MYC Reserved Commands

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Introduction

This paper describes the reserved commands of the MYC protocol.
For more details of the MYC system please check the reference.

Definitions and formats

see https://dk1ri.de/myc/Definitions.txt or https://dk1ri.de/myc/Definitions.pdf

Overview

Every MYC device should provide mandatory reserved command tokens and understand them, if applicable.
The set of announcements of a MYC device should be in numerical sequence, start with the reserved basic command 0x00 and end with the other reserved tokens 0xxxf0 - 0xxxff. Rules lines may follow . In the full anouncment-list of CR the last line of each device is the I-announcement. This is necessary, to identify commands in systems with hierarchical (stacked) command-routers.

Nine of the reserved tokens are used and defined now: 0x00, 0xxxf0, 0xxxf1 and 0xxxf9 – 0xxxff.
It is noted, that the commands below are shown as operate / answer (o / a) commands, but may be used in a real announcement as k / l commands, which will not be included to the full list by the CR.

Basic Command 0x00

The one byte 0x00 basic command is mandatory for all MYC devices.

The basic announcement is called with the one byte command 0x00.

announce: 0;<dt>;MANUFACTURER;DEVICEDESCRIPTION;VERSION;NUMBER_OF_DEVICES;LINELENGTH;
COMMAND_BYTES;NUMBER_OF_ANNOUNCELINES;SPEC_VERSION

command: 0x00
answer / info: 0x00<basic announcement line>   <basic announcement line> as string <s> (with one byte length)

The announcement is fixed and therefore the announce-line do not describe the format of the command but is the content, which is transmitted as answer of the command 0x00.
The length of the string is a one byte string-length. The 0x00 announcement is limited therefore to 255 Bytes.

MANUFACTURER DEVICEDESCRIPTION and VERSION are combined to a devicegroupname and are used in file names, so not all character are allowed. Preferred is a-z, A-Z, 0-9 _
These devicegroupnames are unique to a device and its firmware. A (published) device / firmware combination with a devicegroupname must not be changed. If changes are necessary, a new version must be used. Each device with its individualization belongs to a devicegroup. So, this is valid also for controlled programs, but not for controlled CR and and not for all controlling devices.
For a normal device NUMBER_OF_DEVICES is 1, For CR it is CR + all FU + CR + RU + number given by lower level CR. This value is important for the command-router as info for a higher level CR.
LINELENGTH is the maximum line-length of the announcement lines.
COMMAND_BYTES is the number of bytes used for commands. Allowed values are 1 to 8. Higher numbers are handled as one byte.
NUMBER_OF_ANNOUNCELINES includes "R" and "I" lines. This is the size of the announcement memory. A different transmission length of this number result in a CR startup procedure: see http://dk1ri.de/myc/Description.pdf.
A (translated) 0x00 command of a device is answered by the CR itself and not send to the device for answer.
SPEC_VERSION is the version of specification, the device is designed for: <branch>-<version>. <version> is a set of specification defined in [13]. Within a branch the CR must be compatible to a specific <version> and all lower <versions>.

Announcement Command 0xxxf0

The 0xxxF0 announcement command is mandatory for all MYC devices. ANNOUNCEMENTS must be the 1st <des>.

announce: 240;an,ANNOUNCEMENTS,<des>...<des>;<LINELENGTH>;<NUMBER_OF_ANNOUNCELINES>
                                                                                      (240 for 1 byte command-token)
command: 0xxxf0<n><m>   ask for m announcement lines starting at

answer / info: 0xxxf0<n><m><data>

<n> is a positional parameter of the memory. The number of bytes for <m> and <n> must not exceed <NUMBER_OF_ANNOUNCELINES>.
< NUMBER_OF_ANNOUNCELINES> is the number of the announcement lines including those for the reserved commands, rules and for the CR the I-lines. (Same as in the 0x00 command).

The CR will ask for the announce-lists of all devices using the 0xxxf0 command, if it do not have other sources. It will drop the 0xxxf0 command of other devices when building the complete list. The command-router answers all announcement commands by itself using the full list with translated command-token. The CR will not forward 0xxxf0 infos.
The CR will not include "r" and "s" commands in the full list but skip these numbers instead. The command-token are reserved for the delivering devices. Exception: the LD will get the list with the complete "r" and "s" commands.

Announcement Command 0xxxf1

The 0xxxf1 announcement command is used by the CR only. BASIC ANNOUNCEMENTS must be the 1st <des>

announce: 241;an,BASIC ANNOUNCEMENTS,<des>...<des>;<LINELENGTH><NUMBER_OF_DEVICES>
                                                                            241 for 1 byte command-token
command: 0xxxf1<n><m>   ask for basic m announcement lines
                                                                            start at n ("0" based) <m> and <n> must
                                                                            not exceed <NUMBER_OF_DEVICES>
answer / info: 0xxxF1<n><m><data>

Feature for SK 0xxxf9

This command is used by the CR and SK only. SK-FEATURE must be the 1st <des>.

Announce: 249;oa,SK-FEATURE[,<des>]...;<OPTION>[,<des>]...
command;   0xxxF9<n><data>
answer / info: -

defined <OPTION>s

<l>,ANSWERS   used by CR: <l> is the maximum length of a string with a list of (binary) token of basic announcements of devices, for which the SK want answers and infos, numbers, or * only. * means all (default) (do not mix * and command-token). The CR will use the default after USERTIMEOUT. This feature is not remembered by the CR and must be set after SK connection timeout.

<b>,STOP   used by SK only; mandatory. The CR will send 0xf01 to signal, that the input buffer is full and further data are ignored. Default: 0x00

Features Command 0xxxfa

This is not a command but a description announcement of optional additional feature and properties of a device-group, which cannot be modified.
This line is optional and not forwarded by the CR, if all <OPTION> are used by the CR only.
The command announcement has the 1st <des> "FEATURE".

announce: 250;ia,FEATURE[,<des>]...[,<des>];<ty>,<OPTION>,[<des>..][;...]
command: -
answer / info   -

Defined <OPTION> are:
b,INFO,<DEFAULT>   FU only. Optional, can be used, if infos are send; must not be defined otherwise
                                   0:       info used, but no polled interface
                                   other: requested info polling time in 10ms. <DEFAULT> is 10 (means 100ms)
<sm>,INFOCOMMANDS   FU only. The CR should poll the commands given in this ls list
a,MULTI_ANSWER,<DEFAULT>   FU only, Optional, 1, if device can handle multiple answer commands, DEFAULT: 0 for polled devices as
                                   I2C, 1 for others. For polled devices with default, the master must get the answer within 1 second. After that time the FU may delete the answer.

w,COMMANDDELAY<DEFAULT>   in ms, DEFAULT is 100. The CR will wait for this time, before sending another command. This will allow slow devices to handle commands. 0 means, that the device can buffer commands. The FU will not accept commands during that time. The FU will also do so, until all data are sent to the master.

Log on Command 0xxxfb

This command is used by the RU only. Used, if the system requires a log on for users to allow all or a subset of commands. The RU will then send a string with "Q" rules to the CR. From this the CR will use a individual list of commands for this user and block all other commands.
For more details see   http://dk1ri.de/myc/Rules_device.pdf
The command announcement has the first command-type description "LOGON". Only the given properties are allowed in this sequence:
NAME and PASSWORD is limited to 255 characters (1 byte length of string).

announce: 251;ob,LOGON[,<des>];<b>,MODE;<l>,NAME;<l>,PASSWORD
MODE: 1   log out
            2   log on
            3   switch on user management (admin only)
            4   switch off user management (admin only)
command: 0xxxfb0x000x03<mode><name><password>
answer / info   -

Last Error Command 0xxxfc

This command is mandatory for FU and delivers the last error the device detected.
The command announcement has the 1st <des> "LAST ERROR" to identify them in a list with the translated command-token, which is sent by the command-router.
announce: 252;aa,LAST ERROR[,<des>];<s><,des>
command   0xxxfc
answer / info: 0xxxfc<s>
Devices may send error infos. CR do checks on positional and string overflow for data from SK and may send error infos if applicable.
Out of range   sent by CR in case of positional and string overflow of SK
Other messages to be defined.

Administrative Data Command 0xxxfd

This command deliver administrative data of the device.
Multiple <OPTION> are addressed by position.
The command announcement has the 1st <des> "MYC INFO".

```
announce:      253;aa,MYC INFO[,<des>]...[,<des>];<ty>,<OPTION>,[<des>..][;...}
command:       0xxxfd<n><data>              <n> omitted for one element array
answer / info: 253<n><s>|<n>                send info of position m
```

defined <OPTION>s	Values:	
b,ACTIVE		mandatory as first element
	01	not yet ready (after startup)
	03	busy
	04	ready and active
	other <n>	try again in <n> seconds, default try again is 10s
b,ANNOUNCELIST	<n>	(new) list <n> available; for CR only
b,ANSWERTIMEOUT	<n>	for polled devices: After timeout output data are deleted and new commands are executed. In 100ms, Default is 10 (1s)
b,CHANNELTIMEOUT	<n>	used by CR multi-channel interfaces only in seconds.
B, CHANNELNUMBER	<n>	used by CR multi-channel interfaces only default is 0: public channel.

more to be defined.

Individualization Commands 0xxxfe and 0xxxff

The individualization commands are mandatory for all devices except some SK.
The individualisation commands are not copied to the full announce-list. Instead the "I" line with reduced data is added.
CR has no 0xxxfe command.
These commands write and read the individual properties of a device as names and number This differentiates different devices of the same device-group in a system. It also provide properties of the communication with the command-router.
Also configuration parameters for selecting hardware variation should be stored here, if wrong configuration may cause malfunction.

The command announcements have the 1st <des> "INDIVIDUALISATION.

For security reasons, the 0xxxfe and 0xxxff command are dropped in the full command-list, which is generated by the CR. So these properties are not written during normal usage. They can be written for individualization before the normal usage.
The SK may need some individual data as the name for proper labeling. It must differetiate identical commands of devices with the same device-type. It will use the I-announcement, which is described in I-announcements below.
The CR will not change the command-tokens during runtime, but may do this at new start, if the sequence of devices within the config file of the CR is modified or lower level CR deliver different data.

It is not necessary that all of the readable properties are writable as well.
At start up the CR must know the individual communication properties for the devices, which therefore must be stored locally. The CR will not connect to unknown devices.

announce: 254;ka,INDIVIDUALISATION[,des];<ty>,<OPTION>,<DEFAULT>[,<des>]..
command   254<m><data>   <m> is the sequence number of the OPTION (0 based)
answer / info: -

announce: 255;la,INDIVIDUALISATION[,des];<ty>,<OPTION>,<DEFAULT>[,<des>]..
command   255<m>   <m> is the sequence number of the OPTION (0 based))
answer / info: 255<m><data>   parameter <m>

The following is a list of defined command-properties and values; This list is not complete; updates may follow.
Because there may be hardware variations, many keywords may appear. Please try to use standardized, english, names,
For multiple interfaces <OPTION>s for each interface must be grouped together and start with the interface-type as USB, TELNET,....
The interfaces are the "listen" interface, where commands are accepted. So SK has no interface mentioned.
A device with multiple interfaces may have not all interfaces active, depending on hardware variants with the same firmware. This will be defined by a bit during individualization. A device will ignore inputs from deactivated interfaces except for the 0xxxfe command.
A <DEFAULT> is mandatory where given.

OPTION>	comment:
<l>,NAME,<DEFAULT>	actual name, mandatory write/read; < 256 characters
<n>,NUMBER,<DEFAULT>	actual number, mandatory write/read

\<n\>,DISPLAYSIZE,\<DEFAULT\>,{\<size1\>,..}	\<DEFAULT\> is positional parameter of sizex
	\<sizex\> something like 16x2, 1024p
\<a\>,I2C|RS232|CAN|RC5|RC6|SPI	
USB|TELNET|HTTP|HTTPS|TERMINAL|	Interfaces a device can have, followed by the other parameters.
SSH|RADIO	0: not active; 1: active
	The CR may add a "M" to the label if it supports multiuser access.

Defined Interfaces:

a,SERIAL,\<DEFAULT\>	general serial Interface, may have other options as below.
a,I2C|,\<DEFAULT\>;	
b,ADRESS,\<DEFAULT\>{1 to 127}	{1 to 127}, mandatory
a,SPI,\<DEFAULT\>;	slave!
a,DATA_ORDER\<DEFAULT\>;	0:MSB first, 1: LSB first, mandatory
a,POLARITY,\>DEFAULT\> ;	when idle: 0:clock low, 1: clock high, mandatory
a,PHASE,\<DEFAULT\>	mandatory
a,RS23,\<DEFAULT\>;	default: auto, 8N1
b.BAUDRATE,\<DEFAULT\>,{0,19200,...};	Baudrate, optional. 0 is auto
3,NUMBER_OF_BITS,{8N1};	something like this, optional
b.COMPORT	COM Port number, mandatory
a,TELNET|TELNETM,\<DEFAULT\>	server !!
a,SSH,\<DEFAULT\>;	server !!
w,PORT,\<DEFAULT\>;	portnumber, optional
s,ADRESS,\<DEFAULT\>;	IP address or DNS Name, mandatory
b,TIMEOUT,\<DEFAULT\>	Timeout, optional
a,HTTP|,\<DEFAULT\>;	server !!

```
s,ADRESS,<DEFAULT>;                          mandatory
b,TIMEOUT,<DEFAULT>                          Timeout,optional

a,TERMINAL|,<DEFAULT>                         usually for CR only, interface, from where the program is called, no other options.

a,USB,<DEFAULT>;                             slave

a,RC5,<DEFAULT>;
b,ADRESS,<DEFAULT>,{1 to 32}                 mandatory

a,RC6,<DEFAULT>;
b,ADRESS,<DEFAULT>,{1 to 64}                 mandatory

a,CAN,<DEFAULT>;
b,ADRESS,<DEFAULT>                            mandatory

a,RADIO,<DEFAULT>                            Wireless interface
```

I-announcements

I-announcements are created by the CR and used in the full announce-list.
They are appended after the announcements of each device. The I-announcement of a lower level CR is replaced by the own.
The format is:
(fullname = device_type;device_name;device_number)
I;full_name_of_command-router; full_name_of_device

Fullname_of_command-router must be unique in a multi level MYC system, fullname_of_device must be unique in a subsystem
Device-name and device-number of the device are defined during individualization or are default.
The device-type is MANUFACTURER;DEVICEDESCRIPTION;VERSION

Not valid command token

If the output buffer of a device is polled by the CR – in case of I2C for example – and the are no valid data, the
device will answer with the not valid command token. This token is &H80 for one byte command token; &H8080 for 2 byte …
This token is not used otherwise by the device and not mentioned in the announcement list.

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Reference

[1]   https://dk1ri.de/myc/MYC.pdf (german)
[2]   https://dk1ri.de/myc/MYC.en.pdf
[3]   https://dk1ri.de/myc/Description.txt or https://dk1ri.de/myc/Description.pdf
[4]   https://dk1ri.de/myc/commands.txt or https://dk1ri.de/myc/commands.pdf
[5]   https://dk1ri.de/myc/Reserved_tokens.txt or https://dk1ri.de/myc/Reserved_tokens.pdf
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