INT-KLCD serial port data format (for INTEGRA 24/32/64/128/128-WRL/256 v1.16 2016-06-14 or newer) *

Tab. 1 Data-frame format for writing to serial port in INT-KLCD keypad

d1	d2	...	dn	crc

d1...dn   - command data described in Tab. 2
   crc   - additional sum modulo 256 of data-frame bytes: crc = byte(d1 + d2 + ... + dn)
Description:
- receiving algorithm in INT-KLCD is not time-dependant
- to perform synchronization of INT-KLCD (i.e. to put it into base state, to make it waiting for d1) at least two bytes 0xFF have to be sent. Two successive 0xFF bytes sent in any time mean synchronization
- to send 0xFF value as d2 or d3 or ... or dn or crc, two bytes should be sent: 0xFF followed by 0x00
- d1 can not be 0xFF (synchronization issue)
- two bytes should be sent after the crc: 0xFF followed by 0xAA, what means that the frame is completed
- in new INT-KLCD keypads it may be necessary to send at least 3 frames to activate the described protocol

Tab. 2 Data for writing to INT-KLCD serial port

d1	action	rest of data (d2, ..., dn) description
0x70	arm	8 bytes - code (with prefix, if entered) filled with 'A's, 4 bytes - partitions to arm, 1 byte - arming mode. Its value can be only 0, 1, 2 or 3: 0 - full arm 1 - full arm with bypasses (zones with "Bypass if no exit" option) 2 - arm without internal zones 3 - arm without internal zones and without entry time 1 byte - crc = xor of d1...d(n-1), i.e.: 0x70 xor 8 bytes xor 4 bytes xor 1 byte E.g.: to arm partition 31 with '12345' code in arming mode 1 the following frame should be sent: 0xFF, 0xFF, 0x70, 0x12, 0x34, 0x5A, 0xAA, 0xAA, 0xAA, 0xAA, 0xAA, 0x00, 0x00, 0x00, 0x40, 0x01, 0xE7, 0x8A, 0xFF, 0xAA, where: 0xE7 = 0x70 xor 0x12 xor ... xor 0x40 xor 0x01 0x8A = (0x70 + 0x12 + ... + 0x01 + 0xE7) and 0x00FF - i.e. 8 low bits of the sum
0x71	disarm	similar to arm, but without the byte 'arming mode'
0x72	clear alarm	similar to disarm
0x73	bypass	8 bytes - code (with prefix, if entered) filled with 'A's, 16 bytes - zones to bypass, 1 byte - crc = xor of d1...d(n-1), i.e.: 0x73, 8 bytes and 16 bytes. See egzample for arm
0x74	unbypass	similar to bypass
0x75	outputs on	similar to bypass
0x76	outputs off	similar to bypass
0x77	troubles	8 bytes - code (with prefix, if entered) filled with 'A's, 1 byte - crc = xor of d1...d(n-1), i.e.: 0x77 and 8 bytes See egzample for arm

Note: the crc sum in Tab. 1 is the main check sum. The sum in Tab. 2 is the second check sum.
The results of actions in Tab. 2 can be observed by scanning the data described in Tab. 4.
The result of troubles is returned once after the command is sent, see Tab. 4 and Tab. 5 for details.

Tab. 3 Data-frame format for reading from serial port of INT-KLCD keypad

0xQQ	...	0xQQ	co	d1	d2	...	dn	crc

 0xQQ   - inter-frame byte 0xFF or 0xFE, occurs at least once, but can occur more times
    co   - command (see the description in Tab. 4). The command can not be 0xFF nor 0xFE (synchronization issue)
    d?   - data for the command (in Tab. 4 the number of bytes for each command is denoted by 'n')
   crc   - sum modulo 256 of data-frame bytes: crc = byte(0xQQ + co + d1 + d2 + ... + dn)
      in this sum only one 0xQQ byte takes place, the one directly before 'co'
If number of bytes ('n') for a command does not match the specification in Tab. 4, it is other command that is not described in this document. Drop out such data.

*   Data for reading from or writing to INT-KLCD serial port at 4800/8/1/N. The same protocol can be used to communicate via CA-64 PTSA.

New format for writing data to serial port in INT-KLCD keypad

0xFF	0xFF	d1	d2	...	dn	crc1	crc2	crc3	crc4	0xFF	0x99

d1...dn   - command data described in Tab. 2

Description:
- max. data length is n=39
- the 16-bit crc1.crc2 sum is calculated as follows:
    - set crc1.crc2 = 0x13B7 (i.e. crc1 = 0x13, crc2 = 0xB7)
    - for all successive bytes b = d1, d2, ..., dn perform the following update steps:
        - crc1.crc2 = crc1.crc2 + b (if crc1.crc2=0xFEDC, b=0xA9 then: 0xFEDC + 0xA9 = 0xFF85)
        - crc1.crc2 = rl(crc1.crc2) - rotate crc1.crc2 1 bit left (msb=bit.15 shifts into lsb=bit.0 position)
- the 8-bit crc3 sum is calculated as follows:
    - set crc3 = 0x3D
    - for all successive bytes b = d1, d2, ..., dn, crc1, crc2 perform the following update steps:
        - crc3 = crc3 + b
        - crc3 = swap(crc3) - bits crc3.7654 are awapped with bits crc3.3210
- the 8-bit crc4 sum is calculated as follows:
    - set crc4 = 0x4D
    - for all successive bytes b = d1, d2, ..., dn, crc1, crc2, crc3 perform the following update step:
        - crc4 = crc4 + b
- the format has no time-dependant relations (the previous version also has not)
- to perform synchronization of INT-KLCD (i.e. to put it into base state, to make it waiting for d1) at least two bytes 0xFF have to be sent. Two successive 0xFF bytes sent in any time mean synchronization. In synchronization state next 0xFF byte does not change the state - it is still synchronization state
- to send 0xFF value as d2 or d3 or ... or dn or crc?, two bytes should be sent: 0xFF followed by 0x00
- two bytes: 0xFF, 0x99 mean end of frame
- from synchronization issue it appears that d1 can not be 0xFF
- it may be necessary to send at least 3 frames to activate this protocol. Precisely, sending succesive 3 old or 3 new frames switches the format in INT-KLCD

New format for reading data from serial port in INT-KLCD keypad

The format for reading is the same as the above format for writing to INT-KLCD except for two differences:
- INT-KLCD does not end frame with 0xFF, 0x99 (i.e. synchronization bytes 0xFF, 0xFF mean end of the current frame and begin of the next one)
- after data from INTEGRA and before crc1 INT-KLCD sends one additional byte indicating the INT-KLCD state:
    - .7 - 0 = RS buffer is empty, 1 = RS buffer is not empty
    - .6543210 - frame number, each next frame has this field increased by 1

Note: in new format INT-KLCD sends two bytes: 0xFF, 0x00 instead of one 0xFF if this value (0xFF) is to send as d2 or d3 or ... or dn or crc?. This implies that 0xFF, 0xFF sequence can not appear inside frame - it can occur only for/in synchronization.

The new format is more robust then the old one (in Tab. 1 and 2) - more check sums, and has clearly separated frames - two succesive 0xFF, 0xFF bytes mean end of the current frame and begin of the next one.

The new format is available in keypads:

INT-KLCDK v6.03 2006-06-13 or newer
INT-KLCDL v6.03 2006-06-13 or newer
INT-KLCDS v6.03 2006-06-13 or newer
INT-KLCDR v1.04 2006-06-23 or newer

Older keypads serve only the old format.

Tab. 4 Data for reading from INT-KLCD serial port

co	n	description
0x00	4 / 5 / 8 *,**	zones 1..32 / 65..96 / 129..192 violation
0x01	4 / 5 / 8 *,**	zones 33..64 / 97..128 / 193..256 violation
0x02	4 / 5 / 8 *,**	zones 1..32 / 65..96 / 129..192 tamper
0x03	4 / 5 / 8 *,**	zones 33..64 / 97..128 / 193..256 tamper
0x04	4 / 5 / 8 *,**	zones 1..32 / 65..96 / 129..192 alarm
0x05	4 / 5 / 8 *,**	zones 33..64 / 97..128 / 193..256 alarm
0x06	4 / 5 / 8 *,**	zones 1..32 / 65..96 / 129..192 tamper alarm
0x07	4 / 5 / 8 *,**	zones 33..64 / 97..128 / 193..256 tamper alarm
0x08	4 / 5 / 8 *,**	zones 1..32 / 65..96 / 129..192 alarm memory
0x09	4 / 5 / 8 *,**	zones 33..64 / 97..128 / 193..256 alarm memory
0x0A	4 / 5 / 8 *,**	zones 1..32 / 65..96 / 129..192 tamper alarm memory
0x0B	4 / 5 / 8 *,**	zones 33..64 / 97..128 / 193..256 tamper alarm memory
0x0C	4 / 5 / 8 *,**	zones 1..32 / 65..96 / 129..192 bypasses
0x0D	4 / 5 / 8 *,**	zones 33..64 / 97..128 / 193..256 bypasses
0x0E	4 / 5 / 8 *,**	zones 1..32 / 65..96 / 129..192 'no violation' trouble
0x0F	4 / 5 / 8 *,**	zones 33..64 / 97..128 / 193..256 'no violation' trouble
0x10	4 / 5 / 8 *,**	zones 1..32 / 65..96 / 129..192 'long violation' trouble
0x11	4 / 5 / 8 *,**	zones 33..64 / 97..128 / 193..256 'long violation' trouble
0x12	4 / 5 *	armed partitions (with suppressed status) / really armed partitions (without suppressed status) ***
0x13	4 / 5 *	partitions with entry time / partitions temporary blocked (partitions type 1)
0x14	4 / 5 *	partitions with exit time >10sec. / partitions blocked for guard round
0x15	4 / 5 *	partitions with exit time <10sec. / partitions with arming mode 2
0x16	4 / 5 *	partitions with alarm / partitions with arming mode 3
0x17	4	partitions with fire alarm
0x18	4 / 5	partitions with alarm memory / partitions with verified alarm memory
0x19	4	partitions with fire alarm memory
0x1A	4	partitions with 1st code entered
0x1B	7	time - ss,mm,hh,dd,mm,yy,tt: ss - seconds BCD (00..59) mm - minutes BCD (00..59) hh - hours BCD (00..23) dd - day of month BCD (01..31) mm - month BCD (01..12) yy - 2 last digits of the year BCD (00..99) tt - bit.7 - service mode bit.6 - trouble tt - bits.210 - day of the week (0-Mon., ..., 6-Sun)
0x1C	?	0x00 + 3 bytes - outputs 1..24 state in INTEGRA 24 0x00 + 4 bytes - outputs 1..32 state in INTEGRA 32 0x00 + 8 bytes - outputs 1..64 state in INTEGRA 64 0x00 + 16 bytes - outputs 1..128 state in INTEGRA 128, 128-WRL and 256 0x01 + 8 bytes - opened (4 bytes) and long opened (4 bytes) doors - INTEGRA 24, 32 and 128-WRL 0x01 + 16 bytes - opened (8 bytes) and long opened (8 bytes) doors - INTEGRA 64, 128 and 256 0x02 + 16 bytes - outputs 129..256 state in INTEGRA 256

*   If data contains 5 bytes, the first 4 bytes are valid data. The 5th byte is addictional byte to distinguish the meaning of the frame (it is check sum calculated as xor function of the 'co' byte and the first 4 data bytes, e.g. the following frame can occur: 0x0A, 0x01, 0x20, 0x07, 0x09, 0x25, where 0x0A - zones 65..96 tamper alarm memory, 0x01, 0x20, 0x07, 0x09 - list of zones - zone 65, 78, 81, 82, 83, 89, 92, 0x25 - crc = 0x0A xor 0x01 xor 0x20 xor 0x07 xor 0x09).

**   Data with 5 bytes can occur only in INTEGRA 128, 128-WRL and 256. Data with 8 bytes can occur only in INTEGRA 256.

*** If suppression arm status time is set to 0 in INTEGRA (i.e. there is no arm status suppression), only the 4 data bytes will be present, and the variant with 5 data bytes will not be present.

Tab. 5 Data for reading from INT-KLCD serial port - troubles

co	n	description	comment
0x50	46	15 bytes - radio devices with low battery in last 15 ACU expanders 15 bytes - radio devices with no communication in last 15 ACU expanders 15 bytes - radio outputs with no communication in last 15 ACU expanders 1 byte - sum mod 256 of 0x50 and 45 bytes	only if ACU is present only in INTEGRA 256
0x51	46	45 bytes - trouble memory of 0x50 1 byte - sum mod 256 of 0x51 and 45 bytes	only if ACU is present only in INTEGRA 256
0x52	48	16 bytes - troubles of zones 129..256 16 bytes - memory of zones 129..256 troubles 15 bytes - jam level of last 15 ACU expanders 1 byte - sum mod 256 of 0x52 and 47 bytes	only in INTEGRA 256
0x53	49	16 bytes - memory of zones 129..256 long violation 16 bytes - memory of zones 129..256 no violation 16 bytes - memory of zones 129..256 tamper 1 byte - sum mod 256 of 0x53 and 48 bytes	only in INTEGRA 256
0x54	48	16 bytes - troubles of zones 8 bytes - AC troubles in expanders 8 bytes - BATT troubles in expanders 8 bytes - NO BATT troubles in expanders 3 bytes - system troubles (see Tab. 6) 1 byte - AC troubles in CA-64 PTSA 1 byte - BATT troubles in CA-64 PTSA 1 byte - NO BATT troubles in CA-64 PTSA 1 byte - monitoring troubles in ETHM-1 1 byte - sum mod 256 of 0x54 and 47 bytes	
0x57	27	8 bytes - troubles of head A of proximity card readers 8 bytes - troubles of head B of proximity card readers 8 bytes - overload of expanders supply outputs 2 bytes - addressable zone expanders short circut or jammed ACU modules 1 byte - sum mod 256 of 0x57 and 26 bytes	
0x58	61	15 bytes - jam level of ACU modules 15 bytes - radio devices with low battery 15 bytes - radio devices with no communication 15 bytes - radio outputs with no communication 1 byte - sum mod 256 of 0x58 and 56 bytes	only if ACU is present
0x59	31	8 bytes - expanders with no communication 8 bytes - switcherooed expanders 1 byte - LCD keypads with no communication 1 byte - switcherooed LCD keypads 1 byte - ETHM-1 modules with no network cable 8 bytes - expanders tamper 1 byte - LCD keypads tamper 1 byte - LCD keypad initiation errors 1 byte - STM uP troubles INTEGRA 128-WRL, 64 PLUS, 128 PLUS, 256 PLUS, 0x00 for others 1 byte - sum mod 256 of 0x59 and 29 bytes	
0x5A	48	47 bytes - trouble memory of 0x54 1 byte - sum mod 256 of 0x5A and 47 bytes	
0x5B	40	26 bytes - trouble memory of 0x57 1 byte - LCD keypads restart memory 8 bytes - expanders restart memory 2 bytes - GSM trouble code (high,low) 2 bytes - GSM trouble code memory (high,low) 1 byte - sum mod 256 of 0x5B and 39 bytes	
0x5C	61	60 bytes - trouble memory of 0x58 (in this the first 15 bytes is equal 0) 1 byte - sum mod 256 of 0x5C and 56 bytes	only if ACU is present
0x5D	31	30 bytes - trouble memory of 0x59 1 byte - sum mod 256 of 0x5D and 29 bytes	
0x5E	49	16 bytes - memory of zones long violation 16 bytes - memory of zones no violation 16 bytes - memory of zones tamper 1 byte - sum mod 256 of 0x5E and 48 bytes	
0x5F	32	1 byte - low battery in masters key fobs 30 bytes - low battery in users key fobs 1 byte - sum mod 256 of 0x5F and 31 bytes	only if ACU or INT-RX is present

Note: after the 0x77 request sent to INTEGRA (see Tab. 2) only one trouble of those described in Tab. 5 is returned.
Note: INTEGRA does not send the 0x51, 0x53, 0x5A, 0x5B, 0x5C, 0x5D and 0x5E commands if trouble memory option is inactive.

Tab. 6 System troubles definition (3 bytes)

byte offset.bit number	description
0.0	OUT1 trouble
0.1	OUT2 trouble
0.2	OUT3 trouble
0.3	OUT4 trouble
0.4	+KPD trouble
0.5	+EX1 or +EX2 trouble
0.6	BATT trouble
0.7	AC trouble
1.0	DT1 trouble
1.1	DT2 trouble
1.2	DTM trouble
1.3	RTC trouble
1.4	no DTR signal
1.5	no BATT present
1.6	external modem initialization trouble
1.7	external model command (ATE0V1Q0H0S0=0) trouble
2.0	no voltage on telephone line
2.1	bad signal on telephone line
2.2	no signal on telephone line
2.3	monitoring to station 1 trouble
2.4	monitoring to station 2 trouble
2.5	EEPROM or access to RTC trouble
2.6	RAM memory trouble
2.7	main panel restart memory

Reading events

To read events the following command can be used:
`0x79 0x03 0xFA n1 n2 n3 crc`
The bytes above are d1..dn bytes to send as described in Tab. 1 (the crc above and the crc in Tab. 1 are two diffenent check sums).
The crc above = 0x79 xor 0x03 xor 0xFA xor n1 xor n2 xor n3.
The n1.n2.n3 bytes are the event index - the returned event is the previous to n1.n2.n3 event.
To start reading events (i.e. to read the last event) the data above should be send with n1.n2.n3 = 0xFF, 0xFF, 0xFF.
The answer is as follows:
`0x1B 0xFA e1 e2 e3 e4 e5 e6 e7 e8 i1 i2 i3 n1 n2 n3 crc`
The bytes above are co,d1..dn bytes as described in Tab. 3 (the crc above and the crc in Tab. 3 are two diffenent check sums).
The crc above = byte(0x1B + 0xFA + e1 + e2 + e3 + e4 + e5 + e6 + e7 + e8 + i1 + i2 + i3 + n1 + n2 + n3).
The n1.n2.n3 bytes are copied from question (0x79) and i1.i2.i3 are index of the returned e1.e2.e3.e4.e5.e6.e7.e8 event record.
To read the successive previous event send 0x79 command with n1.n2.n3 = i1.i2.i3 returned in 0x1B answer.

Description of event record:

Bit:	.7	.6	.5	.4	.3	.2	.1	.0
e1	Y	Y	Z	E	S2	S2	S1	S1
e2	K	K	K	D	D	D	D	D
e3	M	M	M	M	T	T	T	T
e4	t	t	t	t	t	t	t	t
e5	P	P	P	P	P	R	C	C
e6	c	c	c	c	c	c	c	c
e7	n	n	n	n	n	n	n	n
e8	S	S	S	u	u	u	u	u

YY	- year marker (i.e. YEAR mod 4, e.g. 2013 mod 4 = 1, 2014 mod 4 = 2)
Z	- 1 = record not empty
E	- 1 = event present (normally ZE should be both 00 or 11)
S1, S2	- status of monitoring to station 1 and 2, respectively:

           00 - new event, not processed by monitoring service
           01 - event sent
           10 - should not occur
           11 - event not monitored

KKK	- event class:	000 - zone and tamper alarms
		001 - partition and expander alarms
		010 - arming, disarming, alarm clearing
		011 - zone bypasses and unbypasses
		100 - access control
		101 - troubles
		110 - user functions
		111 - system events

DDDDD	- day of the month (1..31)
MMMM	- month (1..12)
TTTTtttttttt	- time in minutes (e.g. 17:53 = 17*60+53 = 1073)
PPPPP	- partition number
R	- 1 = restore
CCccccccccc	- event code
nnnnnnnn	- source number (e.g. zone number, user number)
SSS	- object number (0..7)
uuuuu	- user control number - this number is increased everytime the user is created (i.e. it will be changed after erase and create the user). This number is important only in those events which have the user in its description (e.g. arming by user; but e.g. zone alarm - not)

Full event list that is possible to generate by INTEGRA v1.16 2016-06-14 (older INTEGRA can generate subset of these events):
- the first column is the event code (CCccccccccc)
- the second column is new/restore (R)
- the third column is kind of long description
- the fourth column is event text description

see next pages:

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 1,0, 6,'Voice messaging aborted                '
 2,0, 3,'Change of user access code             '
 2,1, 3,'Change of user access code             '
 3,0, 6,'Change of user access code             '
 4,0, 6,'Zones bypasses                         '
 5,0, 6,'Zones reset                            '
 6,0, 6,'Change of options                      '
 7,0, 6,'Permission for service access          '
 7,1, 6,'Permission for service access removed  '
 8,0, 6,'Addition of user                       '
 9,0, 6,'New user                               '
10,0, 6,'Edition of user                        '
11,0, 6,'User changed                           '
12,0, 6,'Removal of user                        '
13,0, 6,'User removed                           '
14,0, 6,'Breaking user code                     '
15,0, 6,'User access code broken                '
16,0, 6,'Addition of master                     '
17,0, 6,'Edition of master                      '
18,0, 6,'Removal of master                      '
19,0, 4,'RS-downloading started                 '
19,1, 4,'RS-downloading finished                '
20,0, 6,'TEL-downloading started                '
21,0, 6,'Monitoring station 1A test             '
22,0, 6,'Monitoring station 1B test             '
23,0, 6,'Monitoring station 2A test             '
24,0, 6,'Monitoring station 2B test             '
26,0, 2,'Access to cash machine granted         '
27,0, 3,'Breaking user code                     '
27,1, 3,'Breaking user code                     '
28,0, 3,'User access code broken                '
28,1, 3,'User access code broken                '
29,0, 7,'Automatically removed temporal user    '
30,0, 0,'Service access automatically blocked   '
31,0, 0,'Main panel firmware updated            '
32,0, 4,'System settings stored in FLASH memory '
33,0, 0,'STARTER started                        '
34,0, 0,'STARTER started from RESET jumper      '
36,0, 7,'Removal of single user                 '
37,0, 2,'First access code entered              '
38,0, 3,'Voice messaging aborted                '
38,1, 3,'Voice messaging aborted                '
39,0, 1,'Vibration sensors test ok              '
40,0, 6,'Change of prefix                       '
41,0, 0,'Change of winter time to summer time   '
42,0, 0,'Change of summer time to winter time   '
43,0, 6,'Guard round                            '
44,0, 5,'First access code expired              '
45,0, 2,'First access code cancelled            '
46,0, 7,'Remote (telephone) control started     '
46,1, 7,'Remote (telephone) control finished    '
47,0,10,'Remote switch turned on                '
47,1,10,'Remote switch turned off               '
48,0,30,'TCP/IP connection started (Internet)   '
48,1,30,'TCP/IP connection finished (Internet)  '
49,0,30,'TCP/IP connection failed (Internet)    '
50,0,31,'IP address                             '
51,0, 4,'Invalidation of system settings in FLASH '
52,0, 6,'Service note cleared                   '
53,0, 1,'Vibration sensors test interrupted     '
54,0,30,'TCP/IP connection started (DLOADX)     '
54,1,30,'TCP/IP connection finished (DLOADX)    '
55,0,30,'TCP/IP connection failed (DLOADX)      '
56,0,30,'TCP/IP connection started (GUARDX)     '
56,1,30,'TCP/IP connection finished (GUARDX)    '
57,0,30,'TCP/IP connection failed (GUARDX)      '
58,0,30,'TCP/IP connection started (GSM socket) '
58,1,30,'TCP/IP connection finished (GSM socket)'
59,0,30,'TCP/IP connection failed (GSM socket)  '
60,0,30,'TCP/IP connection started (GSM http)   '
60,1,30,'TCP/IP connection finished (GSM http)  '
61,0,30,'TCP/IP connection failed (GSM http)    '
62,0, 6,'User access                            '
63,0, 6,'User exit                              '
64,0, 4,'Keypad temporary blocked               '
65,0, 4,'Reader temporary blocked               '
66,0, 1,'Arming in "Stay" mode                  '
67,0, 1,'Armin in "Stay, delay=0" mode          '
68,0, 0,'System real-time clock set             '
69,0, 6,'Troubles memory cleared                '
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 70,0, 6,'User logged in                              '
 71,0, 6,'User logged out                             '
 72,0, 6,'Door opened from LCD keypad                 '
 73,0,13,'Door opened                                 '
 74,0, 6,'System restored                             '
 75,0, 0,'ETHM/GPRS key changed                       '
 76,0, 6,'Messaging test started                      '
 77,0, 1,'Alarm monitoring delay                      '
 78,0, 4,'Network cable unplugged                     '
 78,1, 4,'Network cable ok                            '
 79,0, 9,'Messaging trouble                           '
 80,0, 9,'Messaging doubtful                          '
 81,0, 9,'Messaging ok                                '
 82,0, 9,'Messaging confirmed                         '
 83,0, 1,'3 wrong access codes                        '
 84,0, 1,'Alarm - proximity card reader tamper        '
 84,1, 1,'Proximity card reader restore               '
 85,0, 4,'Unauthorised door opening                   '
 86,0, 3,'User exit                                   '
 86,1, 3,'User exit                                   '
 87,0, 2,'Partition temporary blocked                 '
 88,0, 0,'GSM module trouble                          '
 88,1, 0,'GSM module ok                               '
 89,0, 4,'Long opened door                            '
 89,1, 4,'Long opened door closed                     '
 90,0, 0,'Downloading suspended                       '
 91,0, 0,'Downloading started                         '
 92,0, 1,'Alarm - module tamper (verification error)  '
 92,1, 1,'Module tamper restore (verification ok)     '
 93,0, 1,'Alarm - module tamper (lack of presence)    '
 93,1, 1,'Module tamper restore (presence ok)         '
 94,0, 1,'Alarm - module tamper (TMP input)           '
 94,1, 1,'Module tamper restore (TMP input)           '
 95,0,12,'Output overload                             '
 95,1,12,'Output overload restore                     '
 96,0,12,'No output load                              '
 96,1,12,'Output load present                         '
 97,0, 1,'Long zone violation                         '
 97,1, 1,'Long zone violation restore                 '
 98,0, 1,'No zone violation                           '
 98,1, 1,'No zone violation restore                   '
 99,0, 1,'Zone violation                              '
 99,1, 1,'Zone restore                                '
100,0, 1,'Medical request (button)                    '
100,1, 1,'Release of medical request button           '
101,0, 1,'Medical request (remote)                    '
101,1, 1,'Remote medical request restore              '
110,0, 1,'Fire alarm                                  '
110,1, 1,'Fire alarm zone restore                     '
111,0, 1,'Fire alarm (smoke detector)                 '
111,1, 1,'Smoke detector zone restore                 '
112,0, 1,'Fire alarm (combustion)                     '
112,1, 1,'Combustion zone restore                     '
113,0, 1,'Fire alarm (water flow)                     '
113,1, 1,'Water flow detection restore                '
114,0, 1,'Fire alarm (temperature sensor)             '
114,1, 1,'Temperature sensor zone restore             '
115,0, 1,'Fire alarm (button)                         '
115,1, 1,'Release of fire alarm button                '
116,0, 1,'Fire alarm (duct)                           '
116,1, 1,'Duct zone restore                           '
117,0, 1,'Fire alarm (flames detected)                '
117,1, 1,'Flames detection zone restore               '
120,0, 1,'PANIC alarm (keypad)                        '
121,0, 2,'DURESS alarm                                '
122,0, 1,'Silent PANIC alarm                          '
122,1, 1,'Silent panic alarm zone restore             '
123,0, 1,'Audible PANIC alarm                         '
123,1, 1,'Audible panic alarm zone restore            '
126,0, 5,'Alarm - no guard                            '
130,0, 1,'Burglary alarm                              '
130,1, 1,'Zone restore                                '
131,0, 1,'Alarm (perimeter zone)                      '
131,1, 1,'Perimeter zone restore                      '
132,0, 1,'Alarm (interior zone)                       '
132,1, 1,'Interior zone restore                       '
133,0, 1,'Alarm (24h burglary zone)                   '
133,1, 1,'24h burglary zone restore                   '
134,0, 1,'Alarm (entry/exit zone)                     '
134,1, 1,'Entry/exit zone restore                     '
```

```
135,0, 1,'Alarm (day/night zone)                         '
135,1, 1,'Day/night zone restore                         '
136,0, 1,'Alarm (exterior zone)                          '
136,1, 1,'Exterior zone restore                          '
137,0, 1,'Alarm (tamper perimeter)                       '
137,1, 1,'Tamper perimeter zone restore                  '
139,0, 1,'Verified alarm                                 '
143,0,11,'Alarm - communication bus trouble              '
143,1,11,'Communication bus ok                           '
144,0, 1,'Alarm (zone tamper)                            '
144,1, 1,'Zone tamper restore                            '
145,0, 1,'Alarm (module tamper)                          '
145,1, 1,'Module tamper restore                          '
150,0, 1,'Alarm (24h no burglary zone)                   '
150,1, 1,'24h no burglary zone restore                   '
151,0, 1,'Alarm (gas detector)                           '
151,1, 1,'Gas detection zone restore                     '
152,0, 1,'Alarm (refrigeration)                          '
152,1, 1,'Refrigeration zone restore                     '
153,0, 1,'Alarm (heat loss)                              '
153,1, 1,'Heat loss zone restore                         '
154,0, 1,'Alarm (water leak)                             '
154,1, 1,'Water leak zone restore                        '
155,0, 1,'Alarm (protection loop break)                  '
155,1, 1,'Protection loop break zone restore             '
156,0, 1,'Alarm (day/night zone tamper)                  '
156,1, 1,'Day/night zone tamper restore                  '
157,0, 1,'Alarm (low gas level)                          '
157,1, 1,'Low gas level zone restore                     '
158,0, 1,'Alarm (high temperature)                       '
158,1, 1,'High temperature zone restore                  '
159,0, 1,'Alarm (low temperature)                        '
159,1, 1,'Low temperature zone restore                   '
161,0, 1,'Alarm (no air flow)                            '
161,1, 1,'No air flow zone restore                       '
162,0, 1,'Alarm (carbon monoxide detected)               '
162,1, 1,'Restore of carbon monoxide (CO) detection      '
163,0, 1,'Alarm (tank level)                             '
163,1, 1,'Restore of tank level                          '
200,0, 1,'Alarm (fire protection loop)                   '
200,1, 1,'Fire protection loop zone restore              '
201,0, 1,'Alarm (low water pressure)                     '
201,1, 1,'Low water pressure zone restore                '
202,0, 1,'Alarm (low CO2 pressure)                       '
202,1, 1,'Low CO2 pressure zone restore                  '
203,0, 1,'Alarm (valve sensor)                           '
203,1, 1,'Valve sensor zone restore                      '
204,0, 1,'Alarm (low water level)                        '
204,1, 1,'Low water level zone restore                   '
205,0, 1,'Alarm (pump activated)                         '
205,1, 1,'Pump stopped                                   '
206,0, 1,'Alarm (pump trouble)                           '
206,1, 1,'Pump ok                                        '
220,0, 1,'Keybox open                                    '
220,1, 1,'Keybox restore                                 '
300,0, 4,'System module trouble                          '
300,1, 4,'System module ok                               '
301,0, 4,'AC supply trouble                              '
301,1, 4,'AC supply ok                                   '
302,0, 4,'Low battery voltage                            '
302,1, 4,'Battery ok                                     '
303,0, 0,'RAM memory error                               '
305,0, 4,'Main panel restart                             '
306,0, 0,'Main panel settings reset                      '
306,1, 0,'System settings restored from FLASH memory     '
309,0, 4,'Battery damaged (high resistance)              '
309,1, 4,'Battery ok (resistance ok)                     '
312,0, 1,'Supply output overload                         '
312,1, 1,'Supply output overload restore                 '
330,0, 8,'Proximity card reader trouble                  '
330,1, 8,'Proximity card reader ok                       '
333,0,11,'Communication bus trouble                      '
333,1,11,'Communication bus ok                           '
337,0, 4,'Battery charging trouble                       '
337,1, 4,'Battery charging ok                            '
339,0, 4,'Module restart                                 '
344,0, 4,'Receiver jam detected                          '
344,1, 4,'Receiver jam ended                             '
350,0, 0,'Transmission to monitoring station trouble     '
350,1, 0,'Transmission to monitoring station ok          '
```

```
351,0, 0,'Telephone line troubles                        '
351,1, 0,'Telephone line ok                              '
370,0, 1,'Alarm (auxiliary zone perimeter tamper)        '
370,1, 1,'Auxiliary zone perimeter tamper restore        '
373,0, 1,'Alarm (fire sensor tamper)                     '
373,1, 1,'Fire sensor tamper restore                     '
380,0, 1,'Zone trouble (masking)                         '
380,1, 1,'Zone ok (masking)                              '
381,0,32,'Radio connection troubles                      '
381,1,32,'Radio connection ok                            '
383,0, 1,'Alarm (zone tamper)                            '
383,1, 1,'Zone tamper restore                            '
384,0,32,'Low voltage on radio zone battery              '
384,1,32,'Voltage on radio zone battery ok               '
388,0, 1,'Zone trouble (masking)                         '
388,1, 1,'Zone ok (masking)                              '
400,0, 2,'Disarm                                         '
400,1, 2,'Arm                                            '
401,0, 2,'Disarm by user                                 '
401,1, 2,'Arm by user                                    '
402,0, 2,'Group disarm                                   '
402,1, 2,'Group arm                                      '
403,0,15,'Auto-disarm                                    '
403,1,15,'Auto-arm                                       '
404,0, 2,'Late disarm by user                            '
404,1, 2,'Late arm by user                               '
405,0, 2,'Deferred disarm by user                        '
405,1, 2,'Deferred arm by user                           '
406,0, 2,'Alarm cleared                                  '
407,0, 2,'Remote disarm                                  '
407,1, 2,'Remote arm                                     '
408,1, 1,'Quick arm                                      '
409,0, 1,'Disarm by zone                                 '
409,1, 1,'Arm by zone                                    '
411,0, 0,'Callback made                                  '
412,0, 0,'Downloading successfully finished              '
413,0, 0,'Unsuccessful remote downloading attempt        '
421,0, 3,'Access denied                                  '
421,1, 3,'Access denied                                  '
422,0, 3,'User access                                    '
422,1, 3,'User access                                    '
423,0, 1,'Alarm - armed partition door opened            '
441,1, 2,'Arm (STAY mode)                                '
442,1, 1,'Arm by zone (STAY mode)                        '
454,0, 2,'Arming failed                                  '
458,0, 2,'Delay activation time started                  '
461,0, 1,'Alarm (3 wrong access codes)                   '
462,0, 3,'Guard round                                    '
462,1, 3,'Guard round                                    '
570,0, 1,'Zone bypass                                    '
570,1, 1,'Zone unbypass                                  '
571,0, 1,'Fire zone bypass                               '
571,1, 1,'Fire zone unbypass                             '
572,0, 1,'24h zone bypass                                '
572,1, 1,'24h zone unbypass                              '
573,0, 1,'Burglary zone bypass                           '
573,1, 1,'Burglary zone unbypass                         '
574,0, 1,'Group zone bypass                              '
574,1, 1,'Group zone unbypass                            '
575,0, 1,'Zone auto-bypassed (violations)                '
575,1, 1,'Zone auto-unbypassed (violations)              '
601,0, 6,'Manual transmission test                       '
602,0, 0,'Transmission test                              '
604,0, 2,'Fire/technical zones test                      '
604,1, 5,'End of fire/technical zones test               '
607,0, 2,'Burglary zones test                            '
607,1, 5,'End of burglary zones test                     '
611,0, 1,'Zone test ok                                   '
612,0, 1,'Zone not tested                                '
613,0, 1,'Burglary zone test ok                          '
614,0, 1,'Fire zone test ok                              '
615,0, 1,'Panic zone test ok                             '
621,0, 0,'Reset of event log                             '
622,0, 0,'Event log 50% full                             '
623,0, 0,'Event log 90% full                             '
625,0, 6,'Setting system real-time clock                 '
625,1, 0,'System real-time clock trouble                 '
627,0, 4,'Service mode started                           '
628,0, 4,'Service mode finished                          '
```

```
 979,0, 4,'Error of MAC/ID for SATEL server           '
 979,1, 4,'MAC/ID for SATEL server ok                 '
 980,0, 4,'No connection with SATEL server            '
 980,1, 4,'Connection with SATEL server ok            '
 981,0, 6,'GSM module restart                         '
 982,0, 6,'Change of user telephone code              '
 983,0, 6,'User telephone code broken                 '
 984,0, 1,'Alarm - ABAX device tamper (no connection) '
 984,1, 1,'ABAX device tamper restore (connection ok) '
 985,0,15,'Exit time started                          '
 986,0, 1,'Warning alarm                              '
 987,0, 2,'Warning alarm cleared                      '
 988,0, 1,'Arming aborted                             '
 989,0, 7,'User logged in (INT-VG)                    '
 989,1, 7,'User logged out (INT-VG)                   '
 990,0, 4,'No connection with KNX system              '
 990,1, 4,'Connection with KNX system ok              '
 991,0, 1,'Zone auto-bypassed (tamper violations)     '
 991,1, 1,'Zone auto-unbypassed (tamper violations)   '
 992,0, 6,'Confirmed troubles                         '
 993,0, 6,'Confirmed use of RX key fob with low batt. '
 994,0, 6,'Confirmed use of ABAX key fob with low batt.'
 995,0, 3,'Remote RX key fob with low battery used    '
 995,1, 3,'Remote RX key fob with low battery used    '
 996,0, 3,'Remote ABAX key fob with low battery used  '
 996,1, 3,'Remote ABAX key fob with low battery used  '
 997,0, 4,'Long transmitter busy state                '
 997,1, 4,'Restore of long transmitter busy state     '
 998,0, 0,'Transmission test (station 1)              '
 999,0, 0,'Transmission test (station 2)              '
1000,0, 1,'Trouble (zone)                             '
1000,1, 1,'Trouble restore (zone)                     '
1001,0, 2,'Forced arming                              '
1002,0, 4,'No network (PING test)                     '
1002,1, 4,'Network ok (PING test)                     '
1003,0, 2,'Arming aborted                             '
1004,0, 0,'Downloading started from ETHM/GSM module   '
1005,0, 6,'ETHM-1-downloading started                 '
1006,0, 4,'Current battery test - absent/low voltage  '
1006,1, 4,'Current battery test - ok                  '
1007,0, 1,'Exit time started                          '
1008,0, 2,'Exit time started                          '
1009,0,14,'SMS control - begin                        '
1009,1,14,'SMS control - end                          '
1010,0,14,'SMS with no control received               '
1011,0,14,'SMS from unauthorized telephone received   '
1012,0, 6,'CSD-downloading started                    '
1013,0, 6,'GPRS-downloading started                   '
1014,0, 4,'No signal on DSR input                     '
1014,1, 4,'Signal on DSR input ok                     '
1015,0, 4,'Time server error                          '
1015,1, 4,'Time server ok                             '
1016,0, 6,'Time synchronization started               '
1017,0, 9,'SMS messaging ok                           '
1018,0, 9,'SMS messaging failed                       '
1019,0, 3,'Remote key fob used                        '
1019,1, 3,'Remote key fob used                        '
1020,0, 4,'LCD/PTSA/ETHM-1 initiation error           '
1021,0, 4,'LCD/PTSA/ETHM-1 initiation ok              '
1022,0, 0,'Downloading request from ETHM-1 module     '
1023,0, 6,'Tamper info cleared                        '
```

The meaning of source number - nnnnnnnn field:

- if users numbering:

1..240	-	user
241..248	-	master
249	-	INT-AV
251	-	SMS
252	-	timer
253	-	function zone
254	-	Quick arm
255	-	service

- if zone|expander|keypad numbering:

1..128	-	zone
129..192	-	expander at address 0..63

INTEGRA 24 and 32:

193..196	-	real LCD keypads or INT-RS modules at address 0..3
197..200	-	keypad in GuardX connected to LCD keypad at address 0..3, or www keypad in internet browser connected to ETHM-1 at address 0..3
201	-	keypad in DloadX connected to INTEGRA via RS cable
202	-	keypad in DloadX connected to INTEGRA via TEL link (modem)

INTEGRA 64, 128, 128-WRL and 256:

193..200	-	real LCD keypads or INT-RS modules at address 0..7
201..208	-	keypad in GuardX connected to LCD keypad at address 0..7, or www keypad in internet browser connected to ETHM-1 at address 0..7
209	-	keypad in DloadX connected to INTEGRA via RS cable
210	-	keypad in DloadX connected to INTEGRA via TEL link (modem)

- if output|expander numbering:

1..128	-	output
129..192	-	supply output in expander at address 0..63

Note: in INTEGRA 256 - if event record describes zone or output (1..128), so read the uuuuu field and:
if uuuuu = 00000 - the zone or output number is 1..128,
if uuuuu = 00001 - add 128 to the zone or output number - i.e. 1..128 becomes 129..256.

Reading filtered events

To read filtered events the previous command is modified as shown below:
```
0x79 0x08 0xFA n1 n2 n3 str1 str2 str3 str4 tp crc
```
where str1.str2.str3.str4 is binary list of partitions event from whose should be found, and tp states event types to be found:

tp.0 - zone alarm and tamper
tp.1 - other alarm
tp.2 - arm, disarm and alarm clear
tp.3 - zone bypass
tp.4 - access control
tp.5 - trouble
tp.6 - user function
tp.7 - system

Answer is the same, as in previous case of 0x79 command.

Converting event code to text

The list of events given above can be used to convert RCCccccccc to text, or it can be done using the command below:

```
0x80 0x30 0x03 0xFB cH cL crc
```

The bytes above are d1..dn bytes to send as described in Tab. 1 (the crc above and the crc in Tab. 1 are two diffenent check sums).
The crc above = 0x13 + 0x30 + 0x03 + 0xFB + cH + cL.
The cH.cL bytes are how to decode event code to text description:

> .15   - 0 = short, 1 = long text description
> 11 lsb   - event code (i.e. RCCccccccc bits)

The answer is as follows:

```
6A 30 16 FB cH cL dd dsH dsL [16 bytes of text] crc   - if asked about short text description
```
or:
```
6A 30 34 FB cH cL dd dsH dsL [46 bytes of text] crc   - if asked about long text description
```

The crc above = 0x13 + 0x6A + 0x30 + 0x16/0x34 + 0xFB + cH + cL + dd + dsH + dsL + [16/46 bytes of text].
The cH.cL bytes are copied from question.
The dd byte is long tdescription.
The dsH.dsL is short description.

Kind of long description (dd byte from above)

- 0 - no addictional description
- 1 - partition/zone|expander|keypad
- 2 - partition/user
- 3 - partition keypad/user (partition keypad address in PPPPPR) (not LCD keypad, but LED partition keypad, e.g. INT-S)
- 4 - zone|expander|keypad
- 5 - partition
- 6 - keypad/user
- 7 - user
- 8 - expander reader head
- 9 - telephone
- 10 - output of telephone relay type
- 11 - partition/data bus
- 12 - partition/output|expander (partition not important for main panel outputs)
- 13 - partition/output|expander (partition not important for outputs)
- 14 - telephone in PPPPP/user (telephone: 0 - unknown, 1.. - phone number)
- 15 - partition/timer
- 30 - beginning of TCP/IP address (keypad address in PPPPP)
- 31 - 3rd and 4th bytes of TCP/IP address
- 32 - partition/zone or ABAX output

Kind of short description (the dsH.dsL bytes from above = MrIRoDnT.gtwmkues below)

- s - partition
- e - zone/expander/LCD-keypad
- u - user
- k - expander in RPPPPP
- m - LCD-keypad in PPPPP
- w - output/expander, partition only for expandera
- t - timer
- g - proximity card reader
- T - telephone
- n - number (RAM error)
- D - data bus (0=DTM, 1=DT1, 2=DT2, 129..128+IL_EXPAND=expander)
- o - call back (0='SERV', 1='SERV=', 2='USER', 3='USER=', 4='ETHM-modem', 5='ETHM-RS')
- R - telephone relay
- I - TCP/IP event (2 rekords !!!)
- r - ABAX input/output, partition only for input
- M - monitoring