Communication Protocol of Censtar Dispenser in Thailand

Part I General Description

1 Communication Definitions:
9600 BPS, even parity, 8 data bits, 1 stop bit.

2 Data structure for commands:

2.1 synchronization head: 3 Byte. All commands and answers are 3 byte OFCH as synchronization head.
2.2 command: 1 Byte
2.3 Nozzle number: 1 Byte, start from 1.
2.4 Data. The length of data is variable according to various commands.
2.5 Checksum: 1 Byte. Checksum is the XOR value of command, Nozzle number and data.

3 Transaction structure:

3.1 type of transaction:
3.1.1 Normal transaction
3.1.2 Shift start registration transaction
3.2 transaction sequential: all transactions follow sequential access (FIFO).

4 When error of POS or communication occurs, only latest 300 transactions offline can be stored. After error removed, all the transaction offline will be transformed to POS.

Part II Commands

Description and Meanings		Command Item	Data
1. Console send preset to single dispenser		02H	Sale (2+1 BCD) ,Liter (2+1 BCD), Kilogram (2+1 BCD) Unit Price (1+2 BCD), reciprocal of unit price (1+3 BCD), FLAG(1), sequence number(2 BCD), reciprocal of unit price and FLAG can be filled with 0H.
	ANWSER	02H	0BBH: success 0DDH: wrong unit price
2. send unit price to dispenser		03H	Unit price (1+2 BCD), reciprocal of unit price (1+3 BCD),

ANWSER	03H	
3. send density to dispenser if no need kilogram, then no need density.	04H	reciprocal of density (1+2 BCD), density (1+3 BCD)
ANWSER	04H	
4. send “stop” signal to dispenser	05H	inform the dispenser which is being fueling or appointed nozzle to stop immediately. If open mode applicable, then stop this dispenser or nozzle for second fueling till receipt of starting signal (06H).
ANWSER	05H	
5. send “start” signal to dispenser	06H	If monitoring mode, then dispenser or nozzle can fuel one time; if open mode applicable, then remove the “stop” mode.
ANWSER	06H	
6. send mode of monitoring to dispenser	07H	Mode of monitoring (1 HEX, 0AAH: open, 55H: monitor)
ANWSER	07H	
7. read the totalizer of dispenser	08H	Sales Totalizer (3+1BCD), Liters totalizer (3+1BCD), Kilogram totalizer(3+1BCD)
ANWSER	08H	
8. cancel preset	09H	sequence number of preset (2 BCD)
	09H	0BBH: success 0CCH: not allow: fueling/fueling already/invalid
9. read coefficient of flow rate	0EH	
ANWSER	0EH	Coefficient of flow rate (2+1 BCD)
10. read the unit of measurement	10H	Unit of measurement (1 HEX, 0DDH: liter , 0EEH: kilogram)
ANWSER	10H	
11. send date and time to dispenser	12H	YEAR (1 BCD), Month(1 BCD), DAY(1 BCD), Hour(1 BCD),Minute(1 BCD),Second(1 BCD)
ANWSER	12H	
12. console allow dispenser for trial	13H	
ANWSER	13H	
13. stop trial of dispenser	14H	
ANWSER	14H	
14. read the version of dispenser	15H	Version type (1 HEX, 0AAH:Multi products dispenser, 55H: single nozzle dispenser), Version (1+1 BCD)
ANWSER	15H	
15. inform to unlock the dispenser	17H	
ANWSER	17H	

16. sign of lock after sending fueling signal.		31H	Sign of lock (1 HEX, 0AAH: lock after fueling / unlock invalid, 0A0H:lock after fueling /unlock valid, 55H: no lock after fueling), password of unlock outdoors (3 ASCII)
	ANSWER	31H	
17. registration of shift transfer		32H	Staff numbers (2 BCD) 000- no one on duty
	ANWSER	32H	Success
	ANWSER	00H	Not allowed (full transaction in line)
18. send the signal of fueling when no one on duty		33H	Signal (1 HEX, 0AAH: fueling valid, 55H: fueling invalid)
	ANWSER	33H	
19. real data real time on dispenser		34H	
In Fueling	ANSWER (4 Byte)	34H	Volume (2+1BCD)(liter or kilogram), status (1 HEX) Sales amount can be calculated by “Unit price*volume”
When power off	ANSWER (4 Byte)	34H	Volume (2+1BCD)(liter or kilogram), status (1 HEX)
		35H	Sales amount (2+1 BCD), status(1 HEX) After dispenser power off, send sales amount/volume alternately. Status explanation : Bit1～Bit0: 00: stop, unlock 10: stop, lock 01: fueling, preset by non console 11: fueling, preset by console Bit3～Bit2: preset status 00: being volume preset 01: being sales preset 10: being kilogram preset 11: non preset Bit4: 0: without preset by console, 1: preset by console Bit5: 0: no transaction to be read, 1: transaction for reading

When the dispenser is default status, press number key means preset, fill in amount/liter or kilogram according preset type.

When one mainboard to multi-nozzle situation, some of the status is belong to mainboard, for example: locking; some of the status is belong to nozzle, for example: fueling and preset, if one nozzle is presetting when another nozzle is fueling, so the fueling nozzle is priority.

20. read transaction of dispenser		36H	
Transaction available	ANSWER (22Byte)	36H	Sales (2.5 HEX), Liters or kilogram (2.5 HEX)(depend on unit of measurement) Time of transaction (3 BCD: day/hour/minute), reason of transaction (1 HEX), Unit price (1+1BCD)， number of staff (2 BCD), sequence number of transaction (2 BCD), sales totalize (3.5

HEX),liter or kilogram totalize (3.5 HEX)(depend on unit of measurement)

If the reason of transaction is staff duty shift, only fill in transaction time, sales totalizer and staff No.. Normal transaction no need staff no. filled in.

No transaction ANSWER (22 Byte)	38H	Invalid data (22 Byte)
Console ANSWER (only transaction available)	37H	Delete the first transaction in line. No transaction, no ANSWER of console. reason of transaction explanation: compatible with original FLAG Bit1～Bit0: method of preset 00: volume preset 01: sale preset 10: kilogram 11: shift transfer Bit4～Bit2: method of payment 000 trial 001 cash Bit7～Bit5: no need here sequence number of transaction explanation 0-0F9H is the sequence number of console（payment first, fueling second）， 0FAH-0FFH is fueling first, payment second。 staff number explanation no staff number, then input 0H