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Angaza PAYG Integration

Application Note: Factory Keycode Considerations [AN-TEST-01]

This application note is intended to clarify the functions and use-cases for testing keycodes offered by the Angaza keycode protocol. These keycodes fall under 2 categories:

- Pre-production Design & Development Testing
- Factory & Maintenance Testing

Table of Contents

Pre-Production Design & Development Testing

These development keycodes are designed to be used with the Angaza-provided development board, or on pre-production samples, to perform basic functional testing during the design phase. **These are not intended for use on production units. They will not function on units which have been assigned a PAYG account number, and should never be used on units which will later be assigned one. Doing so may prevent the unit from accepting future keycodes generated by the Hub; the unit may require a firmware reflash before more keycodes can be accepted.**

Credit	Message ID	Development Keycode	Code Description
2 minutes	n/a	***802-941-447-359-16# *OR*** ****951-245-636-101-77#*** [Old: * 576-233-421-923-022-026 #]	2-Minute Demo Code (can be applied multiple times)
10 minutes	n/a	****560-226-019-174-55#*** [Old: * 020-551-348-041-564-918 #]	10-Minute Demo Code (can be applied multiple times)

1 hour	0	***263-776-520-621-03#** [Old: * 811-797-513-614-678-155 #]	Add 1 Hour of PAYG Credit
2 hours	1	***475-014-811-198-18#** [Old: * 184-533-975-514-902-565 #]	Add 2 Hours of PAYG Credit
3 hours	2	***892-512-680-075-50#** [Old: * 818-224-422-932-641-027 #]	Add 3 Hours of PAYG Credit
4 hours	3	***618-442-338-232-85#** [Old: * 453-842-248-414-293-875 #]	Add 4 Hours of PAYG Credit
48 hours	4	***501-899-422-680-58#** [Old: * 547-533-467-923-332-026 #]	Add 2 days of PAYG Credit
72 hours	5	***689-737-671-458-01#** [Old: * 097-688-219-196-837-803 #]	Add 3 days of PAYG Credit
96 hours	6	***977-005-000-099-68#** [Old: * 455-942-329-569-213-960 #]	Add 4 days of PAYG Credit
168 hours	7	***790-995-827-379-72#** [Old: * 635-033-305-114-412-805 #]	Add one week of PAYG Credit
336 hours	8	***680-287-115-791-90#** [Old: * 637-960-209-514-435-565 #]	Add two weeks of PAYG Credit
UNLOCK	10	***854-399-757-785-67#** [Old: * 918-131-137-078-633-811 #]	Permanently PAYG Enable the Development Board (**only a full erase/reflash or wipe can reset the state**)
N/A (Wipe State)	11	***002-996-226-932-99#** [Old: *565-561-337-187-104-902#]	Reset the PAYG state of the product, and erase history of previously received keycodes.

Factory & Maintenance Testing

Pre Account Assignment Testing (Keypad Mechanical Validation)

To test all keys (0-9) on the fully-assembled unit before the AAM, please use the following keycode:

- (Pre-AAM): ***035-471-219-813-96#**

This keycode contains all digits (0-9) and can be entered into pre-AAM units. It will not affect the PAYG state or other functions within the unit, and can be entered multiple times if desired. **If the keycode is accepted (6 blinks on "PAYG COMM"), all keypad keys are confirmed functional.**

Post Account Assignment Testing and QA

PAYG Credit Testing Keycodes

There are two keycodes which can be entered into any unit using '0-9' keycode protocol at any time during production. Before the account assignment step in the factory, all products are PAYG Enabled, so the keycode is not required to enable power output for testing. However, after the account assignment step, these two "Post-AAM" keycodes may be used to enable power output and QA functional testing.

These two keycodes are:

1. SHORT_TEST: ***406-498-3#**
   This keycode will add 1-2 minutes of credit to any unit, **only if the unit is currently PAYG DISABLED**. This code does not add credit to a PAYG_ENABLED unit. Units will accept this keycode a maximum of 255 times over the product lifetime.

2. OQC_TEST: ***577-043-3#**
   This keycode will add 1 hour of credit to any unit, **regardless of the current PAYG state of the unit.** Units will accept this keycode a maximum of 10 times over the product lifetime.

These keycodes may also be used for field testing or demonstration purposes.

PAYG ID Display & Confirmation Keycodes

Certain situations on the production line or in the field may require validation of the PAYG ID provisioned to a particular PAYG MCU. The Coprocessor Keycode Protocol contains two

keycodes for this purpose: one to confirm the MCU is provisioned with a specific known PAYG ID number, and one to 'blink out' the provisioned PAYG ID to the factory worker, distribution agent, technician, or other authorized user.

These keycodes are mainly used to confirm the PAYG ID of products that have been provisioned by the AAM.

1. CONFIRM_PAYG_ID: ***7[8-DIGIT PAYG ID NUMBER]#**
   This code should be used to confirm that the unit in question has been provisioned with a particular PAYG ID. For example, if the unit has a barcode sticker with PAYG ID "43587994", the tester would enter "*743587994#" to check if the PAYG ID on the PAYG MCU matches the one on the sticker.

   If the PAYG ID number provisioned to the unit matches the one entered as the keycode, the PAYG_COMM feedback LED will blink 6 times slowly (identical to the keycode "APPLIED" verification feedback). If the PAYG ID does not match, the LED will blink 3 times slowly (identical to the "DUPLICATE/VALID" keycode feedback).

2. DISPLAY_PAYG_ID: ***6347765#**
   This keycode is used to 'blink out' the full PAYG ID of a unit. When entered, the PAYG_COMM LED will respond in one of three ways:
   a. [Unit After AAM/Provisioning Step] Displays Unit-specific PAYG ID: If the unit has a PAYG ID assigned, then:
      i. The LED will blink rapidly,
      ii. The LED blinks a number of slow blinks equal to the first PAYG ID digit
      iii. The LED will blink rapidly
      iv. The LED will blink a number of slow blinks equal to the next PAYG ID digit
      v. (Steps 3-4 repeat until all digits have been shown)
      vi. The average PAYG ID will take approximately 1 minute to fully blink out
   b. [Unit Before AAM/Provisioning Step, No Keycodes Entered] The LED will blink 3 times slowly (identical to the "DUPLICATE/VALID" KEYCODE FEEDBACK").
   c. [Unit Before AAM/Provisioning Step, Demo Keycode Entered] The LED will blink 6 times slowly (identical to the "APPLIED" verification feedback).