Automatic DATALOG output feature

Error/Event codes

D'0'	No Error
D'1'	No Credit (CR = 0)
D'2'	Format event due to tag block ID bytes wrong (no match)
D'3'	Not MIFARE1k card
D'4'	Keycode loading error
D'5'	Card communication error
D'6'	Mifare Authentication error (CRYPTO1 error)
D'7'	Format event due to tag block checksum wrong (corruption)
D'8'	EEPROM WRITE error (internal)
D'9'	No card error (not detected by sensor/no RF)
D'10' (0x0A)	RS232 CMD error (unknown CMD or arguments/checksum wrong)
D'11' (0x0B)	Dispense Limit error/event (flow count overflow or max time exceeded)
D'12' (0x0C)	EEPROM write error (external)
D'13' (0x0D)	MFRC chip error
D'14' (0x0E)	Block Read error
D'15' (0x0F)	Block Write error
D'16' (0x10)	NO_FLOW error (typically flow volume < 1 litre after time parameter period)
D'17' (0x11)	PROX event (Magnet detected BUT no tag)
D'18' (0x12)	LOW-BATTERY event (battery voltage < low voltage limit parameter)
D'19' (0x13)	PRESSURE event (change in status of water-pressure micro-switch)
D'20' (0x14)	SuperTap tag/tap TOP-UP complete
D'21' (0x15)	Host VALVE OFF command received and processed (water dispensing terminated)
D'22' (0x16)	START_UP (power-up / reset) event
D'23' (0x17)	NO_FLOW REPEAT error (set if NO_FLOW and tag left in place, cleared by removing tag)
D'24' (0x18)	TAMPER event (change in status of Tamper 1 and / or Tamper 2 switches)
D'25' (0x19)	HEALTH_STATE event (periodic system status report)

The EWC automatically outputs the DATALOG packet in real-time with header, terminator and XOR checksum (after the data is stored in the internal SPI EEPROM). This feature operates separately to the Command/response protocol controlled by the CTS handshaking and occurs after CTS goes HIGH->LOW->HIGH so should not conflict if enabled. No response is expected.

The automatic DATALOG packet is created as 39-bytes of hex data:
<HDR> <EWC_ID0, EWC_ID1, EWC_ID2, EWC_ID3>, < 28-byte DATALOG packet >, <CONVH, CONVL>, <DLPH, DLPL>, ETX, XOR

<HDR> = Datalog packet header code = ASCII "D", 0x44
<EWC_ID0 – 3> is the 4-byte EWC_ID (MSB first),
<28-byte DATALOG packet> = see below
<CONVH, CONVL> = Litre / Credit conversion parameter (0 – 65535 as MSB, LSB hex bytes)
<DLPH, DLPL> = Datalog pointer (0 – 8190 as HIGH, LOW hex bytes). This the storage pointer for the data in the storage EEPROM.
Wraps around to 00 00 when EEPROM is full and DLP = 1F FE (8190 dec) (Note EWC2, 1022 max)
<ETX> = 0x03 end of sequence byte
<XOR> = 8-bit XOR of all bytes up to and including ETX.

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< 28-byte DATALOG packet >

EE	SS	MM	HH	DD	MT	YY	UU	UU	UU	UU	AN	RS	UC	UC	SCR	SCR	SCR	SCR	ECR	ECR	ECR	ECR	FC	FC	FC	FT	FT
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

Where EE = Error/Event code
SS MM HH = Seconds, Minutes, Hours bytes (BCD), DD MT YY = Day, Month, Year bytes (BCD)
UU UU UU UU is the 4-byte card UID (MSB -> LSB)
AN = Battery voltage ADC value (calibration: voltage = ADC value/256 x 15, for example 12v = 0xCC)
RS = Reserved for particular data depending on the specific error/event (default 0x00).
UC UC is the 2-byte usage counter
SCR SCR SCR SCR is the 4-byte start Credit value (MSB -> LSB) stored as MITs (MilliCredits)
ECR ECR ECR ECR is the 4-byte end Credit value
FC FC FC is the 3-byte (MSB, MID, LSB) Flow meter count (flow volume). Litres ~= FC / 360
FT FT is the 2-byte (MSB, LSB) Flow time (seconds)

This 39-byte hex data packet is transmitted to the host automatically after a "water dispensing" event. No response is expected. The host system will have to check the Command header code, the length of the data, the ETX terminator and the XOR is correct before the various data fields are extracted.

Examples of the 39-byte auto datalog transmission are:

44 00 00 00 01 09 25 04 12 01 01 15 F5 7E 43 26 CC 00 00 03 00 00 1F 3E 00 00 1F 37 00 08 C5 00 0A 01 4A 00 30 03 31

Broken down as (Hex bytes grouped into data fields):
<44> < 00 00 00 01> < 09> < 25 04 12> < 01 01 15> < F5 7E 43 26> <CC> <00> <00 03> < 00 00 1F 3E> <00 00 1F 37> < 00 08 C5> < 00 0A> < 01 4A> <00 30> < 03> < 31>
In this case the error/event code is 0x09 = no card (tag removed)

When a pure magnet is presented (no RFID), the "PROX event" packet has following typical format:
44 00000001 11 220612 010115 00000000 CC000000 00000000 00000000 000000 0000 014A 0036 03 09

The 0x11 (17 dec) error/event code shows the "Prox event"
Occasionally, if a magnet is slid into place and the tag is pushed out quickly while water is being dispensed then the Prox event will terminate the water dispensing session and the packet will contain data similar to below.

44 00000001 11 110512 010115 F55F63A3 CC000006 00001ED2 FFFFFFFF 000000 0001 014A 0033 03 9D
Note, the FFFFFFFF end credit field indicates that the credit has NOT been written to the tag.

"SUPERTAP" feature and command/response protocol

The SuperTap feature has two modes of operation, TAG and TAP top-up:

1) The EWC can "top-up" or write credit to 25 x user TAGS (using LOAD and CLEAR SuperTap table commands to manage PIC EEPROM list of 25 x UID + TOP-UP values).

2) The EWC can use HOST VALVE-ON/OFF command to transfer credit to the tap (without tag) and operate remotely. Subsequent TAP TOP-UP + CREDIT commands can "top-up" the credit on the TAP. This allows tap to be used remotely for "in-house" applications.

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