GROUPE SOCOMEC
Interrupteurs industriels et Onduleurs

TECHNICAL GUIDE
DIRIS A40/A41

SUMMARY

CHAPTER 1: PULSE OUTPUTS MODULE

The DIRIS A can be equipped with 2 pulse outputs modules easily affected to active energy in kWh (EA±), reactive in kvarh (ER±) and apparent in kVAh (ES).
The pulse outputs are configurable, with a rate of pulses of 0,1k; 1k; 10k; 100k or 1000k, and a pulse duration from 100 ms to 900 ms.

1.1 - Application:

Visualisation of positive active energy meter kWh (EA+) with PLC.
It is recommended not to exceed 1 pulse per second.

Example 1: Instantaneous power displayed by the DIRIS: 105kW

Calculation of the minimum pulse rate:

- 105 000 W / 3600 s = 29,17W/s
  In this case a pulse weight of 100 Wh can be chosen.

DIRIS configuration (see instruction manual: 876 584 or 876 585):

- Pulse output type : OUT 1 TYPE = EA+ (positive active energy)
- Pulses weight = Out 1 VAL = 0,1 (0,1 kWh)
- Pulses duration = Out 1 DUR = 100 (100 ms)

Example 2 : Instantaneous power displayed by the DIRIS: 1895 kW

Calculation of the minimum pulse rate:

- 1 895 000W / 3600s = 526.3W/s
  In that example, a pulse weigh of 100Wh would be too low (that would mean 5 to 6 impulses per second) it is necessary to program a pulse weigh of 1kWh.

DIRIS configuration (see instruction manual: 876 584 or 876 585):

- Pulse output allocation : OuT 1 TYPE = EA+ (positive active energy)
- Pulses weight = Out 1 VAL = 1 (1kWh)
- Pulses duration = Out 1 DUR = 100 (100ms)

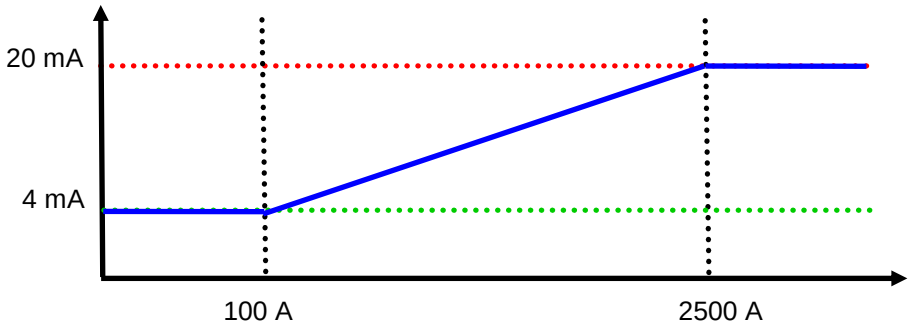
CHAPTER 2: 2 ANALOG OUTPUTS MODULE

The DIRIS A can be fitted with 1 or 2 analogue (0/4–20mA) outputs module. Each module has 2 analogue outputs.

Each output can be assigned to the following values: 3I, In, 3U, 3V, F, ΣP±, ΣQ±, ΣS, $\Sigma PF^{L/C}$.
On each output, it is possible to configure the value for 0, 4 and 20mA.

2.1- Application:

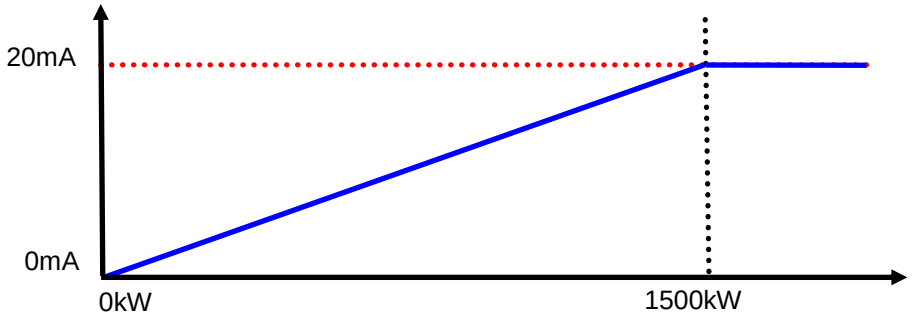
***Example 1*: Configuration of output 1 on current I1 with 100A at 4mA and 2500A at 20mA.**



DIRIS configuration (see instruction manual : 876 586):

- Analogue output type = Out 1 20mA TYPE = 4/20 (4 to 20mA)
- Analogue output allocation = Out 1 20mA PAR = I1 (current phase 1)
- Value at 4mA = Out 1 20mA LV = 0100 / A (100A)
- Value at 20mA = Out 1 20mA HV = 2500 / A (2500A)

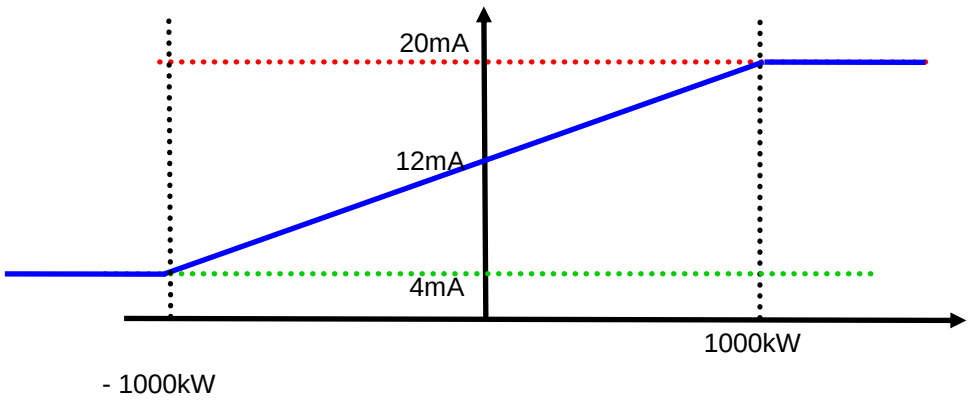
***Example 2*: Configuration of output 2 on total active power ΣP with 0kW at 0mA and 1500kW at 20mA.**



DIRIS configuration (see instruction manual : 876 586):

- Analogue output type = Out 2 20mA TYPE = 0/20 (0 to 20mA)
- Analogue output allocation = Out 2 20mA PAR = ΣP (total active power)
- Value at 0mA = Out 2 20mA LV = 0000 k W (0kW)
- Value at 20mA = Out 2 20mA HV = 1500 k W (1500kW)

Example 3 *: Configuration of output 2 on total active power ΣP with -1000kW at 4mA and 1000kW at 20mA.*

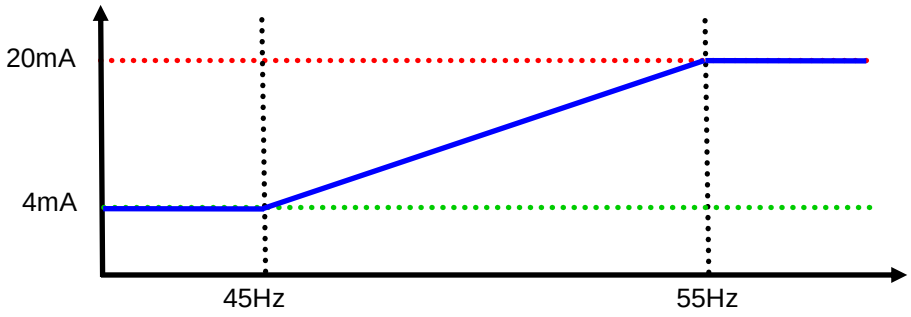


DIRIS configuration (see instruction manual: 876 586):

- Analogue output type = Out 2 20mA TYPE = 4/20 (4 to 20mA)
- Analogue output allocation = Out 2 20mA PAR = ΣP (total active power)
- Value at 4mA = Out 2 20mA LV = 1000 kW (-1000kW)
- Value at 20mA = Out 2 20mA HV = 1000 kW (1000kW)

Note: To use the analogue output with positive **and** negative values at the same time, it is necessary to program identical values for LV and HV.

Example 4: *Configuration of output 3 on frequency F with 45Hz at 4mA and 55Hz at 20mA.*

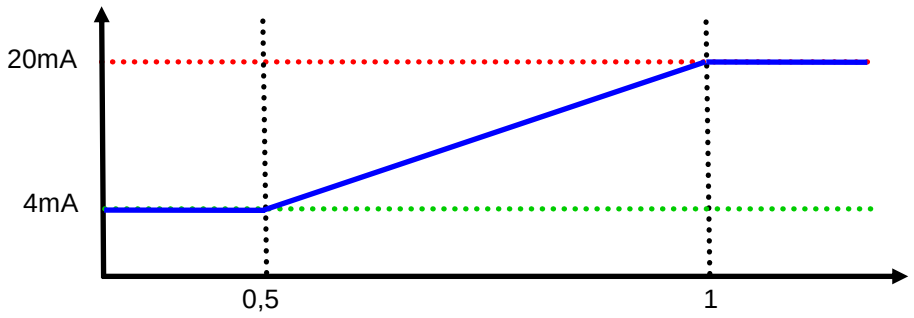


DIRIS configuration (see instruction manual: 876 586):

- Analogue output type = Out 2 20 mA TYPE = 4/20 (4 to 20mA)
- Analogue output allocation = Out 2 20 mA PAR = F (frequency)
- Value at 4 mA = Out 2 20 mA LV = 4500 (45Hz)
- Value at 20 mA = Out 2 20 mA HV = 5500 (55Hz)

Note: For the frequency, the values for 4mA and 20mA must be programmed on 4 digits; therefore, for 45Hz enter the value 4500.

***Example 5*: Configuration of output 4 on inductive power factor ΣPFL with 0,5 for 4mA and 1 for 20mA.**

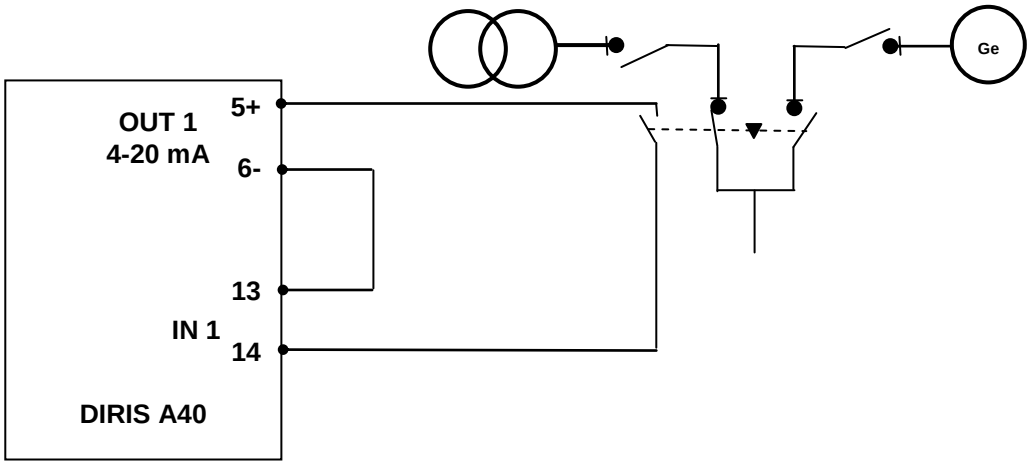


DIRIS configuration (see instruction manual: 876 586):

- Analogue output type = Out 2 20 mA TYPE = 4/20 (4 to 20mA)
- Analogue output allocation = OUt 2 20 mA PAR = ΣPFL (inductive power factor)
- Value at 4mA = Out 2 20 mA LV = 500 (0,5)
- Value at 20mA = Out 2 20 mA HV = 1000 (1)

Note: For the power factor, the values for 4 and 20mA must be programmed on 3 digits; therefore, for 0,5 enter the value 500.

***Example 6*: Configuration of the analogue output 1 to provide a 30VDC optocoupler supply to use with the inputs / outputs module . For example, to count the number of changeover operations or control position (see §3.3)**



DIRIS configuration (see instruction manual : 876 586) :

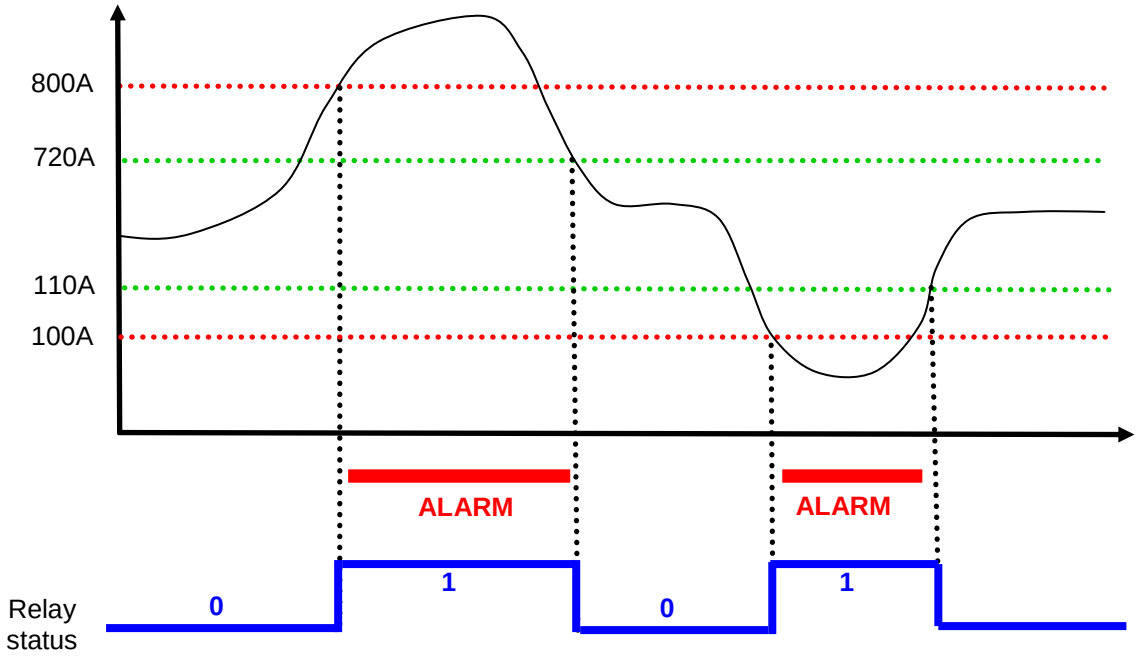
- Analogue output type = Out 1 20mA TYPE = 30 V (30VDC)

CHAPTER 3: 2 INPUTS / 2 OUTPUTS MODULE

The DIRIS A can be fitted with 1,2 or 3 IN/OUT module. Each module has 2 inputs and 2 outputs.
The outputs can be used to monitor electrical values or to command equipments.
The inputs can be used for pulses metering or to control equipments status.

3.1- Output used as monitoring (alarms)

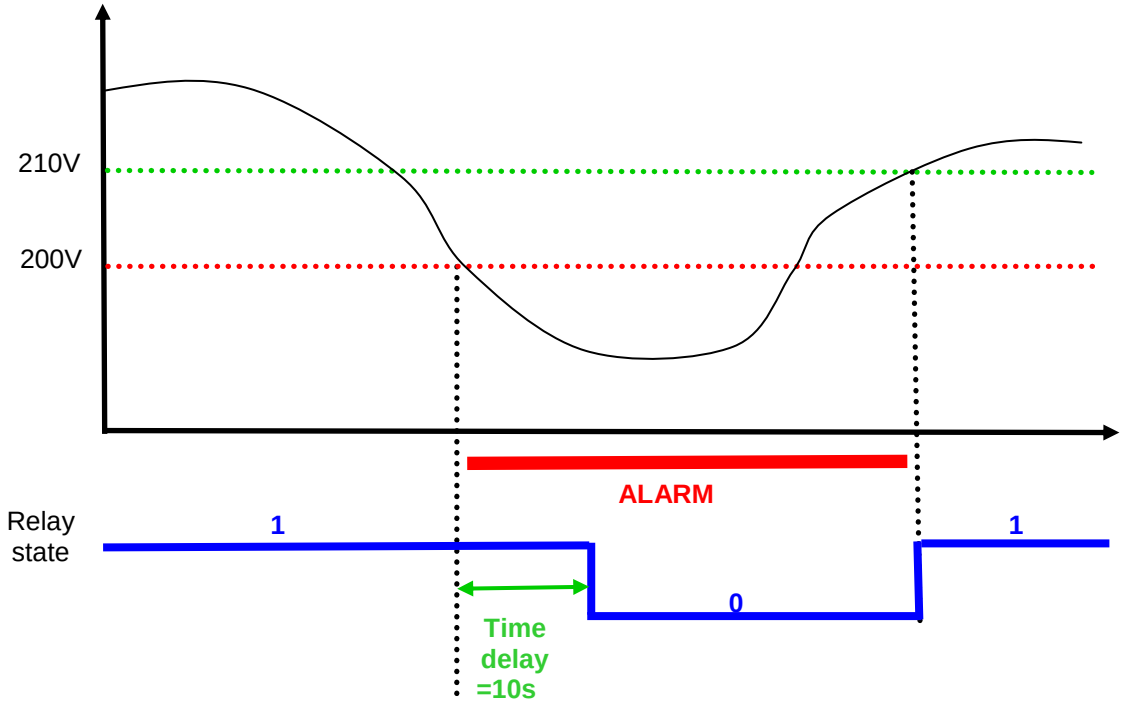
Example 1 : Configuration of relay output N°1 to monitor the currents (3I) with alarm if I<100A or I>800A. Further parameters: 10 % hysteresis, relay status NO and without temporisation.



DIRIS configuration (see instruction manual: 876 587):

- Relay output 1 type = OuT 1 A-Cd TYPE = I (alarm on current)
- Alarm : upper threshold = Out 1 Ht I 0800 / A (800A)
- Alarm : lower threshold = Out 1 Lt I 0100 / A (100A)
- Hysteresis = Out 1 HYST 10 (10%)
- Relay time delay = Out 1 TEMPO 000 (0 second)
- Relay status = Out RELAY NO (Normally Open)

Example 2 : Configuration of relay output N°2 to monitor the phase to neutral voltage with alarm if V<200v, without upper threshold. Further parameters: 5 % hysteresis, relay status NC and 10s temporisation.



DIRIS configuration (see instruction manual: 876 587):

- Relay output 1 type = OuT 2 A-Cd TYPE = V (alarm on voltage)
- Alarm : upper threshold = Out 2 Ht I 0300 / V (300V to make sure that level will never be reached in order to inhibit the upper threshold)
- Alarm : lower threshold = Out 2 Lt I 0200 / V (200V)
- Hysteresis = Out 2 HYST 05 (5%)
- Relay time delay = Out 2 TEMPO 010 (10 seconds)
- Relay status = Out RELAY NC (Normally closed)

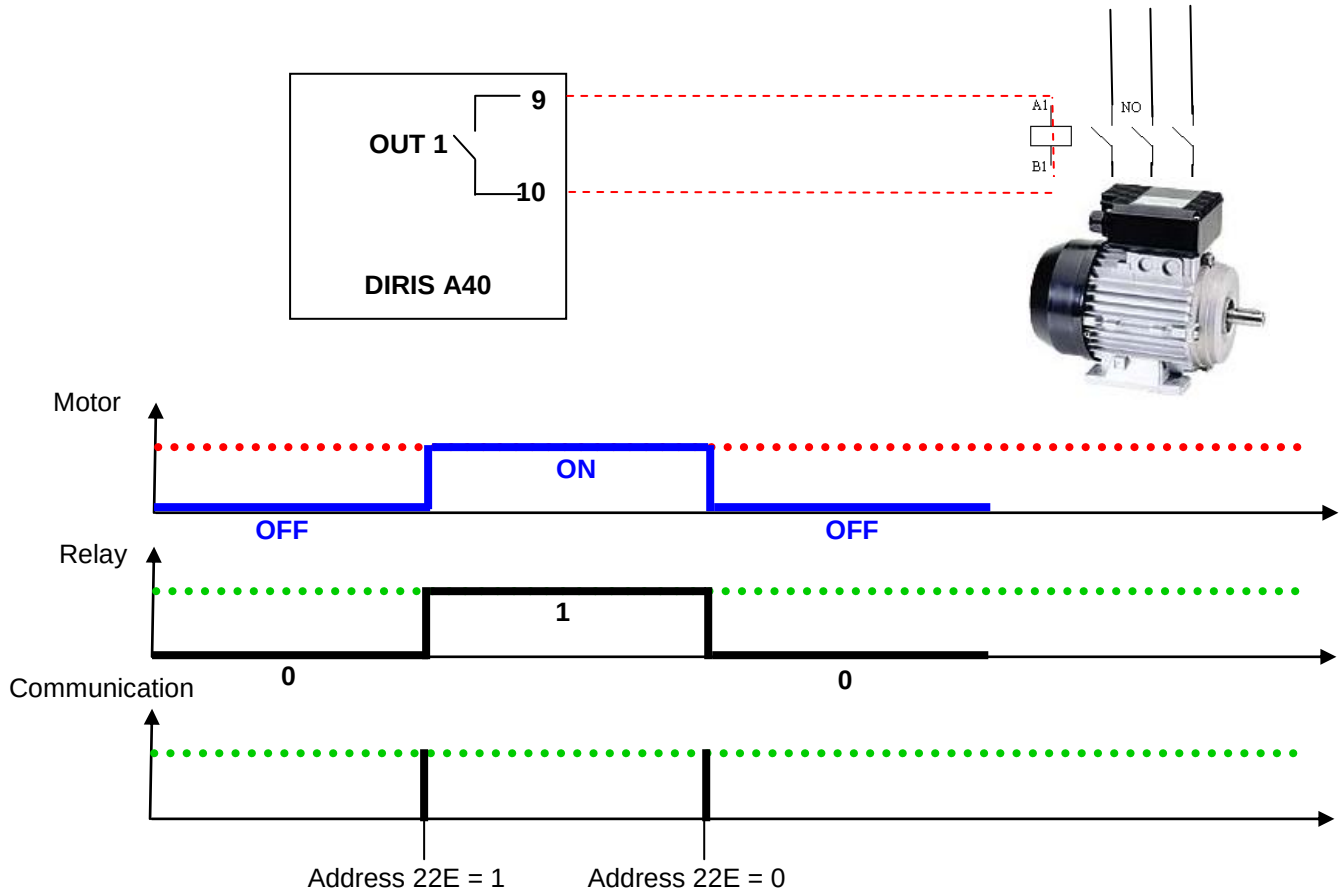
3.2- Outputs used as command

This function is used with RS85 JBUS/MODBUS or PROFIBUS-DP communication module. Through the communication, it is possible to change the status of the Diris outputs.

Example 1: Changing the relay 1 status to start an engine remotely.

DIRIS configuration (see instruction manual: 876 587):

- Relay output 1 type = OuT 1 A-Cd TYPE = CdE (Command)



JBUS/MODBUS frame (see instruction manual : CDR27028)

Changing the relay output N°1(addresses Hex. 22E) closed = 1 and opened = 0

Master frame to close the relay:

Slave	Function	Address High-order	Address High-order	Value High-order	Value Low-order	CRC16
05	06	02	2E	00	01	283F
					Closed start motor	

The response of the DIRIS is identical to the request of the Master

Changing the relay output N°1(addresses Hex. 22E) closed = 1 and opened = 0

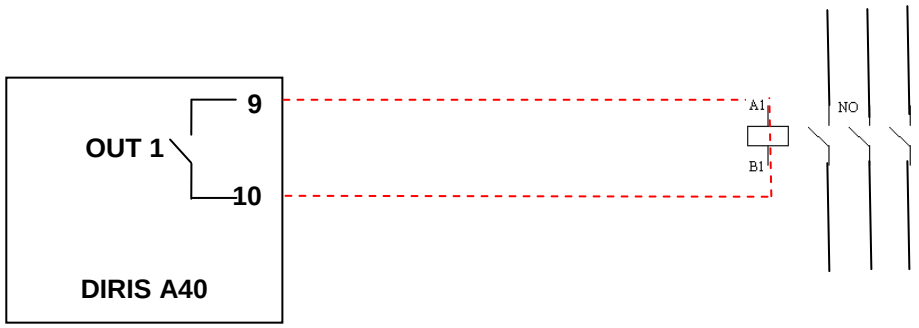
Master frame to open the relay:

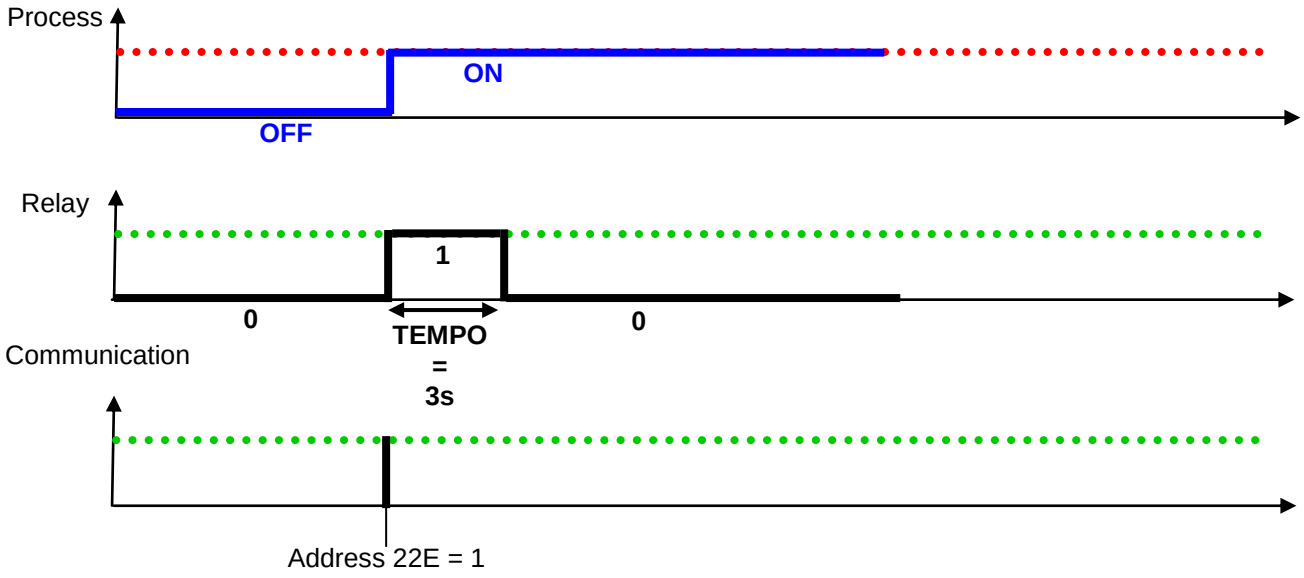
Slave	Function	Address High-order	Address High-order	Value High-order	Value Low-order	CRC16
05	06	02	2E	00	00	E9FF
					Open Stop motor	

Example 2 : Changing the relay 1 status to give a 3 seconds order to initiate a process (same function as a pushbutton). Normally open relay run mode.

DIRIS configuration (see instruction manual: 876 587):

- Relay output 1 type = Out 1 A-Cd TYPE = Cd-t (temporised command)
- Temporisation before return to rest state =Out 1 TEMPO 003 (3 seconds)
- Relay status = Out 1 RELAY NO (Normally open)





JBUS/MODBUS frame (see instruction manual : CDR27028)

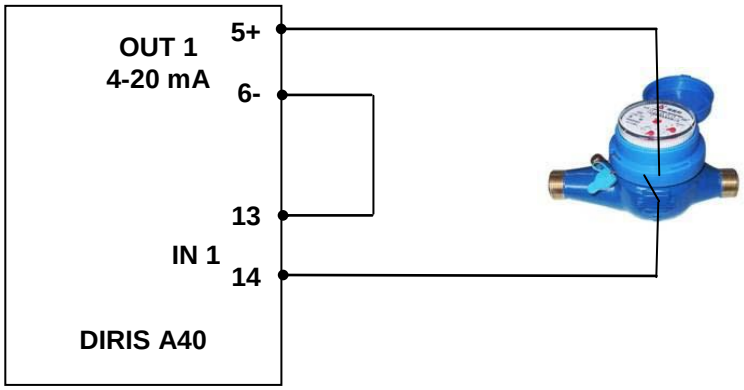
Changing the relay output N°1(addresses Hex. 22E) closed = 1 and opened = 0

Master frame to close the relay:

slave	Function	Address High-order	Address High-order	Value High-order	Value Low-order	CRC16
05	06	02	2E	00	01	283F

3.3- Use of the input for pulses metering

Example 1 : Input 1 used to count the pulses from a flow meter. The E1 meter can be visualised on the DIRIS' display and through the communication module.



Visualisation by JBUS/MODBUS (see instruction manual CDR27028)

Visualisation of the meter E1 status = 4967733 (Adress Hex 735 et 736)

Master request :

Slave	Function	Address High-order	Address High-order	Number of words High-order	Number of words Low-order	CRC16
05	03	07	35	00	02	75D

DIRIS reply:

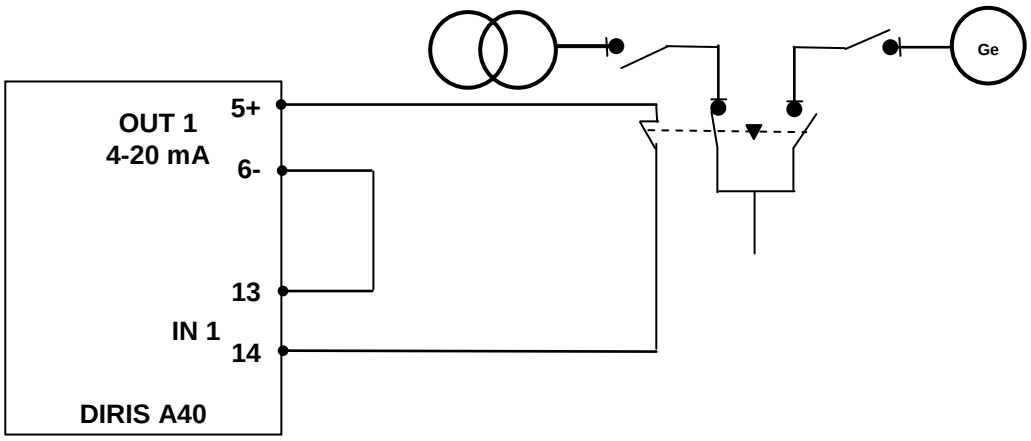
Slave	Function	Number of bytes	Word 1	Word 2	CRC16
05	03	04	1E35	01F0	A801
			7733	496	

The Diris' answer must be interpreted this way:

496 * 10000 + 7733 = 6 490 458 pulses

3.3- Use of the input to control position

***Example 1* : Control position (status) of a changeover switch.**



Command by JBUS/MODBUS (see instruction manual: CDR27028)

Visualisation of Input 1 status (address HEX 36E)

Master request

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
05	03	03	6E	00	02	A416

DIRIS reply:

Slave	Function	Address High-order	Address Low-order	Word 1	Word 2	CRC16
05	03	02	2E	0001	0000	EE33
				INPUTS Input 1 active	OUTPUTS	

CHAPTER 4 – RS 485 JBUS/MODBUS COMMUNICATION MODULE

The DIRIS A can be fitted with an RS485 JBUS/MODBUS communication module.
This module allows programming and visualizing the electrical values displayed by the DIRIS with a PC, a PLC or any other system.

The RS485 connection is wired in series according to the EIA 485 with 2 active wire (+, -).
One RS485 line allows the connection of 31 slaves (DIRIS) over a distance of 1500 meters at 9600 bauds.
The number of slaves can be increase by using repeater(s), however, the maximum of slaves is 255 by communication canal.

It is recommended to use twisted pair type cable (**LIYCY** type ; minimum section: 0,34mm²). In a disturbed environment or large network (in terms of length) we recommend using 1 shielded pair type **LIYCY-CY** (minimum section: 0,34mm²).

Communication frame:

The standard communication frame is following:

Slave address	Function code	Address	Data	CRC 16

According to the JBUS/MODBUS protocol, the transmission time must be less than 3 silences, i.e. the emission time of 3 characters so that the message is processed by the DIRIS.
The available functions code are following:

- 3 : to read n words (maximum 128)
- 6 : to write one word
- 8 : to diagnose exchanges between the master and the slave via meters 1 ,2, 4, 5 and 6.
- 16 : to write n words (maximum 128)
-

The response time (time out question/answer) is 250 ms maximum.

4.1 - Reading of electrical values on 2 words with HEX 300 table

Reading of current phase 1 (address Hex. 300) : I1 = 236,7 A

DIRIS A JBUS/MODBUS address : 7

Master request :

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	03	00	00	02	C429

DIRIS reply:

Slave	Function	Number of bytes	Word1	Word 2	CRC16
07	03	04	0003	9C9C	055A

236 700 mA

Reading of phase to phase voltage U12 (address Hex. 308) : U12 = 398,9 V AC

Master request :

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	03	0E	00	02	A5EA

DIRIS reply:

Slave	Function	Number of bytes	Word1	Word 2	CRC16
07	03	04	0000	9BD5	A3F6

39 893 mV

Reading of total active power (address Hex. 316) : P1 = + 158,78 kW

Master request :

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	03	16	00	02	25ED

DIRIS reply:

Slave	Function	Number of bytes	Word1	Word 2	CRC16
07	03	04	0000	3E06	0C51

15 878 kW/100

Reading of total active power (address Hex. 316) : P1 = - 1729 kW

Master request :

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	03	16	00	02	25ED

DIRIS reply:

Slave	Function	Number of bytes	Word1	Word 2	CRC16
07	03	04	FFFD	5C89	5D06

4 294 794 377 kW/100

If the answer corresponds to a negative value, the answer, in decimal value, will be higher than 2147 483 647.

In that case, it is necessary to convert the value in the following way:

First step: convert the value Hexadecimal into binary

Hexadecimal : FFFD5C89
Binary : 1111 1111 1111 1101 0101 1100 1000 1001

Second step: reverse the binary value

Binary : 1111 1111 1111 1101 0101 1100 1000 1001
opposite : 0000 0000 0000 0010 1010 0011 0111 0110

Third step: Add + 1

opposite : 0000 0000 0000 0010 1010 0011 0111 0110
+1
Binary : 0000 0000 0000 0010 1010 0011 0111 0111

Last step: convert in decimal to get the final result

Binary : 0000 0000 0000 0010 1010 0011 0111 0111

Decimal : 172919 kW/100

Reading of power factor phase 1 (address Hex. 330) : PF1 = 0,99 Inductive

Master request :

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	03	30	00	02	C426

DIRIS reply::

Slave	Function	Number of bytes	Word1	Word 2	CRC16
07	03	04	0000	03E7	DC89

999 /1000

Reading of power factor phase 1 (address Hex. 330) : PF1 = 0,94 Capacitive

Master request :

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	03	30	00	02	C426

DIRIS reply:

Slave	Function	Number of bytes	Word1	Word 2	CRC16
07	03	04	FFFF	FC54	DCE8

4294966356 / 1000

If the answer corresponds to a negative value, the answer, in decimal value, will be higher than 1000.

In that case, it is necessary to convert the value in the following way:

First step: convert the value Hexadecimal into binary

Hexadecimal : FFFFFC54
Binary : 1111 1111 1111 1111 1111 1100 0101 0100

Second step: reverse the binary value :

Binary : 1111 1111 1111 1111 1111 1100 0101 0100
opposite : 0000 0000 0000 0000 0000 0011 1010 1011

Third step: Add + 1

opposite : 0000 0000 0000 0000 0000 0011 1010 1011
+1

Binary : 0000 0000 0000 0000 0000 0011 1010 1100

Last step: convert in decimal

Binary : 0000 0000 0000 0000 0000 0011 1010 1100

Decimal : 940 /1000

Reading of positive active energy meter Lecture du compteur d'énergie active + (adresse Hex. 358) : Ea + = 06490374 kWh

Master request :

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	03	58	00	02	45FA

DIRIS reply:

Slave	Function	Number of bytes	Word1	Word 2	CRC16
07	03	04	0063	0906	7D37

6490374 kWh

4.2 - reading of electrical values on 1 word with HEX 700

DIRIS A JBUS/MODBUS address : 7
With current transformer ratio = CT =100/5 A and voltage transformer = VT = 1000/100 V AC

Reading of current phase 1 (address Hex. 700) :I1 = 100,7 A

Master request :

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	07	00	00	01	C429

DIRIS reply:

Slave	Function	Number of bytes	Word 1	CRC16
07	03	02	13AC	055A

5036 mA

It is necessary to convert the answer in the following way:

multiply by CT ratio

5036 mA x 100/5 = 100 720 mA =100,72 A

Reading of phase to phase voltage U12 (address Hex. 704) : U12 = 1055 V AC

Master request :

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	07	04	00	01	C4D9

DIRIS reply:

Slave	Function	Number of bytes	Word 1	CRC16
07	03	02	2938	2E06

10 552 V/100

It is necessary to convert the value in the following way:

multiply by VT ratio :

10 552 x 1000/100 = 105 520 V/100 = 1055,2 V AC

Reading of total active power (address Hex. 70B) : P1 = + 425,6 kW

Master request :

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	07	0B	00	01	F4DA

DIRIS reply:

Slave	Function	Number of bytes	Word 1	CRC16
07	03	02	0850	37B8

2128 kW/100

It is necessary to convert the value in the following way:

multiply by VT*CT ratio

2128*100/10*100/5= 425 600 kW/100 = 425,6 kW

Reading of total active power (address Hex. 70B): P1 = - 332,2 kW

Master request :

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	07	0B	00	01	F4DA

DIRIS reply:

Slave	Function	Number of bytes	Word 1	CRC16
07	03	02	F983	33B5

63875 kW/100

If the answer corresponds to a negative value, the answer, in decimal value, will be higher than 32767.

In that case, it is necessary to convert the value in the following way:

First step: convert the value Hexadecimal into binary

Hexadecimal : F983
Binary : 1111 1001 1000 0011

Second step: reverse the binary value

Binary : 1111 1001 1000 0011
opposite : 0000 0110 0111 1100

Third step: Add + 1

opposite : 0000 0110 0111 1100
+1
Binary: 0000 0110 0111 1101

Fourth step: convert in decimal

Binary : 0000 0110 0111 1101

Decimal : 1661 kW/100

Last step: multiply by VT*CT ratio

1661*100/10*100/5= 332 200 kW/100 = 332,2 kW

Reading of power factor phase 1 (address Hex. 718) : PF1 = 0,99 Inductive

Master request:

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Number of words Low-order	CRC16
07	03	07	18	00	01	051F

DIRIS reply:

Slave	Function	Number of bytes	Word 1	CRC16
07	03	04	03E7	DC89
			999 /1000	

Reading of positive active energy meters (adsress Hex. 72B + 72C) : Ea + = 06490458kWh

Master request:

Slave	Function	Address High-order	Address Low-order	Number of words High-order	Nombre de mots poids faible	CRC16
07	03	07	2B	00	02	45FA

DIRIS reply:

Slave	Function	Number of bytes	Word 1	Word 2	CRC16
07	03	04	01CA	0289	7D37
			458	649	

It is necessary to convert the value in the following way:

649 * 10000 + 458 = 6 490 458 kWh

4.3 - Modification of DIRIS configuration with “writing” function.

Configuration of CT primary (address Hex. 202) : TC = 1500 = 05DC en hexadecimal

Master request:

Slave	Function	Address High-order	Address Low-order	Value High-order	Value Low-order	CRC16
07	06	02	02	05	DC	2B1D

1500 in decimal

DIRIS reply:

Identical to master request

After having modified the parameters of the DIRIS, and to record them, it is necessary to send the backup order:

Slave	Function	Address High-order	Address Low-order	Value High-order	Value Low-order	CRC16
07	06	06	00	00	00	8924

DIRIS reply:

The DIRIS does not answer this order.

Configuration of network type (address Hex. 200) , Type = 3 NBL = 3 in hexadecimal

Master request :

Slave	Function	Address High-order	Address Low-order	Value High-order	Value Low-order	CRC16
07	06	02	00	00	03	C815

3 NBL

DIRIS reply:

The DIRIS does not answer this order.

After having modified the parameters of the DIRIS, and to record them, it is necessary to send the saving order:

Slave	Function	Address High-order	Address Low-order	Value High-order	Value Low-order	CRC16
07	06	06	00	00	00	8924

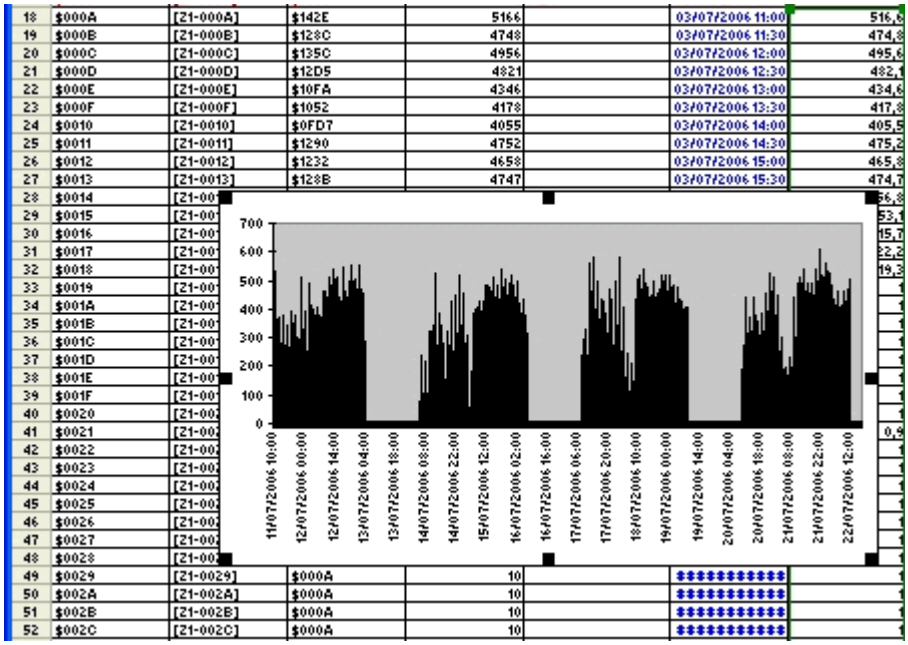
DIRIS response:

The DIRIS does not answer this order.

CHAPTER 5 – MEMORY MODULE

5.1. Powers demands configuration (P+/P-/Q+/Q-)

Powers demand storage (load curves) is used to store and analyse consumption of electrical distribution with date and time.



***Exemple 1*: Storage of active power (kWh) integrated on 10 minutes and 62 days. With internal synchronisation (internal clock) and reading by communication.**

DIRIS Configuration (see instruction manual: 876 588) :

- Memorisation of positive active power (+kWh) = MEMO P+ YES (yes)
- Memorisation of negative active power (+kWh) = MEMO P- NO (no)
- Memorisation of positive reactive power (+kvarh) = MEMO P+ NO (no)
- Memorisation of negative reactive power (-kvarh) = MEMO P- NO (no)
- Synchronisation mode = MEMO TOP EXT (external)
- Configuration of synchronisation top time = MEMO TIME 10' (10 minutes)
- Activation of date/time function = dAtE tIME YES (yes)
- Date configuration = dAtE 31-07-06
- Time configuration = tIME 15h10'35"

Reading of date and time of update of the timekeepers

Master request :

Slave	Function	Address High-order	Address Low-order	Value High-order	Value Low-order	CRC16
01	03	30	02	00	03	AB0B

DIRIS response:

Salve	Function	Number of bytes	Word 1	Word 2	Word 3	CRC16
01	03	06	071F	100A	0006	11C0
			07 31 July the 31th	10 0A 16 h 10 minutes	0006 00 secondes year 2006	

Reading of timekeeper for active powers P+/P- of last value

Master request :

Slave	Function	Address High-order	Address Low-order	Value High-order	Value Low-order	CRC16
01	03	30	00	00	01	8B0A

DIRIS response:

Salve	Function	Number of bytes	Word 1	CRC16
01	03	02	004C	B9B1

Reading of last power average value on 3051 address (address 3005 + timekeeper address)

Master request :

Slave	Function	Address High-order	Address Low-order	Value High-order	Value Low-order	CRC16
01	03	30	51	00	01	DADB

Adr. 3005 + 4C = 3051

DIRIS response:

Salve	Function	Number of bytes	Word 1	CRC16
01	03	02	16FA	3667

= 5882 in décimal without CT and VT ratio
= 5882 * (10000/5A) = 11 764 000
= 1176,4 kW on the interval 10 minutes of 4:10 pm

Address Hex	Decimal value (W/10)	Date and time	Value without CT and VT ratio (W)	Value multiply by CT and VT ration (W) TC = 10000/5
…	…	…	…	…
304D	5828	31/07/06 15 :30 :00	582.8	1165600
304E	4796	31/07/06 15 :40 :00	476.6	953200
304F	3597	31/07/06 15 :50 :00	359.7	719400
3050	5467	31/07/06 16 :00 :00	546.7	1093400
3051	5882	31/07/06 16 :10 :00	588.2	1176400

NB :

When DIRIS is switch off (MHT), this information is coded in the following way

First word star always with $Exxx

Adress + 0	$Emdd	1 word	m : month 1 to 12 dd : day 1 to 31
Adress + 1	$hhnn	1 word	hh : hours 0 to 23 nn : minutes 0 to 60
Adress + 2	$ssyy	1 word	ss : secondes 0 to 59 yy : year 0 à 255

When DIRIS is switch on (MST), this information is coded in the following way

First word star always with $Fxxx

Adress + 0	$Fmdd	1 word	m : month 1 to 12 dd : day 1 to 31
Adress + 1	$hhnn	1 word	hh : hours 0 to 23 nn : minutes 0 to 60
Adress + 2	$ssyy	1 word	ss : secondes 0 to 59 yy : year 0 à 255

The recorded average power, between DIRIS starting and the following interval of time, is framed by two MST. See below :

Adr Abs	Adr Rel Zone	Val Hex (W/10)	Val Dec (W/10)	MST = Power ON MHT = Power OFF	Date & Time	Values in W without CT and VT Ratio	Values in W with CT and VT Ratio CT = 150/5A
$04DA	[Z1-04DA]	$0009	9		27/07/2006 07:30	0,9	27
$04DB	[Z1-04DB]	$0009	9		27/07/2006 08:00	0,9	27
$04DC	[Z1-04DC]	$0009	9		27/07/2006 08:30	0,9	27
$04DD	[Z1-04DD]	$0009	9		27/07/2006 09:00	0,9	27
$04DE	[Z1-04DE]	$E71B	59163			/	
$04DF	[Z1-04DF]	$0908	2312			/	
$04E0	[Z1-04E0]	$1506	5382	MHT	27/07/2006 09:08	/	
$04E1	[Z1-04E1]	$F71B	63259			/	
$04E2	[Z1-04E2]	$0935	2357			/	
$04E3	[Z1-04E3]	$0006	6	MST	27/07/2006 09:53	/	
$04E4	[Z1-04E4]	$0002	2		27/07/2006 09:30	0,2	6
$04E5	[Z1-04E5]	$F71B	63259			/	
$04E6	[Z1-04E6]	$0A00	2560			/	
$04E7	[Z1-04E7]	$0006	6	MST	27/07/2006 10:00	/	
$04E8	[Z1-04E8]	$0009	9		27/07/2006 10:30	0,9	27
$04E9	[Z1-04E9]	$0009	9		27/07/2006 11:00	0,9	27
$04EA	[Z1-04EA]	$0009	9		27/07/2006 11:30	0,9	27
$04EB	[Z1-04EB]	$0008	8		27/07/2006 12:00	0,8	24
$04EC	[Z1-04EC]	$0008	8		27/07/2006 12:30	0,8	24

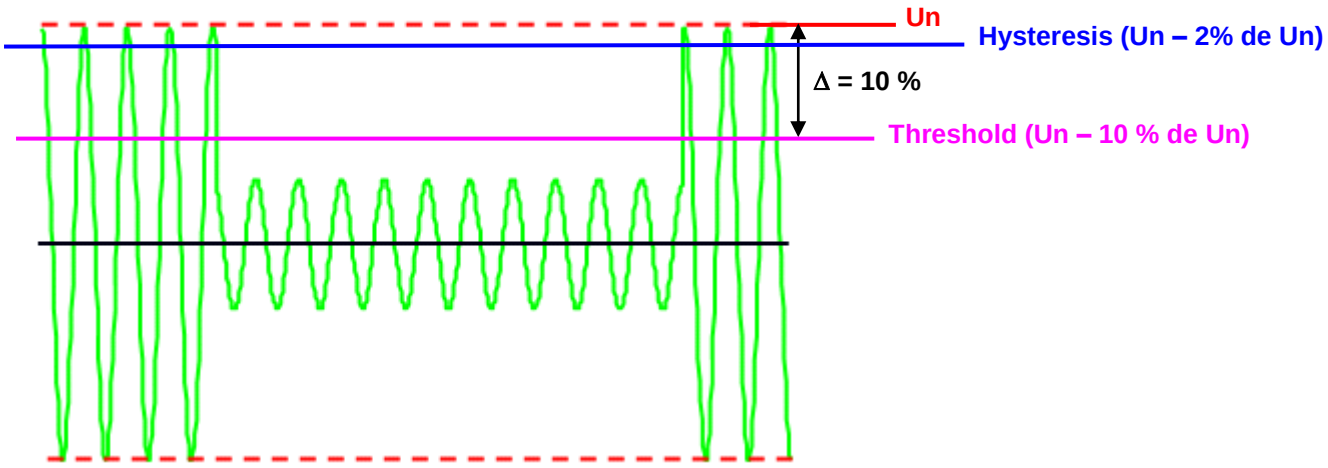
5.2. Configuration of voltage dips function (SAG)

This function is used to detect voltage dips according to EN 50160 standard (Voltage characteristics of electricity supplied by public distribution systems)

Example : ***Discover voltage dips (SAG) with a threshold in 10 % and a hysteresis of 2 %. Reading information with communication***

DIRIS configuration (see instruction manual : 876 588) :

- Voltage dips threshold (SAG) = dAtA SAG 10 %)
- Voltage dips hysteresis = dAta HySt SAG 2 %



Reading of fault parameter:

Master request :

Slave	Function	Address High-order	Address Low-order	Value High-order	Value Low-order	CRC16
01	03	0D	00	00	01	86A6

DIRIS response:

Salve	Function	Number of bytes	Word 1	CRC16
01	03	02	0005	7847

5 = U12

Reading of fault value:

Master request :

Slave	Function	Address High-order	Address Low-order	Value High-order	Value Low-order	CRC16
01	03	0D	01	00	02	86A6

DIRIS response:

Salve	Function	Nombre d'octets	Word 1	Word 2	CRC16
01	03	4	0000	0000	FA33
			0 V		

Reading of voltage dips duration :

Master request :

Slave	Function	Address High-order	Address Low-order	Value High-order	Value Low-order	CRC16
01	03	0D	06	00	02	86A6

DIRIS reply:

Salve	Function	Number of bytes	Word 1	Salve	CRC16
01	03	4	0000	03A2	7B7A
				Dec = 932 seconds	

Lecture de la date et de l'heure du creux :

Master request ::

Slave	Function	Address High-order	Address Low-order	Value High-order	Value Low-order	CRC16
01	03	0D	08	00	06	46A6

DIRIS reply:

Number of	Salve	Number of bytes	Word 1	Word 2	Word 3	Word 4	Word 5
01	03	12	000F	0007	0006	000E	0022
			31	07	06	14	Dec = 34
			31	July	2006	14h	34 min

word 6	CRC16
0012	xxxx
December = 12	
00 seconds	

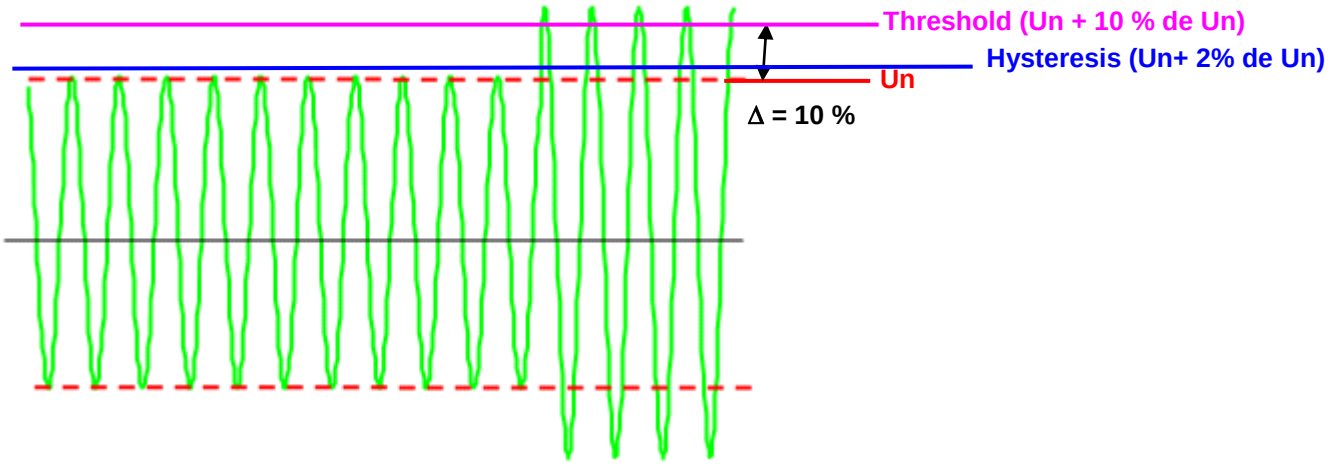
5.2. Configuration of over voltage function (SWELL)

This function is used to detect over voltage according to EN 50160 standards (Voltage characteristics of electricity supplied by public distribution systems)

Example : ***Discover over voltage (SWELL) with a threshold in 10 % and a hysteresis of 2 %. Reading information with communication***

DIRIS configuration (see instruction manual : 876 588) :

- Over voltage threshold (SWELL) = dAtA SAG 10 %)
- Over voltage hysteresis = dAta HySt SAG 2 %



Reading of the information is made in the same way as for voltage dips (see 5.2)