

Domintell Light Protocol guide and DRS2320x / ETHERNET communication interface.

The goal of this document is to describe Domintell's RS232 & ETHERNET interfaces. It will help you to make the good choice between the options available. Input specifications are the same for all modules (data to Domintell). Output protocol specifications are different (data from Domintell)

DRS23201 – DRS23202 - DRS23203 // DETH02 – DETH03 - DETH04 :

The hardware does not change but the functions depend on the firmware. These modules are explained below in details.

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1. Document revisions

v1.23 : 17/11/2014

DRS23202 (v21) + DETH02 (v22) + v1.23.00 :

- Add : DMV01
 - DMV 2-1Output DMV01[House|]
 - DMV 2-1Output DMV01 2[House|]
 - DMV 2-1Output DMV01 3[House|]
 - DMV 2-1Auxiliary 1[House|]
 - DMV 2-1Auxiliary 2[House|]

v1.21 : 22/10/2014

Add chapter 4.1 Initiate communication with DETH02 to correctly handle negotiation between DETH02 and third-party application.

Add note about outdated firmware version of DETH02/DRS23202 in paragraph 3.1.e Samples of strings sent to your Domintell installation.

v1.21 : 09/09/2014

DETH04 is now discontinued.

Improve this documentation

- Chapter
- Add information for %M and %R parameters

v1.21 : 14/11/2013

DETH02 (v21) :

- If delay between two frames sent to Ethernet port of DETH02 module is smaller than 4ms, newer packets may be lost. Wait the answer (if any) or wait at least 5ms between two Ethernet frames.

- Add : fix APPINFO + full test with 2 modules in the same system,

DRS23202 (v20) + DETH02 (v21) + v1.21.00 :

- Add : DVIP01, DVIP02 (inputs only)
- Add : DPBR04

APPINFO :

- Add : infos about ETH reserved command "HELP" in "Input Protocol Specifications" paragraph.
- Improve Cam infos :

```
CAM 1Axis Cam01[AXIS][IP=192.168.0.2]
CAM 2Cam DVIP01[DVIP][DHCP][IP=192.168.0.3]
      [JPG=http://192.168.0.3:80/jpg/image.jpg]
CAM 3Cam DVIP02[DVIP][IP=192.168.0.4]
      [JPG=http://192.168.0.4:80/jpg/image.jpg]
```

- Add input informations :

```
[NOLINK]
[PUSH=SHORT]: handles short push only
[PUSH=LONG]: handles short + long push
```

- Add T° sensors informations :

```
[NOLINK]
[LOCAL]: actions to sensor's modes + dependencies only
[GLOBAL]: actions to sensor's modes + all other GLOBAL sensors
[HMR=0x0D-HMT=0x08]:
```

HMR=Hide Mode Regul : should not be accessed if 1

```
Mask MODEREGUL_OFF (0x01)
Mask MODEREGUL_HEAT (0x02)
Mask MODEREGUL_COOL (0x04)
Mask MODEREGUL_MIX (0x08)
```

HMT=Hide Mode Temp : should not be accessed if 1

```
Mask MODETEMP_AUTO (0x01) (Low nibble : when heating)
Mask MODETEMP_CONFORT (0x02)
Mask MODETEMP_ABSENCE (0x04)
Mask MODETEMP_GEL (0x08)
Mask MODETEMP_AUTO (0x10) (High nibble : when cooling)
Mask MODETEMP_CONFORT (0x20)
Mask MODETEMP_ABSENCE (0x40)
Mask MODETEMP_GEL (0x80)
```

v1.20 : 26/03/2013

DRS23202 (v18) + DETH02 (v17) + v1.20.02 :

APPINFO :

DDMX01: Add channels details

```
DMX 91-1DMX output 1 RGBI[House|]][4 CHANNELS]
DMX 91-1-CH1:Chan. R[R 0x00-0xFF]
DMX 91-1-CH2:Label G[G 0x00-0xFF]
DMX 91-1-CH3:Chan. B[B 0x00-0xFF]
DMX 91-1-CH4:Chan. I[I 0x00-0x64]
```

Camera list:

```
CAM 1Entrance[IP=192.168.1.10]
```

SYS T° Mode: Modify value infos to [VALU,1-2-5-6,LOOP]

where 1=Absence, 2=Auto, 5=Comfort, 6=Frost

Light protocol : input parameters

'%R01' set Regulation Mode to 1
'%Txx.x' decimal T° value, does not change (Heating setpoint)
'%Uxx.x' decimal T° value, new parameter (Cooling setpoint)
SYS000001 accepts now '%M'
SYS000002 accepts now '%R'
Global sensors are changing mode system variables

Light protocol : output parameters

Does not change: 'Txx.x yy.y TEMPMODE zz.z' where :
x=Measured T°,
y=Actual Heating setpoint T°,
TempMode=sensor T° mode (Absence, Auto, Comfort, Frost)
z=Heating Profile setpoint T°

Add: 'Uxx.x yy.y REGULMODE zz.z' where :
x=Measured T°,
y=Actual Cooling setpoint T°,
RegulMode=regulation mode (0=off, 1=heating, 2=cooling, 3=mixed)
z=Cooling Profile setpoint T°

Add: system variable SYS000002 : Main regulation mode
where 0=Off, 1=heating, 2=cooling, 3=mixed

v1.19 : 12/01/2012

v1.19.17 :

APPINFO : add memo reference : [REF=BIR 23-1] (= memo icon reference)
APPINFO : add input parameters [PUSH=SHORT] [PUSH=LONG] [NOLINK]
APPINFO : displays "END APPINFO .." when finished
APPINFO : displays STATION to get FM station name «STA000001Channel name[64-0100]» (hexa)
APPINFO : version format change : [VERS=0xnn] or [VERS=UNSCANNED]
APPINFO : remove unused system variables (System vars not listed in APPINFO should be ignored)
APPINFO : remove memo type [FOLLOWER]
APPINFO : some system variables are [READONLY]
APPINFO : remove some useless characters : '',';' ...
Light Protocol : add %H, %L params to handle shutters/shutter groups UP (**H**igh) and DOWN (**L**ow)

v1.19 : 06/12/2011

DRS23202 (v16) + DETH02 (v11) + v1.19.15 :

DDMX01 status has new format have change : DMX 1F-2X00EB000000000000
('-' is replaced by 'X' in v11(DETH02) & v16(DRS23202). Cf « Examples of received strings »)

v1.19.15 :

Fix temperature sensor of DTSC02/04 information in PING
Add DDMX01 commands (%X)
Add input simulation commands (%P) (**P**ush)
Fix DAMPLI01 AMP%F with frequency >= 100MHz

v1.19 : 31/03/2011

DRS23202 (v15) + DETH02 (v7) + v1.19.11 :

Handle DTSC02, DTSC04, DTSC35, DDMX01
Several modules can be used on the same installation
DETH02 and DRS23202 are listed in APPINFO with their version

v1.19.11 :

Fix temperature sensor of PBLCD02 information in APPINFO

v1.18 : 27/08/2010

DRS23202 (v14) + DETH02 (v6) :

Info returned by TSBxxxxxx%S is now correct (crlf sequence missing)

v1.18 : 12/07/2010

v1.18.03f : Automatic light protocol improvements

add module type 'I10' (DIN10V02)

DRS23202 (v13) + DETH02 (v5) :

decode COVALUES10V

v1.18 : 18/11/2009

libdeth : version 3.0.0 release :

- Modify function prototype (safer)
- Add functions deth_get_major_version, deth_get_minor_version and deth_get_micro_version

v1.18.01 : Automatic light protocol improvements

add module type 'DMX' (DMX01) but no action/Info defined (later)

v1.17 : 31/03/2009

libdeth : version 2.0.0 release (function name has changed - "@" removed)

v1.17 : 31/03/2009

v1.17.02 : Automatic light protocol improvements
add %P (Push) parameter (simulate a push on MODxISM, MODBUx)
add %DB (Start Dim) and %DE (Stop Dim) params on 'DIM', 'D10', memo dim
add %I%Dxxx (inc by step) and %O%Dxxx (dec by step) params
on 'DIM', 'D10', memo dim and 'AMP'
add %S (status) parameter for all modules and VAR
add %K (Clock) parameter for Clock setting

DRS23202 (v11) + DETH02 (v2) :
add module type 'TPR' (Plage name) and 'TPL' (Plage list)
add 'P' data type for 'TPL' module type
add module type 'CLK' (Clocks)
add 'K' data type for 'CLK' module type

v1.17 : 02/03/2009

add %M (mode) parameter for temp. sensor

v1.17 : 18/11/2008

HELLO command

v1.17 : 27/10/2008

Add information about "Exclusive session"

v1.17 : 11/08/2008 : DRS23202 version 10

MOD_VERSION command

v1.17 : 29/07/2008 : config version v1.17.00

Automatic protocol : T° zones handling
APPINFO command : variables descriptions added

v1.16 : 27/06/2008 : config version v1.16.05

DRS23201 version 5 : can handle all control characters

v1.16 : 13/05/2008 : config version v1.16.03

New memo & sfer automatic input commands
DRS23201 version 4 : parity handling
DRS23202 : DPBTLCD0x handling + DFAN01 improvements (v9)
Description of APPINFO command + display [house|floor|room] + [memo type]
Extended T° display in light protocol.
DETH01 – DETH02 – DETH03 (available from 1.17.00)
SDK : Explanations of password encoding library.
Ethernet/Internet routers explanation.
T° mode handling on sensors

v1.15 : 04/07/2007 : config version v1.15.00

Changes in shutter automatic input commands (DTRV01, DTRP02 & DTRVBT01)

v1.12 : 05/03/2007 : config version v1.14.00

add of DFAN01, DMR01, DLCD03, DIN10V01 modules
add of APPINFO command
add of %I & %O parameters
DRS23202 version 7

v1.11 : 09/01/2007 : config version v1.13.08

add of DOUT10V01 module
DRS23202 version 6

Previous DRS23202 Versions

1. 09/2005 : First release
2. 10/2005 : -
3. 02/2006 : add DTRVBT01, DOUT10V01
4. 03/2006 : add DTRP02
5. 07/2006 : add of DAMPLI01
6. 09/2006 : add clock transfer : once a minute

2. Informations about DRS2320x / DETH0x / DGSM01 communication interfaces

2.1. General information

The goal of this document is to describe Domintell's RS232 & Ethernet interfaces and to help you to make the good choice between the options available. The hardware does not change but the functions depend on the firmware.

There is several ways to communicate with Domintell system depending of the module :

- Input ASCII strings (sent to Domintell system). need creation of links in configuration software (See chapter "Parameters and specific links->DRS23201 module" in Domintell2 Configuration software manual) is working with DRS23201, DRS23202, DETH02, DUSB01 and DGSM01.
- Output ASCII strings (sent to your device). need creation of links in configuration software (See chapter "Parameters and specific links->DRS23201 module" in Domintell2 Configuration software manual) is working with DRS23201, DUSB01 and DGSM01.
- Output Light Protocol (Domintell system to third-party software) is only available on DRS23202 and DETH02. No configuration/link is required in Domintell2 configuration software; it is automatically generated by master module.
- Input Light Protocol (third-party software to Domintell system) is working with DRS23201, DRS23202, DETH02, DUSB01 and DGSM01. No configuration/link is required in Domintell2 configuration software; it is automatically decoded by master module.

To handle multiple DRS23202 and DETH02 in the same installation, configuration software must be >=1.19.11 and firmware must be >= v15(DRS23202) or v7(DETH02).

Output Light Protocol (Domintell system to third-party software) can only be used on installation with less than 241 modules.

2.2. Devices overview

Here is the list of communication modules and their capabilities :

- DRS23201/DUSB01 : RS232 String exchange interface :

The goal of this embedded software is to interface devices like an alarm system, a PC, an external sound module, ... through an RS232 port. ASCII strings are exchanged between your device and your Domintell installation. Each text message must be defined in your Domintell application.

- Input Light Protocol (third-party software to Domintell system);
 - Input ASCII strings (sent to Domintell system).;
 - Output ASCII strings (sent to your device).;
 - input hexadecimal (non-printable) data (third-party software to Domintell system);
 - output hexadecimal (non-printable) data (Domintell system to third-party software).
- DRS23202/DETH02 : RS232/Ethernet Light protocol interface :
The goal of this embedded software is to give you a real-time status of your Domintell installation through an RS232/ETHERNET port. We advise all PC/system integrators to use this module. You don't have to treat or produce each text message. It transfers an ASCII text to your device for each status change on your Domintell installation. It also treats programmed text commands in your application and executes automatic commands for an easy bidirectional communication (since version 1.12.01 and higher).
 - Input Light Protocol (third-party software to Domintell system);
 - Output Light Protocol (Domintell system to third-party software) – only for installation with less than 241 modules;
 - Input ASCII strings (sent to Domintell system)..
 - DRS23203 : RS232 Bang & Olufsen interface. (not covered by this document)
 - DETH03 : Ethernet configuration software interface. (not covered by this document)

- DETH04 : Ethernet visual software interface. (not covered by this document) – discontinued
- DGSM01 : String exchange interface using SMS :
 - Input Light Protocol (third-party software to Domintell system);
 - Input ASCII strings (sent to Domintell system).;
 - Output ASCII strings (sent to your device)..

2.3. DRS2320x wiring information

DRS2320x module is designed be connected to a computer using a straight female-male DB9 cable. If you want control a beamer (for example) using a DRS23201, you have to use a null-modem (cross cable) male-male DB9 cable.

Pin 1 : NC
Pin 2 : TX Data Out
Pin 3 : RX Data In
Pin 4 : DSR Signal In (reserved for handshake - not used)
Pin 5 : Ground
Pin 6 : DTR Signal Out (reserved for handshake - not used)
Pin 7, 8 and 9 : NC

For a specific handshake, support.domintell@trump.be .

2.4. Ethernet wiring information

The RJ45 connector must be connected to the LAN (Local Area Network) with a classic UTP RJ45 Cable (CAT5) to a switch or a router.

WARNING :

Do NOT connect Domintell bus on the DETH0x RJ45 connector, this can cause fatal damages to the DETH0x module.

2.5. DRS23201 specific information

- Baudrate selection : 1200, 2400, 4800, 9600, 19200, 38400, 57600.
- 8 data bits.
- Parity selection (since module version 4) : none, even, odd.
- 1 stop bit.

2.6. DRS23202 specific information

- Fixed baudrate : 57600.
- 8 data bits.
- No parity selection.
- 1 stop bit.

2.7. DETH02 specific information

- IP : DHCP or static. It is highly recommended to set a static IP.
- UDP protocol only.
- Default port 17481 (can be changed).
- Possibility to set a password.
- Only one client can connect to DETH02 module at a time

Please, see tutorial below to interface DETH0x modules with your own application.

3. Protocol specifications

3.1. Input Light Protocol (third-party software to Domintell system)

a) Overview

These commands/strings are executed without doing any links (Automatic Light Protocol).

b) General recommendations/limitations

- Between 2 RS232 messages : minimum 25 milliseconds OR the reserved character '&'.
- Encapsulate multiple LightProtocol messages (not specific DETH0x command) into an ethernet frame : reserved '&' character.
- You can start all messages with a '&' if needed.
- Maximum 30 characters for a message.
- **Important** : we advise you to make less than 100 «string» links on the same input because it's a lot of work for the Central Unit. A WARNING will be displayed into the Diagnose function if there's more than 100 «string» links.
- Light Protocol strings have priority on ASCII (custom) string. If a link is done in Domintell2 configuration software using text "BIR000B4B-1", master unit will decode it as Light Protocol string and will not execute your link.
- Strings '<CR>', '<LF>' and '<TAB>' are replaced by the equivalent ASCII code : 0x0D, 0x0A and 0x09.
- Carriage return & line feed characters are supported at the end of the command line.
- In extended mode (since version 5), control characters can be inserted with '<xx>' where 'xx' is the decimal code. It can be a value between '00' to '31' and must have a length of 2 character.
- Be careful with characters '<CR>' and '<LF>' at the end of the messages.
- Domintell Automatically suppress (trim) the SPACE characters at the begin or at the end of the message.
- Strings are NOT case sensitive. Lower case characters are automatically replaced with upper case equivalent. (Be careful with éèêàñáí...)
- We advise to use only ASCII characters. Accentuated character can be coded over multiple bytes under UTF-8 systems.

c) Frame format

Mod Type (3 char)	Serial Number (6 char hexadecimal)	- (1 char)	Output Number (1 char)	Additional parameters
----------------------	---------------------------------------	---------------	---------------------------	--------------------------

d) Additional Parameters

A parameter always start with the character '%' (reserved char)

- '%Dxxx' decimal dimmer/volume value assignment
- '%DB' and '%DE' : execute a Start/Stop dim on a dimmer output
- '%I%Dxxx' and '%O%Dxxx' Increase and Decrease dimmer/volume value by step of decimal 'xxx' percent
- '%Txx.x' decimal T° value (set Heating setpoint)
- '%Uxx.x' decimal T° value (set Cooling setpoint)
- '%Ax' Sound Auxiliary selection 1=>4, Tuner = 5
- '%Fxxx,xxxx' decimal Tuner Frequency in Mhz
- '%I' set the output
- '%O' reset the output
- '%Mx' set Temperature mode (1=absence, 2=auto, 5=confort, 6=gel)
- '%Rx' set Regulation mode (0=off, 1=heating, 2=cooling, 3=mixed)

- '%H' shutter goes High
- '%L' shutter goes Low
- '%S' ask status of module (does not work with MEMO)
- '%Px' simulate a push on an input (1=Begin short push 2=End short push 3=Begin long push 4=End long push)

e) Samples of strings sent to your Domintell installation

Text	Means
BU1 11-1	Change output 1 on module DPBU01 with serial number 0x000011
BU1 11%S	Get Status of input (button) and output (LED's) on module DPBU01 with serial number 0x000011
&BU2 52-2	Change output 2 on module DPBU02 with serial number 0x000052
BU4 4F-4&BU6 8A-6	Change output 4 on module DPBU04 with serial number 0x00004F and Change output 6 on module DPBU06 with serial number 0x00008A
BU2 52-2%P1	Simulate Begin of short push on button 2 of module DPBU02 with serial number 0x000052
BU6 134-1%P2	Simulate End of short push on button 1 of module DPBU06 with serial number 0x000134
IS4 CD-4%P3	Simulate Begin of long push on input 4 of module DISM04 with serial number 0x0000CD
IS8 2D8-7%P4	Simulate End of long push on input 7 of module DISM08 with serial number 0x0002D8
BIR 3A6-8	Change output 8 on module DBIR01 with serial number 0x0003A6
TRV 73-1	Change shutter 1 on module DTRV01 with serial number 0x000073
TRV 73-2%H	Shutter 2 on module DTRV01 with serial number 0x000073 goes High (v1.19.17)
TRV 73-3%L	Shutter 3 on module DTRV01 with serial number 0x000073 goes Low (v1.19.17)
TRV 73-4%O	Stop shutter 4 on module DTRV01 with serial number 0x000073
TRP 151-4	Change output 4 on module DPBU06 with serial number 0x00008A
DIM 19F-8	Change output 8 on module DDIM01 with serial number 0x00019F
DIM 19F-6%D50	Set output 6 to 50% on module DDIM01 with serial number 0x00019F
DIM 19F-6%DB	Start dimming on output 6 on module DDIM01 with serial number 0x00019F (v1.17.02)
DIM 19F-6%DE	Stop dimming on output 6 on module DDIM01 with serial number 0x00019F (v1.17.02)
DIM 19F-6%I%D10	Increase by step of 10% the value on output 6 on module DDIM01 with serial number 0x00019F (stop at 100%) (v1.17.02)
DIM 19F-6%O%D7	Decrease by step of 7% the value on output 6 on module DDIM01 with serial number 0x00019F (stop at 0%) (v1.17.02)
LED C2-1	Change output 1 on module DLED01 with serial number 0x0000C2
VAR 1	Change variable 1
SYS 1	Change system variable 1, inc T° mode
SYS 1%S	Get status of system variable 1
SYS 1%M2	Set system T° mode to AUTO
SYS 2%R1	Set system Regulation mode to HEATING
SYS 2%D00	Set Regulation mode to OFF
SYS 2%D01	Set Regulation mode to Heating
SYS 2%D2	Set Regulation mode to Cooling
SYS 2%D03	Set Regulation mode to Mixed
TPV 3-1	Change shutter 1 on module DTRP02 with serial number 0x000003
D10 1-1	Change output 1 on module DOUT10V01 with serial number 0x000001
D10 1-1%D60	Set output 1 to 60% on module DOUT10V01 with serial number 0x000001
D10 1-1%I%D5	Increase output value of module DOUT10V01 with serial number 0x000001 by step of 5% (v1.17.02)
D10 1-1%O%D11	Decrease output value of module DOUT10V01 with serial number 0x000001 by step of 11% (v1.17.02)
DMX 1F-2-1%X230	Set channel 1 of device 2 to value 230 of module DDMX01 with serial number 0x00001F
V24 1-1	Change shutter 1 on module DTRVBT01 with serial number 0x000001
TSB 8D%T24.5	Set Heating T° to 24,5°C on module DTSC01/03 with serial number 0x00008D
LT2 34%T22.7	Set Heating T° to 22,7°C on module DTSC02 with serial number 0x000034
LT4 2F%U21.5	Set Cooling T° to 21,5°C on module DTSC04 with serial number 0x00002F



T35 12%U24.5	Set Cooling T° to 24,5°C on module DTSC35 with serial number 18
TE2 A%M1	Set T° Mode to Absence on module DTEM02 with serial number 10
TE2 A%R2	Set Regulation Mode to Cooling on module DTEM02 with serial number 10
I10 5%S	Ask Status of the input of DIN10V with serial number 0x000005
AMP 3-1%D50%A1	Output 1 to Aux 1 at Volume 50 on module DAMPLI01 with serial number 0x000003
AMP 3-1%I%D15	Increase volume of Output 1 by step of 15% on module DAMPLI01 with serial number 0x000003 (v1.17.02)
AMP 3-1%O%D9	Decrease volume of Output 1 by step of 9% on module DAMPLI01 with serial number 0x000003 (v1.17.02)
AMP 3-2%D60%F99.1%A5	Output 2 to Tuner at Volume 60 & Freq 99,1MHz on module DAMPLI01 with serial number 0x000003
AMP000003-4	Change output 4 volume on module DAMPLI01 with serial number 0x000003
AMP000003%S	Ask status of all output of module DAMPLI01 with serial number 0x000003
BIR 3A6-6%I	Set output 6 on module DBIR01 with serial number 0x0003A6
BIR 3A6-6%O	Reset output 6 on module DBIR01 with serial number 0x0003A6
MEM000001%I	SET Mixed Memo 1 (v1.16.02)
MEM000001%O	RESET Mixed Memo 1 (v1.16.02)
MEM000002%D50	SET 50% to Dimmer Memo 2 (v1.16.03)
MEM000002%I%D5	Increase value of Dimmer Memo 2 by step of 5% (v1.17.02)
MEM000002%O%D17	Decrease value of Dimmer Memo 2 by step of 17% (v1.17.02)
MEM 3%O	Shutter Memo Group : OFF
MEM 3%H	Shutter Memo Group : UP (High)
MEM 3%L	Shutter Memo Group : Down (Low))
SFE000001	SET Sfeer 1 (v1.16.03)
SFE000001%I	SET Sfeer 1 (v1.16.03)
SFE000001%S	Get status of each item in the Sfeer 1 (v1.17.02)
PBL C-6%I	SET DPBTLCD0x 6 th output
PBL C-1%O	RESET DPBTLCD0x 1 st output
PBL C-1%P2	Simulate begin of short push on button 1 of module DPBTLCD0x with serial number 0x00000C (v1.17.02)
PBL 13%S	Return status (Temp -> only for DPBTLCD02) of module DPBTLCD02 with serial number 0x000013 (v1.17.02)
FAN000001-1%I	Set speed 1
FAN000001-2%I	Set speed 2
FAN000001-3%I	Set speed 3
FAN000001-4%I	Set Heating (if speed different of 0) Advise : change T° sensor setpoint!
FAN000001-5%I	Set Cooling (if speed different of 0) Advise : change T° sensor setpoint!
FAN000001-6%I	Set Manual mode
FAN000001-6%O	Set Automatic mode
DMV00001-1%I	Set speed 1
DMV00001-2%I	Set speed 2
DMV00001-3%I	Set speed 3
DMV00001-4%I	Set Auxiliary 1
DMV00001-5%I	Set Auxiliary 2
ZON000001%I	T° Zone 1, increment setpoint. (T° zones since v1.17.00)
ZON000001%O	T° Zone 1, decrement setpoint.
ZON000001%T15.5	T° Zone 1, setpoint to 15.5°C.
ZON000001%M1	T° Zone 1, set T° mode to absence.
ZON000001%M2	T° Zone 1, set T° mode to automatic.
ZON000001%M5	T° Zone 1, set T° mode to comfort.
ZON000001%M6	T° Zone 1, set T° mode to frost (if frost mode enabled).
CLK000001%K00:22:00 7F 00/05/09	Set Clock 1 at 00h22m00s for all weekdays during month of may (v1.17.02)
CLK000001%K00:22:00 FF 00/05/09	Disable Clock 1 and set datas to 00h22m00s for all weekdays during month of may



	(v1.17.02)
CLK000001%K01:22:00 08 00/00/00	Set Clock 1 at 01h22m00s each Wednesday (v1.17.02)

3.2. Output Light Protocol (Domintell system to third-party software)

a) Frame description

Mod Type (3 char)	Serial Number (6 char hexadecimal)	Data Type (1 char)	Datas (n * 2 char hexa)	<CR><LF>
----------------------	---------------------------------------	-----------------------	----------------------------	----------

b) Module Types

<u>Reference</u>	<u>Mod Type</u>	<u>Description</u>	<u>Possible output data type</u>
DAMPLI01	AMP	Sound Module	S
DBIR01	BIR	8 bipolar relays	O
DDIM01	DIM	8 dimmer commands	D
DDIR01	DIR	IR detector	C
DMV01	DMV	Mechanical ventilation	O
DDMX01	DMX	DMX Module	X
DETH02	ET2	Ethernet Light Protocol module	None (only in APPINFO – version in hexadecimal)
DFAN01	FAN	Fan controller	O for security reasons, valves always follow the setpoint regulation, so if you need to toggle the valves of the DFAN01, you must first change the setpoint on the associated sensor. If valves are OFF, fan will not start. 6th DFAN01 output is the working mode : 0 = auto, 1 = manual.
DIN10V01	I10	Analog 0-10V input module	D
DISM04	IS4	4 Inputs module	I
DISM08	IS8	8 Inputs module	I
DLCD01	LCD	4*20 char LCD with 2 inputs	I
DLCD03	LC3	Multifunction LCD	I,O,T,U,M,R
DLED01	LED	4 leds driver	O
DMOV01	DET	Infrared detector	I
DMR01	DMR	5 Monopolar relays	O
DOUT10V01	D10	0/1-10V dimmer module	D
DPB(U/T)01	BU1	1 Push Button	I,O
DPB(U/T)02	BU2	2 Push Button	I,O
DPB(U/T)04	BU4	4 Push Button	I,O
DPB(U/T)06	BU6	6 Push Button	I,O
DPBTLCD0x	PBL	LCD push buttons	B,O,T,U,M,R (T,U,M,R = DPBTLCD02 only)
DRS23202	RS2	Serial Light Protocol module	None (only in APPINFO – version in hexadecimal)
DTEM01	TE1	Temperature sensor	T,U,M,R
DTEM02	TE2	Temperature sensor with 2*16 char LCD	T,U,M,R
DTRP01	TRP	4 telerruptors	O
DTRP02	TPV	2 shutter command with telerruptors Bit 0 Relay 1 = UP Bit 1 Relay 1 = DOWN ...	O (since card's soft version 3)

DTRV01	TRV	4 shutter inverters Bit 0 Relay 1 = UP Bit 1 Relay 1 = DOWN ...	O
DTRVBT01	V24	1 DC shutter command Bit 0 = UP – Bit 1 = DOWN	O (Low voltage TRV – 1 out – available soon)
DTSC01/03	TSB	Touchscreen	I,T,U,M,R
DTSC02	LT2	TFT Touchscreen	I,T,U,M,R
DTSC04	LT4	TFT Touchscreen with video	I,T,U,M,R
DTSC35	T35	3,5 TFT Touchscreen	I,T,U,M,R
DVIP01/02	CAM	Cameras informations	
Clocks	CLK	Programmes clock (normal, reset and astronomical)	K
Radio Station	STA	Radio Station name & frequency	
Software Vars	VAR	Virtual programmed status	O,D,M,R (serial = number in order of appearance on the configuration screen) So you'll be able to create different events.
System Vars	SYS	System status	O (Since v1.12.01 & higher)
Temp. Plage List	TPL	Specific range of a Temp. profile	P
Temp. Profile	TPR	Profile's name which contains next Temp. plage lists received	

c) Data Types

<u>Char</u>	<u>Means</u>	<u>Description (some '0' can be replaced by ' ' (space))</u>
'T'	Inputs	LSB = input 0, MSB = input 7
'O'	Outputs	LSB = output 0, MSB = output 7
'D'	Dimmers	2 first bytes = first output (%) Example : '64' = 100%
'X'	DMX	2 first bytes = first channel Example : 'C0' = 192
'T'	Temperature Heating setpoint	Example : '20.5 22.0 AUTO 18.0' 1 st T° = measure (with software offset) 2 nd T° = Heating setpoint value Sensor T° Mode 3 rd T° = Heating profile value
'U'	Temperature Cooling setpoint	Example : '20.5 22.0 HEATING 18.0' 1 st T° = measure (with software offset) 2 nd T° = cooling setpoint value Sensor Regulation Mode 3 rd T° = cooling profile value
'C'	Infrared Command	Example : Key 1 = '01'
'S'	Sound	'1-32-TUNE-63-03E8' = Output 1 – 50% - Source Tuner – 99,1000 Mhz (Since card version 5)
'B'	Button	2 bytes(button number) + 2 bytes (00=released 01=pressed)
'P'	Temp. Plage	Example : 12:32:00 21.6 1 st = hh:mm:ss 2 nd = setpoint value
'K'	Clocks	Example : 00:38:00 7F 00/01/04 Clock 1 st = hh:mm:ss 2 nd = Day mask (b0=sunday, b1=monday, ... b7= disable clock (=1)) 3 rd = Name 4 th = Type of clock : blank (normal), SUNSET, SUNRISE, RESET

d) Sample of received strings

<u>Text</u>	<u>Means</u>
PONG	answer from DRS23202/DETH02 after a string "PING"
MOD_VERSION=SER_V0A	answer from DRS23202 after a string "MOD_VERSION" (hexa)
MOD_VERSION=ETH_V01_STK_V01	answer from DETH02 after a string "MOD_VERSION" (hexa)
TE1 6CT25.2 21.0 AUTO 19.5	Heating T° infos of DTEM01 with serial number 0x6C
TE1 6CU25.2 21.0 HEATING 19.5	Cooling T° infos of DTEM01 with serial number 0x6C
TE2 58T20.9 21.0 COMFORT 21.0	Heating T° infos of DTEM02 with serial number 0x58
TE2 58U20.9 28.0 MIXED 28.0	Cooling T° infos of DTEM02 with serial number 0x58
BU1 11O00	Outputs OFF on module DPBU01 with serial number 0x000011
BU2 52O01	led 1 ON on module DPBU02 with serial number 0x000052
BU4 4FO00	Outputs OFF on module DPBU04 with serial number 0x00004F
BU6 8AO00	Outputs OFF on module DPBU06 with serial number 0x00008A
BIR 3A6O00	Outputs OFF on module DBIR01 with serial number 0x0003A6
TRV 73O00	Outputs OFF on module DTRV01 with serial number 0x000073
TRP 151O00	Outputs OFF on module DTRP01 with serial number 0x000151
DIM 19FD 064 0 0 0 0 0 0	Dim 2 = 100% on module DDIM01 with serial number 0x00019F
LED C2O00	Outputs OFF on module DLED01 with serial number 0x0000C2
IS4 7I00	Inputs OFF on module DISM04 with serial number 0x000007
IS8 4F8I10	Key 4 ON on module DISM08 with serial number 0x0004F8
BU1 11I00	Inputs OFF on module DPBU01 with serial number 0x000011
BU2 52I00	Inputs OFF on module DPBU02 with serial number 0x000052
BU4 4FI00	Inputs OFF on module DPBU04 with serial number 0x00004F
BU6 8AI00	Inputs OFF on module DPBU06 with serial number 0x00008A
LCD 25I00	Inputs OFF on module DLCD01 with serial number 0x000025
VAR 1O01	Variable 1 True
VAR000001O00	Variable 1 False
VAR 1D64	Variable 1 100%
SYS 2O01	System Variable 2 has value 1
TPV 3O01	shutter 1 : UP on module DTRP02 with serial number 0x000003
D10 1D32	50% on module DOUT10V01 with serial number 0x000001
V24 1O01	shutter 1 : UP on module DTRVBT01 with serial number 0x000001
PBL CO00	Outputs OFF on module DPBTLCD0x with serial number 0x00000C
PBL CT24.0 18.0 AUTO 12.0	Temperature on module DPBTLCD02 with serial number 0x00000C
PBL CB0101	Push Button 1 on DPBTLCD with serial number 0x00000C
PBL CB0100	Release Button 1 on DPBTLCD with serial number 0x00000C
PBL CO00	DPBLCD0xwith serial number 0x00000C outputs are OFF
PBL CO02	2 nd DPBLCD0xwith serial number 0x00000C output is ON
AMP 3S1-1D-TUNE-6A-0FA0	Output 1, 29%, Tuner, 106.4000MHz on DAMPLI01 with serial 0x03
AMP 3S3-32-AUX1-64-0000	Output 3, 50%, Aux 1, 100.0000MHz on DAMPLI01 with serial 0x03
FAN000001O20	DFAN01 module with serial number 0x000001 is OFF, manual mode
FAN000001O11	DFAN01 with serial number 0x01 is cooling @ speed 1, auto mode
FAN000001O0C	DFAN01 with serial number 0x01 is heating @ speed 3, auto mode
FAN000001O32	DFAN01 with serial number 0x01 is cooling @ speed 2, manual mode
DMV000001O01	DMV01 with serial number 0x01 has speed 1 enabled
DMV000001O0A	DMV01 with serial number 0x01 has speed 2 and auxiliary 1 output enabled
DMV000001O1A	DMV01 with serial number 0x01 has speed 2 and auxiliary 1 and 2 output enabled
I10000005D32	Input = 50% on DIN10V02 with serial number 0x000005
DMX 1F-2-00EB000000000000 DMX 1F-2X00EB000000000000	String with 2 nd '.' is obsolete since v11(DETH02) & v16(DRS23202) Device 2 connected to DDMX01 module with serial number 0x00001F has its 2 nd channel set to 234
CLK 2K08:05:00-7F-00/00/00-Clock[SUNRISE]	Clock 2 is an astronomical sunrise clock set (this week) to 8h05m00s all weekdays
TPR 2Range N°2	Profile 2 is named 'Range N°2'
TPL 8P15.5-02:45:00	Setpoint of Range 8 will be 15.5°C from 2h45m00s



STA 1STU BRU[FM=64-1770]	Station 1 « STU BRU » @ FM 100,6000MHz
!! PLEASE UPGRADE DETH02 FIRMWARE	This string means that DETH02 has an incompatible version regarding the current OS version in the Master/DGQG01. Bad/missing information can be sent by DETH02 until its firmware is updated.

e) Example of received strings after APPINFO :

```
!! PLEASE UPGRADE DRS23202 FIRMWARE >= 18 !!
!! PLEASE UPGRADE DETH02 FIRMWARE >= 17 !!
APPINFO (PROG M 1.21 13/11/13 14h52 Rev=0) => TEST_APPINFO.dap :
RS2      2[VERS=0x10]Interface protocole RS[House|]
ET2      B6[VERS=0x0B]MOD DETH02[House|]
BIR      4C9-1BIR 1[House|1st floor|living]
BIR      4C9-2BIR 2[House|1st floor|living]
BIR      4C9-3BIR 3[House|1st floor|kitchen]
BIR      4C9-4BIR 4[House|1st floor|kitchen]
BIR      4C9-5BIR 5[House|2nd floor|]
BIR      4C9-6BIR 6[House|]
BIR      4C9-7BIR 7[House|]
BIR      4C9-8BIR 8[House|]
TRV      3E9-1TRV 1[House|]
TRV      3E9-3TRV 2[House|]
TRV      3E9-5TRV 3[House|]
TRV      3E9-7TRV 4[House|]
DMV      1-10Output DMV01[House|]
DMV      1-10Output DMV01 2[House|]
DMV      1-10Output DMV01 3[House|]
DMV      1-1Auxiliary 1[House|]
DMV      1-1Auxiliary 2[House|]
PBL      E6C-1Input PB 1[House|][NOLINK]
PBL      E6C-2Input PB 2[House|][NOLINK]
PBL      E6C-3Input PB 3[House|][NOLINK]
PBL      E6C-4Input PB 4[House|][NOLINK]
PBL      E6C-7T° sensor DPBTLCD0x[House|]
PBL      E6C-8Led PB 1[House|]
PBL      E6C-9Led PB 2[House|]
PBL      E6C-ALED PB 3[House|]
PBL      E6C-BLED PB 4[House|]
LT4      1-5T° sensor DTSC04[House|]
LT4      1-6IR sensor DTSC04[House|]
LT4      1-BOutput DTSC04 1[House|]
LT4      1-COutput DTSC04 2[House|]
LT4      1-DOutput DTSC04 3[House|]
LT4      1-EOutput DTSC04 4[House|]
LT4      1-15Lock[House|]
BU6      24B-1Input B6 1[House|][PUSH=LONG]
BU6      24B-2Input B6 2[House|][PUSH=LONG]
BU6      24B-3Input B6 3[House|][NOLINK]
BU6      24B-3Input B6 3[House|][NOLINK]
BU6      24B-4Input B6 4[House|][PUSH=SHORT]
BU6      24B-5Input B6 5[House|][PUSH=SHORT]
BU6      24B-6Input B6 6[House|][NOLINK]
BU6      24B-7LED B6 1[House|]
BU6      24B-8LED B6 2[House|]
BU6      24B-9LED B6 3[House|]
BU6      24B-ALED B6 4[House|]
BU6      24B-BLED B6 5[House|]
BU6      24B-CLED B6 6[House|]
DIM      21B-1DIM 1[House|]
DIM      21B-2DIM 2[House|]
DIM      21B-3DIM 3[House|]
DIM      21B-4DIM 4[House|]
DIM      21B-5DIM 5[House|]
```




DIM 21B-6DIM 6[House| |]
DIM 21B-7DIM 7[House| |]
DIM 21B-8DIM 8[House| |]
TSB 236-5T° sensor Touch[House| |]
TSB 236-6IR sensor Touch[House| |]
TRP 691-1TRP 1[House| |]
TRP 691-2TRP 2[House| |]
TRP 691-3TRP 3[House| |]
TRP 691-4TRP 4[House| |]
BU2 9-1Input B2 1[House| |][PUSH=SHORT]
BU2 9-2Input B2 2[House| |][NOLINK]
BU2 9-3LED B2 1[House| |]
BU2 9-4LED B2 2[House| |]
TE1 9DE-1T° sensor T1[House| |]
V24 A-1TRV BT[House| |]
I10 5-1Input 0-10V [House| |]
AMP 105-1HP 1[House| |]
AMP 105-2HP 2[House| |]
AMP 105-3HP 3[House| |]
AMP 105-4HP 4[House| |]
FAN 267-1DFAN[House| |]
FAN 268-1DFAN[House| |]
DMR 3-1DMR 1[House| |]
DMR 3-2DMR 2[House| |]
DMR 3-3DMR 3[House| |]
DMR 3-4DMR 4[House| |]
DMR 3-5DMR 5[House| |]
DMX 91-1DMX Output 1 RGBI[House| |][4 CHANNELS]
DMX 91-1-CH1:Chan. R[R 0x00-0xFF]
DMX 91-1-CH2:Label G[G 0x00-0xFF]
DMX 91-1-CH3:Chan. B[B 0x00-0xFF]
DMX 91-1-CH4:Chan. I[I 0x00-0x64]
DMX 91-2DMX Output 2 II[House| |][2 CHANNELS]
DMX 91-2-CH1:Chan. 1[I 0x00-0xFF]
DMX 91-2-CH2:Chan. 2[I 0x00-0xFF]
DMX 91-3DMX Output 3 I[House| |][1 CHANNELS]
DMX 91-3-CH1:Chan. 1[I 0x00-0xFF]
VAR 1My variable[House|Floor|Room][BOOL]
VAR 2My variable 2[House|Floor|Room][VALU,00->100,LOOP]
SYS 0Presence simulation[House| |][BOOL]
SYS 1T° mode[House| |][VALU,1-2-5-6,LOOP]
SYS 2Regulation mode[House| |][VALU,00->03,LOOP]
SYS 9Day[House| |][BOOL][READONLY]
MEM 1Memo 1[House| |][MIX][REF=BIR 4C9-1]
MEM 2Memo 2[House| |][SHUTTERS][REF=TRV 3E9-1]
MEM 3Memo 3[House| |][DIMMERS][REF=DIM 21B-1]
MEM 4Memo 4[House| |][SOUND][REF=AMP 105-1]
MEM 5Memo 5[House| |][FAN][REF=FAN 267-1]
SFE 1Sfeer 1-Scene 1[House| |]
SFE 2Sfeer 1-Scene 2[House| |]
ZON 1Zone 1[House| |]
CLK 1K00:38:00-7F-04/01/00-Clock
CLK 2K08:05:00-7F-00/00/00-Clock[SUNRISE]
CLK 3K00:00:00-7F-00/00/00-Clock[RESET]
CLK 4K18:02:00-7F-00/00/00-Clock[SUNSET]
TPR 1Range N°1
TPL 0P12.0-00:00:00
TPL 1P26.5-05:00:00
TPL 2P12.0-07:00:00
TPL 3P 5.0-13:45:00
TPL 4P12.0-15:45:00
TPL 5P20.0-20:15:00



```
TPL      6P12.0-22:15:00
TPR      2Range N°2
TPL      7P12.0-00:00:00
TPL      8P15.5-02:45:00
TPL      9P12.0-04:45:00
TPL      AP26.0-08:30:00
TPL      BP12.0-10:30:00
TPL      CP30.0-16:30:00
TPL      DP12.0-18:30:00
STA      1STU BRU[FM=64-1770]
STA      2PURE FM[FM=60-1770]
CAM      1Axis Cam01[AXIS][IP=192.168.0.2]
CAM      2Cam DVIP01[DVIP][DHCP][IP=192.168.0.3]
[JPG=http://192.168.0.3:80/jpg/image.jpg]
CAM      3Cam DVIP02[DVIP][IP=192.168.0.4]
[JPG=http://192.168.0.4:80/jpg/image.jpg]
END APPINFO - Send "HELP" from ETH.
Datasheet @ www.domintell.com => Pro - support.domintell@trump.be
```

3.3. Input ASCII strings (sent to Domintell system).

You can create «string» links on outputs (dimmer, relay). When this string will be sent to Domintell2 system, the programmed action on the output will be performed.

3.4. Output ASCII strings (sent to your device).

If the correspondent event occurs on the programmed input (like push button, motion detector, water overflow sensor, ...), the text is sent to the module.

4. How to use DETH02 with your own application

4.1. Initiate communication with DETH02

!! You have to wait at least one reply before sending the next command otherwise new commands will be dropped. Specific DETH0x commands can NOT be concatenated using "&" as it can be done with LightProtocol messages. Only one DETH0x command can be sent by UDP frame. Depending of frame length and bus/network load, reply will be sent from 5ms to 100ms.

'>' means sent to DETH02 and '<' means received from DETH02.

a) Open a session

First check that you are talking to a DETH02

> MOD_VERSION

< MOD_VERSION=ETH02_V14-STK_V0F

Then open a session (if a password is set please refer to 4.2 Login with Password and send string return by libdeth library).

> LOGIN

< INFO:Session opened:INFO

b) Download list of modules

> APPINFO

< !! PLEASE UPGRADE DRS23202 FIRMWARE >= 18 !!

< APPINFO (PROG M 1.24 16/06/14 09h44 Rev=0) => TRUMP_v12400_v02.dap :

< FRO 1 : 1

< ET2 1[VERS=0x14]MOD DETH02[Maison|]

< ...

< END APPINFO - Send "HELP" from ETH.

< Datasheet @ www.domintell.com => Pro - support.domintell@trump.be

If red message is also received, you have to inform the customer that the DETH02 module must be updated (by contacting technical support of Domintell) and also inform that some functionalities may not work correctly.

c) Keep session open

To keep session opened, you have to send one command (or LightProtocol string) to DETH02. The best way is to use HELLO command. PING command should be avoided to keep a session opened as it will generate a lot of traffic on Domintell Bus and takes resources in Master (DGQG01).

> HELLO

< INFO:World:INFO

d) Refresh statuses

As said above, PING command must be used carefully. Generally, use it after a LOGIN (if your application has already been configured using APPINFO).

> PING

< ...

There is no string/flags to notify end of list of statuses.

e) Close session before exiting the application

If your application is closed or background, it is better to send the LOGOUT command to allow other applications/devices to use DETH02.

> LOGOUT

< INFO:Session closed:INFO

4.2. Login with Password

The SDK package can be downloaded on the Domintell support website.

!! Please use version 2.0.0 or higher (Binary file in version 2.0.0 is not compatible with version 1.0.0 - even if functions' prototypes have not changed. Sources of your software must be compiled with the new SDK package before using libdeth in version 2).

a) Library installation

● **Linux**

```
$ tar -jxvf libdeth-2.0.0.tar.bz2
$ cd libdeth-1.1.0/linux
$ su -c "./install-lib.sh"
```

This script will copy the library (libdeth-2.0.0.so) in /usr/lib, create several symbolic links and run ldconfig. It will also copy libdeth header file (libdeth.h) in /usr/include.

Then to compile a program with the library :

```
$ gcc -ldeth -o myprog myprog.c
```

If the header file or the library is not found (because library or include path are not set), try :

```
$ gcc -I/usr/include -L/usr/lib -ldeth -o myprog myprog.c
```

● **Windows**

* Just copy *libdeth.dll* from win directory to *c:\winnt\system32* or *c:\windows\system32*

* Copy *libdeth.a* to the linker directory of your compiler. If you are using, Code::Blocks, put it in : *C:\Program Files\CodeBlocks\lib*

* Copy *libdeth.h* to the include directory of your compiler. If you are using, Code::Blocks, put it in : *C:\Program Files\CodeBlocks\include*

In Code::Blocks, you have to link your project with the DETH library go to menu "Project->Build Options" and add in linker tab, the file *libdeth.a* (located in *C:\Program Files\CodeBlocks\lib*)

b) Library summary

Here are prototypes of functions available :

```
extern int deth_getplatform(char * destbuffer, unsigned short buffsize);
```

Return the platform you are using

```
extern int deth_getlibver(char * destbuffer, unsigned short buffsize);
```

Return the library version

```
extern int deth_encryptpsw(char * destbuffer, unsigned short buffsize,
char * password);
```

Encrypt password to store it in destbuffer

c) Function explanation

● **deth_getplatform**

int deth_getplatform(char * destbuffer, unsigned short buffsize)	
version	>= 1.0
destbuffer	buffer that will contain the returned null-terminated string (must be initialized before calling the function)
buffsize	number of byte that the function can write in destbuffer
returned value	number of bytes written in destbuffer (null-character not incl.). '-1' if error
output example	"Built for Linux"

● **deth_getlibver**

int deth_getlibver(char * destbuffer, unsigned short buffsize)
--

version	>= 1.0
destbuffer	buffer that will contain the returned null-terminated string (must be initialized before calling the function)
buffsize	number of byte that the function can write in destbuffer
returned value	number of bytes written in destbuffer (null-character not incl.). '-1' if error
output example	"libdeth - Version 1.0.0 - 2008/04/29 - CARLIER Gaetan - (c) 2008 Trump s.a."

- deth_encryptpsw

int deth_encryptpsw(char * destbuffer, unsigned short buffsize, char * password)	
version	>= 1.0
destbuffer	buffer that will contain the returned null-terminated string (must be initialized before calling the function) !!! destbuffer can contain some null characters. Always use a memcpy function with returned value to manipulate the result stored in destbuffer
buffsize	number of byte that the function can write in destbuffer
password	Null-terminated ASCII string to encrypt. Min 4 characters and max 10 characters (null-character not incl.). "LOGIN" will be automatically append.
returned value	number of bytes written in destbuffer (null-character not incl.). '-1' if error
output example	"LOGINİİ#İÇ`BÊ\BÍVÎİ#ÎÊ"

d) Functions declaration for several programming environment

Example codes are included in SDK package :

- C (Windows and Linux)

```
#ifndef _LIBDETH_H
#define _LIBDETH_H

//#####
//# platform DEPENDANT declaration
//#####

#if defined(WIN32) || defined(WIN64)
#include "windows.h"
#define export __declspec(dllexport)
#elif defined(linux) || defined(_linux_)

#endif

//#####
//# prototype declaration
//#####

#if defined(WIN32) || defined(WIN64)
//This header file is not used by client applications under Windows
extern export short __stdcall deth_getplatform(char * destbuffer, unsigned short buffsize);
extern export short __stdcall deth_getlibver(char * destbuffer, unsigned short buffsize);
extern export short __stdcall deth_encryptpsw(char * destbuffer, unsigned short buffsize, char * password);
#else
extern short deth_getplatform(char * destbuffer, unsigned short buffsize);
extern short deth_getlibver(char * destbuffer, unsigned short buffsize);
extern short deth_encryptpsw(char * destbuffer, unsigned short buffsize, char * password);
#endif

#endif
```

- VB6

```
Private Declare Function deth_getlibver Lib "libdeth.dll" _
    (ByVal buffer As String, ByVal bufsize As Integer) _
    As Integer
Private Declare Function deth_getplatform Lib "libdeth.dll" _
    (ByVal buffer As String, ByVal bufsize As Integer) _
    As Integer
Private Declare Function deth_encryptpsw Lib "libdeth.dll" _
    (ByVal buffer As String, ByVal bufsize As Integer, ByVal mypsw As String) _
    As Integer
```

!!! Always refer to libdeth.def to adjust "Aliases" function name

- Borland C++ Builder

No .lib file is needed to use the DLL with Borland C++ Builder. So, you have to declare the prototype of functions according the header file (libdeth.h).

* In Unit1.h (as global variable):

```
// Define prototypes
typedef short (__stdcall * DETH_GETLIBVER)(char * destbuffer, unsigned short bufsize);
typedef int (__stdcall * DETH_GETPLATFORM)(char * destbuffer, unsigned short bufsize);
typedef int (__stdcall * DETH_ENCRYPTPSW)(char * destbuffer, unsigned short bufsize, char * password);

// Associate prototype to pointer (not yet linked with the DLL)
DETH_GETLIBVER deth_getlibver;
DETH_GETPLATFORM deth_getplatform;
DETH_ENCRYPTPSW deth_encryptpsw;
HINSTANCE hDethDLL;
```

* in "TForm1::FormCreate" procedure :

```
// Load DLL in memory
hDethDLL = LoadLibrary("libdeth.dll" );
// link pointer to entrypoint in DLL
deth_getlibver = (DETH_GETLIBVER)GetProcAddress(hDethDLL, "deth_getlibver" );
deth_getplatform = (DETH_GETPLATFORM)GetProcAddress(hDethDLL, "deth_getplatform" );
deth_encryptpsw = (DETH_ENCRYPTPSW)GetProcAddress(hDethDLL, "deth_encryptpsw" );
```

* free memory :

```
// break link
free(deth_getlibver);
free(deth_getplatform);
free(deth_encryptpsw);
// Release DLL handle
FreeLibrary(hDethDLL);
```