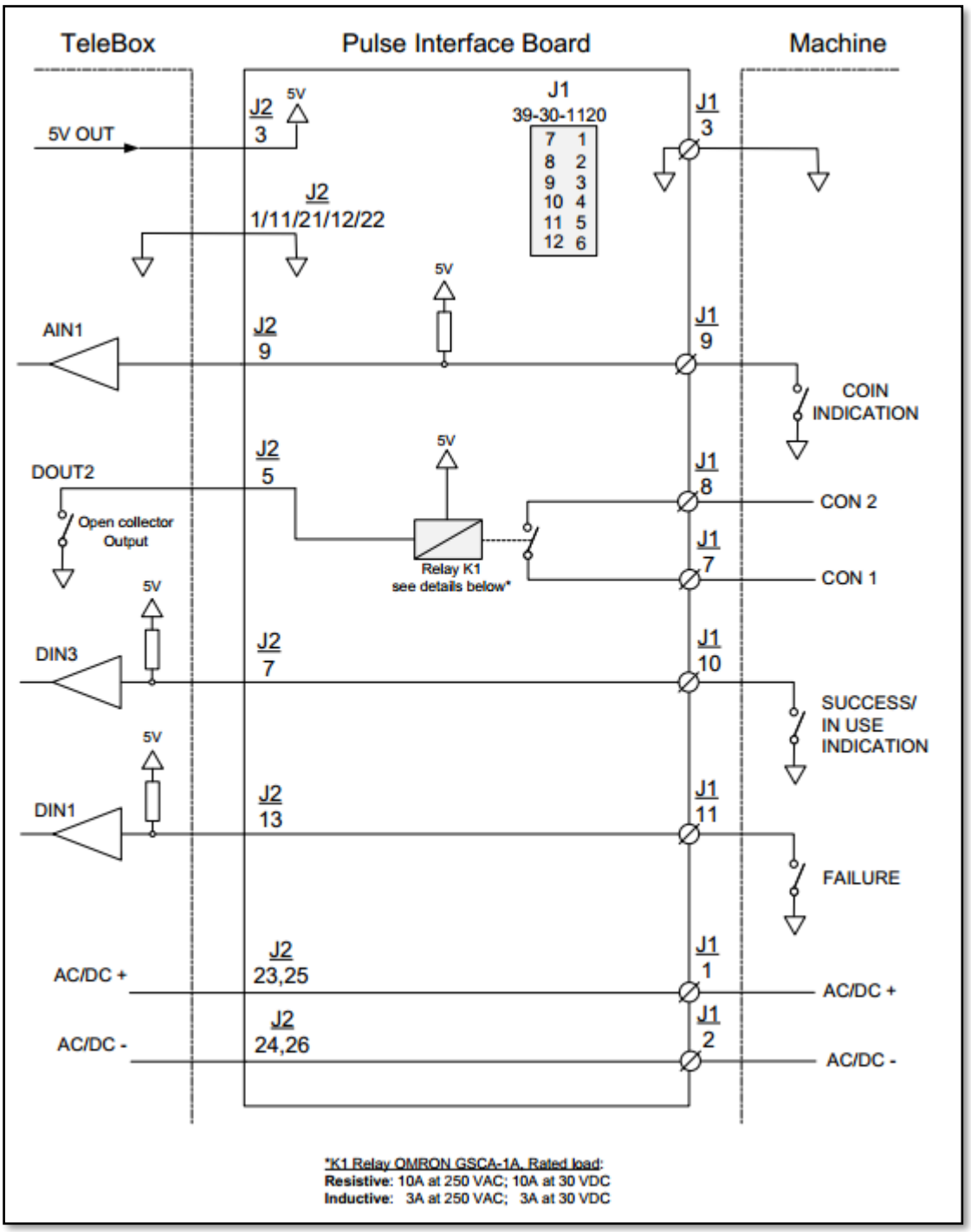


Figure 6 – Pulse Interface board connection schema

CON1	**7**	**1**	AC/DC+
CON2	**8**	**2**	AC/DC-
CASH SIG	**9**	**3**	GND
DIN3	**10**	**4**	+5V
DIN1	**11**	**5**	DOUT1
DIN2	**12**	**6**	DOUT3

Figure 7– J1 connector pins

J3 connector is designed to work with OTI serial readers (Micro-fit 2x4 connector).

In such case, the TeleBox configuration should be set with READER_IS_SERIAL=1

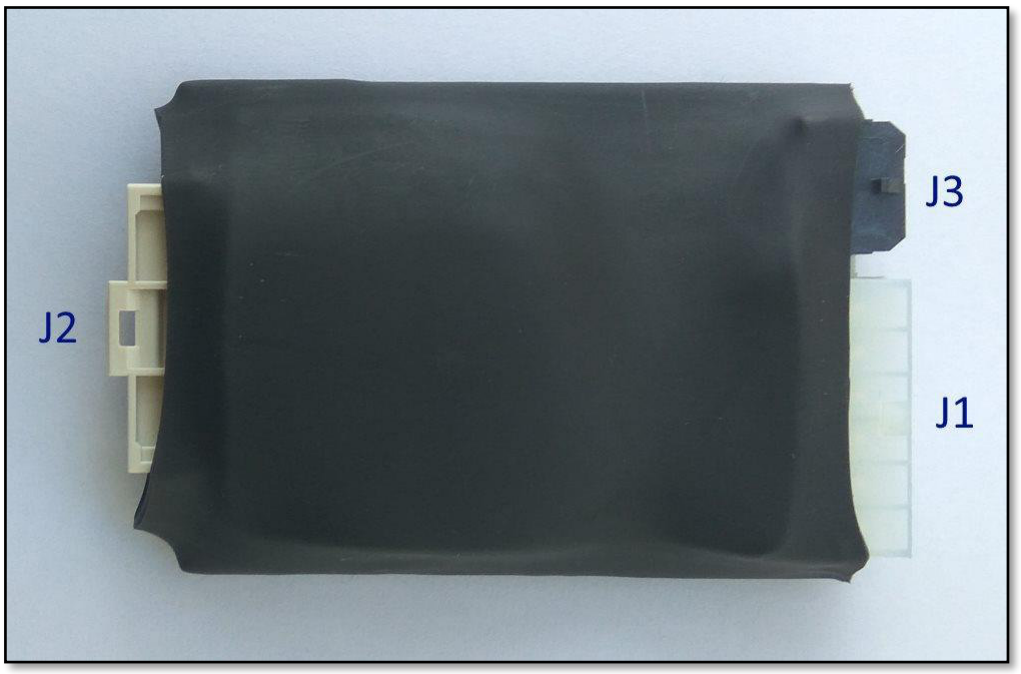


Figure 8 – Pulse Interface board connectors

The Pulse Interface board allows various options for adapting to different types of pulse machines (E.g. adding additional I/Os).

For more details about possible additional options, please contact OTI technical support team.

3 Software functionality

The *OtiPulse* application implements the following functionality:

- The process is initiated when the customer present a payment card to the reader.
- When the reader has processed the payment successfully the TeleBox Digital output (DOUT2) goes from "open" state to "close" state for an adjustable period of time (the "pulse" action).
- **Pulse duration:**
  - The duration of the pulse is highly configurable, from milliseconds, to minutes and even several hours.
  - The duration of the pulse could be short (typically 100 ms.) just to trigger the start of an external system.
  - It could be long, for situations where a logical high needs to be maintained for the entire duration of the external event. (For example: unlocking a door for 10 seconds).
  - The duration of the pulse, is configurable in the TeleBox configuration file.
- **Multi-Pulse& Multi-Price (from Firmware v2.9):**
  - Firmware version 2.9 and above allows settings of multiple prices.
  - The Pulse application allows the user to select the desired price / product:
    - Define reader buttons for up / down navigation

    Example:
    PULSE_NEXT_BUTTON_ID=2
    PULSE_PREV_BUTTON_ID=3
    Note1: Set to 0 to disable "next" or "previous" button.
    Note2: Set “next” to 1 and “prev” to 0 if the reader had only one button. In this case the button will also serve as “cancel” button when payment is in progress.

  - For each price / product, there is one line of configuration to define:
    - Price
    - Display text –2 text strings to show on the 2 lines of the reader display, max 16 characters each
    - Number of pulses
    - Pulse duration (in ms)
    - Interval between pulses (in ms)

    Example:

```
PULSE_PRICE1=100,"30 minutes dry","Price: $1.00",1,500,100
PULSE_PRICE2=200,"45 minutes dry","Price: $2.00",2,500,100
PULSE_PRICE3=300,"60 minutes dry","Price: $3.00",3,500,100
```

  - List selection starts with polling of the first price in the list (PRICE1) and cycle via the rest of the Prices, for example, if the user wants his first price to be the 'middle' one:

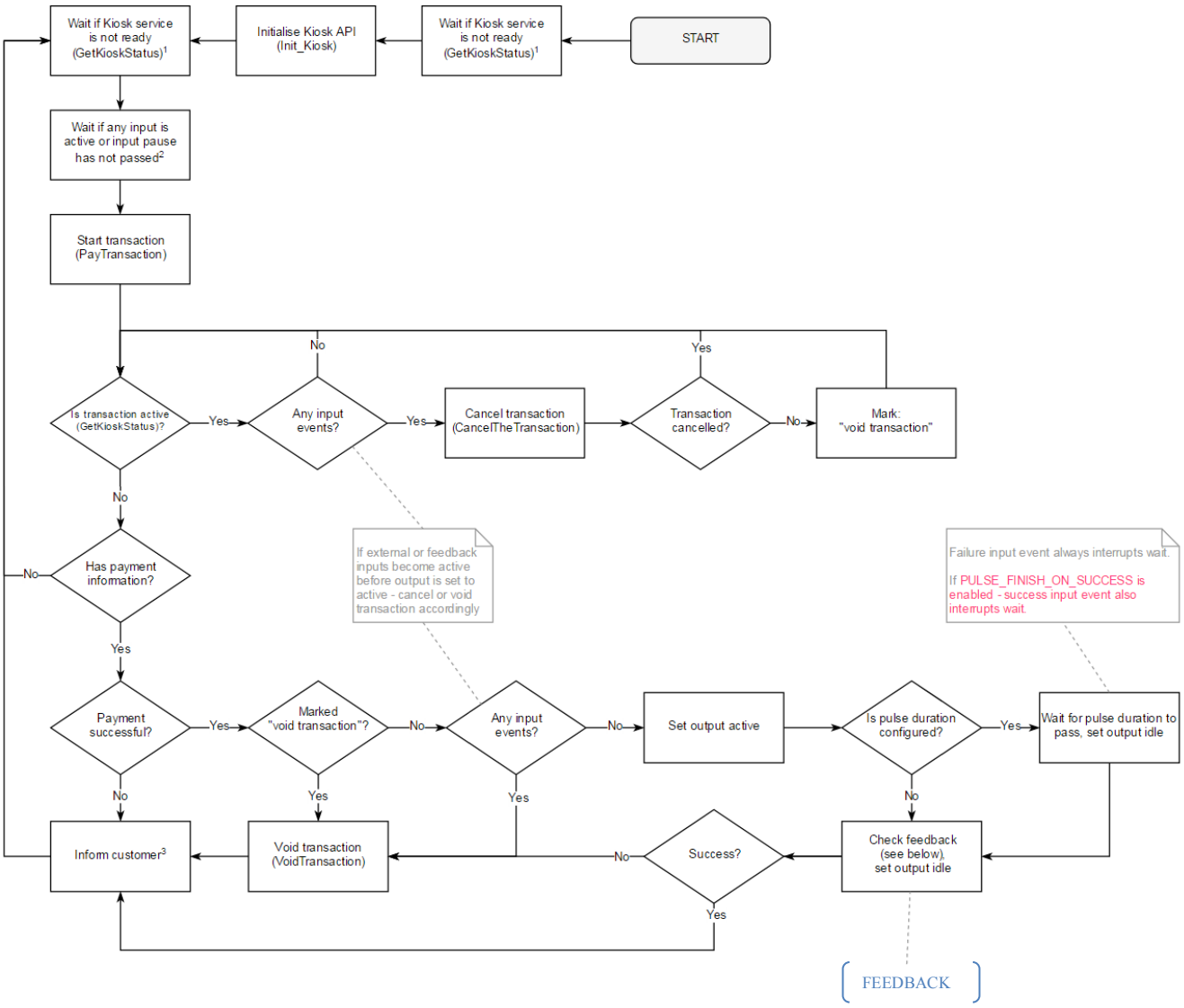
```
PULSE_PRICE1=150,"Price: $1.50","Change with <|>",2,500,100
PULSE_PRICE2=100,"Price: $1.00","Change with <|>",1,300,100
PULSE_PRICE3=300,"Price: $3.00","Change with <|>",4,800,100
```

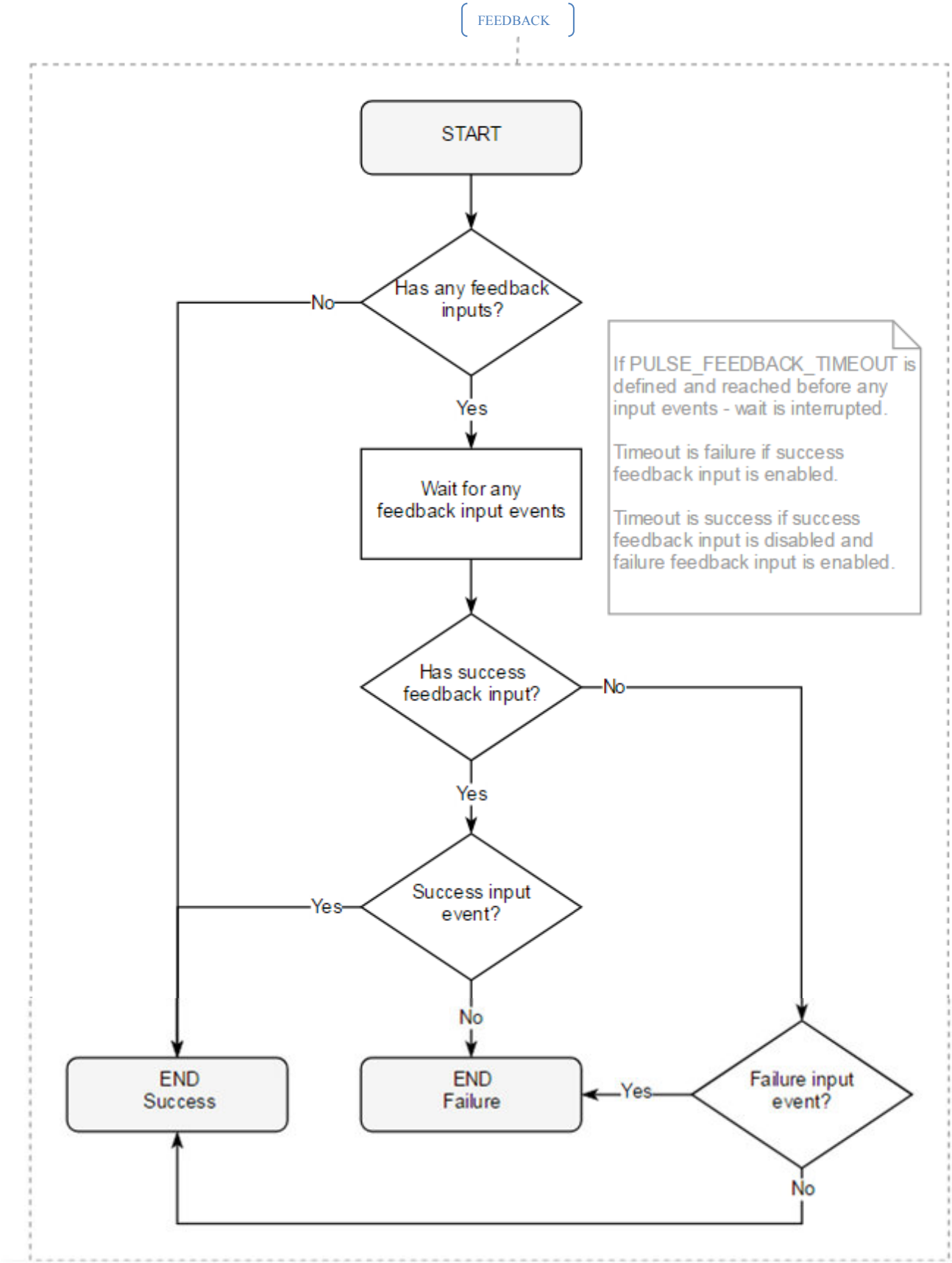
    Spaces are not allowed between parameters (before or after the comma separator).

  - After payment cycle is completed, the application goes back to its 'default' price (PRICE1).
  - **Note**: The new price list structure replaces the previous way of defining price and pulse duration: PULSE_PRICE and PULSE_DURATION (PRICE1 will be used instead in case there is only one price).
    The previous settings will still work for backward compatibility of the configurations.

3.1 Payment flow

Card payment flow for the "otiPulse" application is described by following diagram:




FEEDBACK
START
Has any feedback inputs?
No
Yes
Wait for any feedback input events
If PULSE_FEEDBACK_TIMEOUT is defined and reached before any input events - wait is interrupted.
Timeout is failure if success feedback input is enabled.
Timeout is success if success feedback input is disabled and failure feedback input is enabled.
Has success feedback input?
No
Yes
Success input event?
Yes
No
END Success
END Failure
Yes
Failure input event?
No

5.6 First test

After installation is completed and all the components are connected according to the connection chart shown in **Figure2,** connectthe main power supply to the pulse machine and inspect the 3 red LEDs located on the top of the TeleBox device. The LEDs should turn on, then blink with a circular pattern (one by one) and after few seconds start to provide indication about the different system components:

- **Network** – Blinks when searching for network. Light steady when **connected to the network**.
- **Machine** – Blinks slowly for the first minute and then blinks whenever there is **communication with the pulse machine**.
- **Status** – Blinks whenever there is **reader communication**.

The first connection to the cellular network may take few minutes – during this time the Network LED will blink and the reader will display "WAITNG FOR NETWORK".

In normal operation, after network is connected, the reader should display a message asking the user to pay, according to the amount configured in the TeleBox configuration.

5.6.1 Buttons usage

The 2 buttons are used for technician operations:

- **Software Reset** – press the 2 buttons together for 5 seconds.
- **Hardware reset** – press the hard reset button at the bottom of the TeleBox.
- **Poll test** – press **PB1** shortly, it will send a poll command to the reader with the latest amount configured for transaction.
  Note that this function works only when configured for PAYMENT_TEST_ENABLED=1 and can work even when the Pulse machine is not connected.