DIRIS A*p*

RS485 – JBUS/MODBUS®

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SOCOMEC

Systèmes de Coupure et de Protection

Industrial Switching and Protection Systems

PRELIMINARY OPERATIONS

NB:
For personnel and product safety please read the contents of these operating instructions carefully before connecting.

Check the following points as soon as you receive the Diris Ap package:
- the packing is in good condition,
- the product has not been damaged during transit,
- the product reference number conforms to your order,
- the package contains the product fitted with a pull-out terminal block,
- operating instructions.

GENERAL INFORMATION

FUNCTIONS

The optional Communication module provides an RS485 serial link (2 or 3 wires) with JBUS/MODBUS® protocol for the use of Diris Ap from a PC or PLC.

GENERAL POINTS

Recommendations:
You should use a shielded twisted pair (LIYCY type). In a disturbed environment or large network (in terms of length) we recommend the use of 2 shielded pairs (type LIYCY-CY). In this case, one pair is used for the + and the –, and another pair, where the 2 wires are short-circuited, for the 0 V.
A repeater (1 channel) or an arrestor (4 channels) should be used if you intend to exceed the distance (1500 m) and/or maximum number (31) of Diris. Please contact us for more information.

NB:
A 120 ohm resistance (found on the additional module) must be fixed at both ends of the link.

Other solutions are available (modem, optical fibre, etc.). Please contact us

For standard configurations, an RS 485 link is used to connect up to 31 Diris Ap with a PC or a PLC over a distance of 1500 metres, using JBUS/MODBUS© protocol.

INSTALLATION

The module is fitted onto the back of the DIRIS Ap in one of the 4 positions provided.

CONNECTION

⚠ The DIRIS Ap must be switched off

1

DIRIS 342 A

2 Fix the module in one of the four positions.

DIRIS 343 A

3

DIRIS 347 A

4 Follow indications when connecting the terminal.
Switch on voltage supply.

ENGLISH

PROGRAMMING

Programming starts after the reset to zero menu (rSET) or No. 2 pulse output duration (Out 2 DUR).

1 PROGRAMMING THE COMMUNICATION ADDRESS (COM ADR)

NB: *The address default setting is 5 (ADR 5). If you want this value, press ▼. You will pass to communication speed programming (COM BDS) If not, proceed as follows:*

KEYS	INSTRUCTION	DISPLAY	COMMENT
▶	Press once	COM ADR 005 PROG	to display flashing the 1st digit (press twice and three times for the 2nd and 3rd digit) or press ◀ to return to the left.

Press ▼ to decrement or ▲ to increment the selected digit value
Press ⮐ once to confirm
Press ▼ once to pass to speed programming (COM BDS)

NB: *the address can vary between 1 to 255.*

2 PROGRAMMING COMMUNICATION SPEED (COM BDS)

NB: *The speed default setting is 9600 BDS (BDS 9600). If you want this value, press ▼. You will pass to communication parity programming (COM PAR). If not, proceed as follows:*

KEYS	INSTRUCTION	DISPLAY	COMMENT
▶	Press once	COM BDS 9600 PROG	to display flashing 9600 bauds
▲	Press once	COM BDS 19200 PROG	Press again for: 38400, 2400, 4800 and 9600 bauds
▼	Press once	COM BDS 4800 PROG	Press again for: 2400, 38400, 19200 and 9600 bauds
⮐	Press once	COM BDS 4800 PROG	Confirm speed. Press on ▼ to pass to parity programming (PAR).

3 PROGRAMMING COMMUNICATION PARITY (COM PAR)

NB: *As a default setting, the communication is without parity (PAR NO). If you want this setting, press ▼. You will pass to communication stop bit programming (COM STOP). If not, proceed as follows:*

KEYS	INSTRUCTION	DISPLAY	COMMENT
▶	Press once	COM PAR NO PROG	No parity
		ou	
▲	Press once	COM PAR ODD PROG	Press again for: EVEN (even parity) and NO (without parity)
▼	Press once	COM PAR EVEN PROG	Press again for: ODD (odd parity) and NO (without parity)
↵	Press once	COM PAR NO PROG	Confirm parity. Press on ▼ to pass to stop bit programming (STOP)

4 PROGRAMMING COMMUNICATION STOP BIT (COM STOP)

NB: *You will pass to No. 1 analog output programming (OUt 1 20 MA) if the analog output module is connected or you will return to network type programming (nET)*

KEYS	INSTRUCTION	DISPLAY	COMMENT
▶	Press once	COM STOP 1 PROG	to display flashing stop bit value
▲ or ▼	Press once	COM STOP 2 PROG	1 for 1 bit and 2 for 2 bits
↵	Press once	COM STOP 1 PROG	Confirm stop bit. Press on ▼ to return to network type programming.

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COMMUNICATION

The JBUS/MODBUS® used by the Diris A*p* involves a dialogue using a master-slave hierarchical structure. There are two possible dialogues:

- the master communicates with a slave (Diris A*p*) and waits for its reply
- the master communicates with all the slaves (Diris A*p*) without waiting for their reply.

The mode of communication is the RTU (Remote Terminal Unit) using hexadecimal characters of at least 8 bits.

The standard communications frame consists of:

Slave address	Function code	Address	Data	CRC 16

NB:
When selecting slave address 0, a message is sent to all the instruments present on the network (only for functions 6 and 16).

Comment:
The maximum reply time is 250ms

According to the JBUS/MODBUS® protocol, 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.

To correctly use information, the following functions are important:

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, 3, 4, 5 and 6.
16 : to write n words (maximum 128).

LIST OF PARAMETERS TO BE DISPLAYED (FUNCTION 3)

Table of values with allocated current and voltage winf-ding ratios on 2 words

Decimal address	Hexa. address	Number of words	Text	Unit
768	300	2	phase 1 current	mA
770	302	2	phase 2 current	mA
772	304	2	phase 3 current	mA
774	306	2	Neutral current	mA
776	308	2	phase to phase voltage U12	V/100
778	30A	2	phase to phase voltage U23	V/100
780	30C	2	phase to phase voltage U31	V/100
782	30E	2	phase to neutral voltage phase 1	V/100
784	310	2	phase to neutral voltage phase 2	V/100
786	312	2	phase to neutral voltage phase 3	V/100
788	314	2	Frequency	Hz/100
790	316	2	Σ Active power +/-	kW/100
792	318	2	Σ Reactive power +/-	kvar/100
794	31A	2	Σ Apparent power +/-	kVA/100
796	31C	2	Σ Power factor -: capacitive et +: inductive	0,001
798	31E	2	Active power phase 1 +/-	kW/100
800	320	2	Active power phase 2 +/-	kW/100
802	322	2	Active power phase 3 +/-	kW/100
804	324	2	Reactive power phase 1 +/-	kvar/100
806	326	2	Reactive power phase 2 +/-	kvar/100
808	328	2	Reactive power phase 3 +/-	kvar/100
810	32A	2	Apparent power phase 1	kVA/100
812	32C	2	Apparent power phase 2	kVA/100
814	32E	2	Apparent power phase 3	kVA/100
816	330	2	Power factor phase 1 -: capacitive et +: inductive	0,001
818	332	2	Power factor phase 2 -: capacitive et +: inductive	0,001
820	334	2	Power factor phase 3 -: capacitive et +: inductive	0.001
822	336	2	Average value I1	mA

Decimal address	Hexa. address	Number of words	Text	Unit
824	338	2	Average value I2	mA
826	33A	2	Average value I3	mA
828	33C	2	Average value Σ Active power +	kW/100
830	33E	2	Average value Σ Active power -	kW/100
832	340	2	Average value Σ Reactive power +	kvar/100
834	342	2	Average value Σ Reactive power -	kvar/100
836	344	2	Average value Σ Apparent power	kVA/100
838	346	2	Maximum value I1	mA
840	348	2	Maximum value I2	mA
842	34A	2	Maximum value I3	mA
844	34C	2	Maximum value Σ Active power +	kW/100
846	34E	2	Maximum value Σ Active power -	kW/100
848	350	2	Maximum value Σ Reactive power +	kvar/100
850	352	2	Maximum value Reactive power -	kvar/100
852	354	2	Maximum value Σ Apparent power	kVA/100
854	356	2	Hour meter	1/100 h
856	358	2	Active energy +	kWh
858	35A	2	Reactive energy +	kWh
860	35C	2	Apparent energy	kVAr
862	35E	2	Active energy -	kWh
864	360	2	Reactive energy -	kvarh

Address available with the Monitoring or Control/Command option

Decimal address	Hexa. address	Number of words	Text	Unit
866	362	2	input pulse meter 1	-
868	364	2	input pulse meter 2	-
870	366	2	Number of impulse meters	-
872	368	2	current alarm: 0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +∑P 9 : +∑Q 10 : ∑S 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -∑P 30 : -∑Q 31 : -∑PFC	-
874	36A	2	current overrun: 0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +∑P 9 : +∑Q	–

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Decimal address	Hexa. address	Number of words	Text	Unit
			10 : ∑S 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -∑P 30 : -∑Q 31 : -∑PFC	
876	36C	2	Number of inputs-outputs High-order : No of inputs High-order : No of outputs	–
878	36F	2	Status of inputs-outputs bit 0 : status input 1 (0 = open, 1 = closed) bit 1 : status input 2 (0 = open, 1 = closed) bit 2 : status input 3 (0 = open, 1 = closed) bit 3 : status input 4 (0 = open, 1 = closed) bit 4 : status input 5 (0 = open, 1 = closed) bit 5 : status input 6 (0 = open, 1 = closed) bit 15 : status output 1 (0 = open, 1 = closed) bit 16 : status output 2 (0 = open, 1 = closed) bit 17 : status output 3 (0 = open, 1 = closed) bit 18 : status output 4 (0 = open, 1 = closed) bit 19 : status output 5 (0 = open, 1 = closed) bit 20 : status output 6 (0 = open, 1 = closed)	–

Instant value display

880	370	2	average value of currents	mA
882	372	2	average value of phase to phase voltages	V/100
884	374	2	average value of phase to neutral voltages	V/100
886	376	2	minimum current on the 3 phases	mA
888	378	2	minimum current on the neutral	mA
890	37A	2	minimum phase to phase voltage on the 3 phases	V/100
882	37C	2	minimum frequency	Hz/100
894	37F	2	maximum current on the 3 phases	mA
896	380	2	maximum current on the neutral	mA
898	382	2	maximum phase to phase voltage on the 3 phases	V/100
900	384	2	maximum frequency	Hz/100
902	386	2	minimum power factor	0,001
904	388	2	minimum active power +/-	kW/100
906	38A	2	minimum reactive power +/-	kvar/100
908	38C	2	maximum power factor	0,001
910	38F	2	maximum active power +/-	kW/100
912	390	2	maximum reactive power +/-	kvar/100

Zone size: 146 words (decimal) or 92 (hexadecimal).

Example:
To display all the values for Diris number 5 in one inquiry, the following frame should be sent:

Slave	Function	High-order address	Low-order address	High-order word n°	Low-order word n°	CRC 16
05	03	03	00	00	92	C5A7

NB:
Values should be multiplied by the following coefficient:

$CT = \frac{100}{5} = 20 \quad VT = \frac{20000}{100} = 200$

$CT \times VT = 20 \times 200$
$= 4000$

Powers will be multiplied by 4000 (if there is no VT, then VT = 1), currents by 20 and voltages by 200.

NB:
For powers, when the highest order bit is at 1, the value is negative

Table of values without allocated current and voltage winding ratios on 1 word

Decimal address	Hexa. address	N° of words	Text	Unit
1792	700	1	current phase 1	mA
1793	701	1	current phase 2	mA
1794	702	1	current phase 3	mA
1795	703	1	Neutral current	mA
1796	704	1	phase to phase voltage U12	V/100
1797	705	1	phase to phase voltage U23	V/100
1798	706	1	phase to phase voltage U31	V/100
1799	707	1	phase to neutral phase 1	V/100
1800	708	1	phase to neutral phase 2	V/100
1801	709	1	phase to neutral phase 3	V/100
1802	70A	1	Frequency	Hz/100
1803	70B	1	Σ Active power +/-	kW/100
1804	70C	1	Σ Reactive power +/-	kvar/100
1805	70D	1	Σ Apparent power +/-	kVA/100
1806	70E	1	Σ Power factor L/C -: capacitive and +: inductive	0,001
1807	70F	1	Active power phase 1 +/-	kW/100
1808	710	1	Active power phase 2 +/-	kW/100
1809	711	1	Active power phase 3 +/-	kW/100
1810	712	1	Reactive power phase 1 +/-	kvar/100
1811	713	1	Reactive power phase 2 +/-	kvar/100
1812	714	1	Reactive power phase 3 +/-	kvar/100
1813	715	1	Apparent power phase 1	kVA/100
1814	716	1	Apparent power phase 2	kVA/100
1815	717	1	Apparent power phase 3	kVA/100
1816	718	1	Power factor phase 1 -: capacitive and +: inductive	0,001
1817	719	1	Power factor phase 2 -: capacitive and +: inductive	0,001
1818	71A	1	Power factor phase 3 -: capacitive and +: inductive	0,001
1819	71B	1	Average values I1	mA
1820	71C	1	Average values I2	mA
1821	71D	1	Average values I3	mA
1822	71E	1	Average value Σ Active power +	kW/100
1823	71F	1	Average value Σ Active power -	kW/100
1824	720	1	Average value Σ Reactive power +	kvar/100
1825	721	1	Average value Σ Reactive power -	kvar/100
1826	722	1	Average value Σ Apparent power	KVA/100
1827	723	1	Maximum value I1	mA
1828	724	1	Maximum value I2	mA
1829	725	1	Maximum value I3	mA
1830	726	1	Maximum value Σ Active power +	kW/100
1831	727	1	Maximum value Σ Active power -	kW/100
1832	728	1	Maximum value Σ Reactive power +	kvar/100
1833	729	1	Maximum value Σ Reactive power -	kvar/100
1834	72A	1	Maximum value Σ Apparent power	kVA/100

Allocated values of current and voltage winding ratios

1835	72C	1	Active energy + < 10000	kWh
1836	72D	1	Active energy + > 10000	kWh
1837	72D	1	Reactive energy + < 10000	kvarh
1838	72E	1	Reactive energy + > 10000	kvarh
1839	72F	1	Apparent energy < 10000	kVAh
1840	730	1	Apparent energy > 10000	kVAh
1841	731	1	Active energy - < 10000	kWh
1842	732	1	Active energy - > 10000	kWh
1843	733	1	Reactive energy - < 10000	kvarh
1844	734	1	Reactive energy - > 10000	kvarh

Address available with the Monitoring or Control/Command option

Decimal address	Hexa. address	N° of words	Text	Unit
1845	735	1	impulse meter inputs 1 < 10000	-
1846	736	1	impulse meter inputs 1 > 10000	-
1847	737	1	impulse meter inputs 2 < 10000	-
1848	738	1	impulse meter inputs 2 > 10000	-
1849	739	1	impulse meter inputs 3 < 10000	-
1850	73A	1	impulse meter inputs 3 > 10000	-
1851	73B	1	impulse meter inputs 4 < 10000	-
1852	73C	1	impulse meter inputs 4 > 10000	-
1853	73D	1	impulse meter inputs 5 < 10000	-
1854	73E	1	impulse meter inputs 5 > 10000	-
1855	73F	1	impulse meter inputs 6 < 10000	-
1856	740	1	impulse meter inputs 6 > 10000	-

Display of non-allocated instant values of current and voltage winding ratios

Decimal address	Hexa. address	N° of words	Text	Unit
1857	741	1	average value of currents	mA
1858	742	1	average value of phase to phase voltages	V/100
1859	743	1	average value of phase to neutral voltages	V/100
1860	744	1	minimum current on the 3 phases	mA
1861	745	1	minimum current on the neutral	MA
1862	746	1	minimum phase to phase voltage on the 3 phases	V/100
1863	748	1	minimum frequency	Hz/100
1864	749	1	maximum current on the 3 phases	MA
1865	74A	1	maximum current on the neutral	MA
1866	74B	1	maximum phase to phase voltage on the 3 phases	V/100
1867	74C	1	maximum frequency	Hz/100
1868	74D	1	minimum power factor	0,001
1869	74E	1	minimum active power +/-	kW/100
1870	74F	1	minimum reactive power +/-	kvar/100
1871	750	1	maximum power factor	0,001
1872	751	1	maximum active power +/-	kW/100
1873	752	1	maximum reactive power +/-	kvar/100
1874	753	1	thd I1	0,1%
1875	754	1	thd I2	0,1%
1876	755	1	thd I3	0,1%
1877	756	1	thd In	0,1%
1878	757	1	thd U12	0,1%
1879	758	1	thd U23	0,1%
1880	759	1	thd U31	0,1%
1881	760	1	thd V1	0,1%
1882	761	1	thd V2	0,1%
1883	762	1	thd V3	0,1%
1884	763	1	minimum thd I	0,1%
1885	764	1	minimum thd In	0,1%
1886	765	1	minimum thd U	0,1%
1887	766	1	maximum thd I	0,1%
1888	768	1	maximum thd In	0,1%
1889	769	1	maximum thd U	0,1%

Size of this zone : 98 words (decimal) or 62 (hexadecimal)

Example:
To read 177 645 kWh, the following message should be sent :

Slave	Function	High-order address	Low-order address	High-order word n°	Low-order word n°	CRC 16
05	03	07	2B	00	02	B4F3

Diris Ap reply:

Slave	Function	Number of bytes	Value high-order	Value low-order	CRC 16
05	03	04	285	B1	6FD6
			645	**177**	

Example:
To display all the values for Diris number 5 in one inquiry, the following frame should be sent:

Slave	Function	High-order address	Low-order address	High-order word n°	Low-order word n°	CRC 16
05	03	07	00	00	62	C4D3

Alarm event log

Decimal address	Hexa. address	N° of words	Text	Unit
1280	500	1	current alarm OUT 1 lower threshold 0: no alarm 1: I1 2: I2 3: I3 4: In 5: U12 6: U23 7: U31 8: +ΣP 9: +ΣQ 10: ΣS 11: F 12: ΣFP 15: thd I1 16: thd I2 17: thd I3 18: thd U12 19: thd U23 20: thd U31 21: time 22: V1 23: V2 24: V3 25: thd In 26: thd V1 27: thd V2 28: thd V3 29: - ΣP 30: -ΣQ 31: CPF	–
1281	501	2	current alarm OUT 1 lower threshold value	–
1283	503	1	current alarm OUT 1 upper threshold 0: no alarm 1: I1 2: I2	–

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Decimal address	Hexa. address	N° of words	Text	Unit
			3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : - ΣP 30 : -ΣQ 31 : CPF	
1084	504	2	current alarm OUT 1 upper threshold value	–
1086	506	1	duration	sec
1087	507	1	alarm 1 OUT 1 lower threshold 0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -ΣP 30 : -ΣQ 31 : CPF	–
1288	508	2	alarm 1 OUT 1 lower threshold value	–
1290	50A	1	alarm 1 OUT 1 upper threshold 0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12	–

Decimal address	Hexa. address	N° of words	Text	Unit
			6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -ΣP 30 : -ΣQ 31 : CPF	
1291	50B	2	alarm 1 OUT 1 upper threshold value	–
1293	50D	1	duration	sec
1294	50E	1	alarm 2 OUT 1 lower threshold 0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -ΣP 30 : -ΣQ 31 : CPF	–
1295	50F	2	alarm 2 OUT 1 lower threshold value	–
1297	511	1	alarm 2 OUT 1 upper threshold 0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP	–

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Decimal address	Hexa. address	N° of words	Text	Unit
			9: +ΣQ 10: ΣS 11: F 12: LPF 15: thd I1 16: thd I2 17: thd I3 18: thd U12 19: thd U23 20: thd U31 21: time 22: V1 23: V2 24: V3 25: thd In 26: thd V1 27: thd V2 28: thd V3 29: -ΣP 30: -ΣQ 31: CPF	–
1298	512	2	alarm 2 OUT 1 upper threshold value	–
1300	514	1	duration	sec
1301	515	1	alarm 3 OUT 1 lower threshold 0: no alarm 1: I1 2: I2 3: I3 4: In 5: U12 6: U23 7: U31 8: ΣP + 9: ΣQ + 10: ΣS 11: F 12: LPF 15: thd I1 16: thd I2 17: thd I3 18: thd U12 19: thd U23 20: thd U31 21: time 22: V1 23: V2 24: V3 25: thd In 26: thd V1 27: thd V2 28: thd V3 29: -ΣP 30: -ΣQ 31: CPF	–
1302	516	2	alarm 3 OUT 1 lower threshold value	–
1304	518	1	alarm 3 OUT 1 upper threshold 0: no alarm 1: I1 2: I2 3: I3 4: In 5: U12 6: U23 7: U31 8: ΣP + 9: ΣQ + 10: ΣS 11: F 12: LPF 15: thd I1 16: thd I2	–

Decimal address	Hexa. address	N° of words	Text	Unit
			17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -ΣP 30 : -ΣQ 31 : CPF	
1305	519	2	alarm 3 OUT 1 upper threshold value	–
1307	51B	1	duration	s.
1308	51C	1	current alarm OUT 2 lower threshold 0 : no alarm 1: I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : ΣFP 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -ΣP 30 : -ΣQ 31 : CPF	–
1309	51D	2	current alarm OUT 2 lower threshold value	–
1311	51F	1	current alarm OUT 2 upper threshold 0 : no alarm 1: I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : ΣFP 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1	– –

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Decimal address	Hexa. address	N° of words	Text	Unit
			23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -ΣP 30 : -ΣQ 31 : CPF	
1312	520	2	current alarm OUT 2 upper threshold value	–
1314	522	1	duration	sec
1315	523	1	alarm 1 OUT 2 lower threshold 0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -ΣP 30 : -ΣQ 31 : CPF	– –
1316	524	2	alarm 1 OUT 2 lower threshold value	–
1318	526	1	alarm 1 OUT 2 upper threshold 0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3	– –

Decimal address	Hexa. address	N° of words	Text	Unit
			29 : -ΣP 30 : -ΣQ 31 : CPF	
1319	527	2	alarm 1 OUT 2 upper threshold value	–
1321	529	1	duration	s.
1322	52A	1	alarm 2 OUT 2 lower threshold 0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -ΣP 30 : -ΣQ 31 : CPF	–
1323	52B	2	alarm 2 OUT 2 lower threshold value	–
1325	52D	1	alarm 2 OUT 2 upper threshold 0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -ΣP 30 : -ΣQ 31 : CPF	–
1326	52E	2	alarm 2 OUT 2 upper threshold value	–
1328	530	1	duration	s

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Decimal address	Hexa. address	N° of words	Text	Unit
1329	531	1	alarm 3 OUT 2 lower threshold	–
			0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -ΣP 30 : -ΣQ 31 : CPF	
1330	532	2	alarm 3 OUT 2 lower threshold value	–
1332	534	1	alarm 3 OUT 2 upper threshold 0 : no alarm 1 : I1 2 : I2 3 : I3 4 : In 5 : U12 6 : U23 7 : U31 8 : +ΣP 9 : +ΣQ 10 : ΣS 11 : F 12 : LPF 15 : thd I1 16 : thd I2 17 : thd I3 18 : thd U12 19 : thd U23 20 : thd U31 21 : time 22 : V1 23 : V2 24 : V3 25 : thd In 26 : thd V1 27 : thd V2 28 : thd V3 29 : -ΣP 30 : -ΣQ 31 : CPF	– –
1333	535	2	alarm 3 OUT 2 upper threshold value	–
1335	537	1	duration	sec
1336	538	1	status inputs 1 and 2	–

Size of this zone : 56 words (decimal) or 38 (hexadecimal)

Table of current and voltage harmonics

Decimal address	Hexa. address	N° of words	Text	Unit
2304	900	1	thd I1	0.1 %
2305	901	1	thd I2	0.1 %
2306	902	1	thd I3	0.1 %
2307	903	1	thd In	0.1 %
2308	904	1	thd U12	0.1 %
2309	905	1	thd U23	0.1 %
2310	906	1	thd U31	0.1 %
2311	907	1	thd V1	0.1 %
2312	908	1	thd V2	0.1 %
2313	909	1	thd V3	0.1 %
2314	90A	1	harmonic I1 row 3	0.1 %
2315	90B	1	harmonic I2 row 3	0.1 %
2316	90C	1	harmonic I3 row 3	0.1 %
2317	90D	1	harmonic IN row 3	0.1 %
2318	90E	1	harmonic I1 row 5	0.1 %
2319	90F	1	harmonic I2 row 5	0.1 %
2320	910	1	harmonic I3 row 5	0.1 %
2321	911	1	harmonic IN row 5	0.1 %
2322	912	1	harmonic I1 row 7	0.1 %
2323	913	1	harmonic I2 row 7	0.1 %
2324	914	1	harmonic I3 row 7	0.1 %
2325	915	1	harmonic IN row 7	0.1 %
2326	916	1	harmonic I1 row 9	0.1 %
2327	917	1	harmonic I2 row 9	0.1 %
2328	918	1	harmonic I3 row 9	0.1 %
2329	919	1	harmonic IN row 9	0.1 %
2330	91A	1	harmonic I1 row 11	0.1 %
2331	91B	1	harmonic I2 row 11	0.1 %
2332	91C	1	harmonic I3 row 11	0.1 %
2333	91D	1	harmonic IN row 11	0.1 %
2334	91E	1	harmonic I1 row 13	0.1 %
2335	91F	1	harmonic I2 row 13	0.1 %
2336	920	1	harmonic I3 row 13	0.1 %
2337	921	1	harmonic IN row 13	0.1 %
2338	922	1	harmonic I1 row 15	0.1 %
2339	923	1	harmonic I2 row 15	0.1 %
2340	924	1	harmonic I3 row 15	0.1 %
2341	925	1	harmonic IN row 15	0.1 %
2342	926	1	harmonic U12 row 3	0.1 %
2343	927	1	harmonic U23 row 3	0.1 %
2344	928	1	harmonic U31 row 3	0.1 %
2345	929	1	harmonic U12 row 5	0.1 %
2346	92A	1	harmonic U23 row 5	0.1 %
2347	92B	1	harmonic U31 row 5	0.1 %
2348	92C	1	harmonic U12 row 7	0.1 %
2349	92D	1	harmonic U23 row 7	0.1 %
2350	92E	1	harmonic U31 row 7	0.1 %
2351	92F	1	harmonic U12 row 9	0.1 %
2352	930	1	harmonic U23 row 9	0.1 %
2353	931	1	harmonic U31 row 9	0.1 %
2354	932	1	harmonic U12 row 11	0.1 %
2355	933	1	harmonic U23 row 11	0.1 %
2356	934	1	harmonic U31 row 11	0.1 %
2357	935	1	harmonic U12 row 13	0.1 %
2358	936	1	harmonic U23 row 13	0.1 %
2359	937	1	harmonic U31 row 13	0.1 %
2360	938	1	harmonic U12 row 15	0.1 %
2361	939	1	harmonic U23 row 15	0.1 %
2362	93A	1	harmonic U31 row 15	0.1 %
2363	93B	1	harmonic V1 row 3	0.1 %
2364	93C	1	harmonic V2 row 3	0.1 %

Decimal address	Hexa. address	N° of words	Text	Unit
2365	93D	1	harmonic V3 row 3	0.1 %
2366	93E	1	harmonic V1 row 5	0.1 %
2367	93F	1	harmonic V2 row 5	0.1 %
2368	940	1	harmonic V3 row 5	0.1 %
2369	941	1	harmonic V1 row 7	0.1 %
2370	942	1	harmonic V2 row 7	0.1 %
2371	943	1	harmonic V3 row 7	0.1 %
2372	944	1	harmonic V1 row 9	0.1 %
2373	945	1	harmonic V2 row 9	0.1 %
2374	946	1	harmonic V3 row 9	0.1 %
2375	947	1	harmonic V1 row 11	0.1 %
2376	948	1	harmonic V2 row 11	0.1 %
2377	949	1	harmonic V3 row 11	0.1 %
2378	94A	1	harmonic V1 row 13	0.1 %
2379	94B	1	harmonic V2 row 13	0.1 %
2380	94C	1	harmonic V3 row 13	0.1 %
2381	94D	1	harmonic V1 row 15	0.1 %
2382	94E	1	harmonic V2 row 15	0.1 %
2383	95F	1	harmonic V3 row 15	0.1 %
2384	95F	1	minimum thd I	0,1%
2385	951	1	minimum thd In	0,1%
2385	952	1	minimum thd U	0,1%
2386	953	1	maximum thd I	0,1%
2387	954	1	maximum thd In	0,1%
2388	955	1	maximum thd U	0,1%

Size of this zone : 80 words (decimal) or 50 (hexadecimal)

NB: *if several options are used, the number corresponding to the option must be added.*

Option recognition table

Decimal address	Hexa. address	N° of words	Text	Unit
26	100	1	0 : no option 1 : metering option 2 : communication option 4 : metering and harmonics option 8 : unused 10 : inputs 1/outputs option 20 : analog outputs 1 option 40 : unused 80 : analog outputs 2 option 100 : inputs 2/outputs option 200 : inputs 3/outputs option 400 : CT option on the neutral	–
27	101	1	Identification Slot 1 option 0xFF: no option 0x0: communication option 0x1: metering option 0x20: inputs/outputs option 0x30: analog outputs option 0x40: metering and harmonics option 0x50: Profibus option	–
28	102	1	Identification Slot 2 option	–
29	103	1	Identification Slot 3 option	–
30	104	1	Identification Slot 4 option	–

Size of this zone : 5 words (decimal) or 5 (hexadecimal)

LIST OF PARAMETERS TO BE DISPLAYED OR PROGRAMMED (FUNCTION 3, 6 OR 16)

Decimal address	Hexa. address	N° of words	Text	Unit
512	200	1	Network type: 0: 1BL 1: 2BL 2: 3BL 3:3NBL 4:4BL 5: 4NBL	–
513	201	1	CT secondary: 1: 1 A 5: 5 A	A
514	202	1	CT primary	A
515	203	1	Voltage input on PT: 0 : No 1: Yes	–
516	204	2	PT primary	V
518	206	1	PT secondary: 60: 60 V 100: 100 V 110: 110 V 115: 115 V 120: 120 V 173: 173 V 190: 190 V	V
519	207	1	synchronisation of I AVG/MAX: 5 :5 minutes 8: 8 minutes 10: 10 minutes 15: 15 minutes 20: 20 minutes 30: 30 minutes 60: 60 minutes	–
520	208	1	synchronisation of P/Q/S AVG/MAX: 5 : 5 minutes 8: 8 minutes 10: 10 minutes 15: 15 minutes 20: 20 minutes 30: 30 minutes 60: 60 minutes	–
521	209	1	OUT 1 allocation 0: kWh + 1 : kvarh + 2 : kVAh 3: kWh – 4 : kvarh -	–
522	20A	1	OUT 1 impulse value: 0 : 0.1 kWh/kvarh/kVAh 1: 1 kWh/kvarh/kVAh 2: 10 kWh/kvarh/kVAh 3: 100 kWh/kvarh/kVAh 4: 1000 kWh/kvarh/kVAh 5: 10000 kWh/kvarh/kVAh	–
523	20B	1	OUT 1 impulse duration: 1 : 100 ms 2 : 200 ms 3 : 300 ms 4 : 400 ms 5 : 500 ms 6 : 600 ms 7 : 700 ms 8 : 800 ms 9 : 900 ms	–
524	20C	1	OUT 2 allocation: 0 : kWh + 1 : kvarh +	–

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Decimal address	Hexa. address	N° of words	Text	Unit
			2 : kVAh 3 : kWh – 4 : kvarh -	
525	20D	1	OUT 2 impulse value: 0 : 0.1 kWh/kvarh/kVAh 1 : 1 kWh/kvarh/kVAh 2 : 10 kWh/kvarh/kVAh 3 : 100 kWh/kvarh/kVAh 4 : 1000 kWh/kvarh/kVAh 5 : 10000 kWh/kvarh/kVAh	–
526	20E	1	OUT 2 impulse duration: 1 : 100 ms 2 : 200 ms 3 : 300 ms 4 : 400 ms 5 : 500 ms 6 : 600 ms 7 : 700 ms 8 : 800 ms 9 : 900 ms	–
527	20F	1	Analog output type OUT 1 0 : 0/20 mA 1 : 4/20 mA 2: 30 V	–
528	210	1	Output allocation analog OUT 1 0 : I1 1 : I2 2 : I3 3 : In 4 : U12 5 : U23 6 : U31 7 : ΣP 8 : ΣQ 9 : ΣS 10 : ΣPF 11 : V1 12 : V2 13 : V3 14 : F	–
529	211	1	value at 0 or 4 mA from output analog OUT 1	–
530	212	1	unit at 0 or 4 mA from output analog OUT 1 0 : / 1 : k 2 : M	–
531	213	1	value at 20 mA from output analog OUT 1	–
532	214	1	unit at 20 mA from output analogique OUT 1 0 : / 1 : k 2 : M	–
533	215	1	analog output type OUT 2 0 : 0/20 mA 1 : 4/20 mA	–
534	216	1	allocation of analog output OUT 2 0 : I1 1 : I2 2 : I3 3 : In 4 : U12 5 : U23 6 : U31	–

Decimal address	Hexa. address	N° of words	Text	Unit
			7 : ΣP 8 : ΣQ 9 : ΣS 10 : ΣPF 11 : V1 12 : V2 13 : V3 14 : F	
535	217	1	value at 0 or 4 mA from output analog output OUT 2	–
536	218	1	unit at 0 or 4 mA from analog output OUT 2 0 : / 1 : k 2 : M	–
537	219	1	value at 20 mA from analog output OUT	–
538	21A	1	unit at 20 mA from output analog OUT 2 0 : / 1 : k 2 : M	–
539	21B	1	type of analog output OUT 3 0 : 0/20 mA 1 : 4/20 mA 2: 30 V	–
540	21C	1	output allocation analog OUT 3 0 : I1 1 : I2 2 : I3 3 : In 4 : U12 5 : U23 6 : U31 7 : ΣP 8 : ΣQ 9 : ΣS 10 : ΣPF 11 : V1 12 : V2 13 : V3 14 : F	–
541	21D	1	value at 0 or 4 mA from analog output OUT 3	–
542	21E	1	unit at 0 or 4 mA from output analog output OUT 3 0 : / 1 : k 2 : M	–
543	21F	1	value at 20 mA from output analog OUT 3	–
544	220	1	unit at 20 mA from output analog OUT 3 0 : / 1 : k 2 : M	–
545	221	1	type of analog output OUT 4 0 : 0/20 mA 1 : 4/20 mA 2: 30 V	–
546	222	1	output allocation analog OUT 4 0 :I1 1 : I2 2 : I3 3 : In	–

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Decimal address	Hexa. address	N° of words	Text	Unit
			4 : U12 5 : U23 6 : U31 7 : ΣP 8 : ΣQ 9 : ΣS 10 : ΣPF 11 : V1 12 : V2 13 : V3 14 : F	
547	223	1	value at 0 or 4 mA from output analog OUT 4	–
548	224	1	unit at 0 or 4 mA from output analog OUT 4 0 : / 1 : k 2 : M	–
549	225	1	value at 20 mA from output analog OUT 4	–
550	226	1	unit at 20 mA from output analog OUT 4 0 : / 1 : k 2 : M	–
551	227	1	allocation OUT 1 0 : command 1 : I 2 : U 3 : ΣP 4 : ΣQ 5 : ΣS 6 : F 7 : ΣFP 8 : thd 3I 9 : thd 3U 10 : IN 11 : time 12 : V 13 : thd In 14 : thd 3V 15 : -ΣP 16 : -ΣQ 17 : CFP	–
552	228	1	lower threshold OUT 1	–
553	229	1	lower threshold unit OUT 1 0 : / 1 : k 2 : M	–
554	22A	1	upper threshold OUT 1	–
555	22B	1	upper threshold unit OUT 1 0 : / 1 : k 2 : M	–
556	22C	1	hysteresis 0 to 99 OUT 1	%
557	22D	1	specified time OUT 1	sec
558	22E	1	relay status OUT 1 0 : Open 1 : Closed	–
559	22F	1	allocation OUT 2 0 : Command 1 : I 2 : U 3 : +ΣP 4 : +ΣQ 5 : ΣS 6 : F	–

Decimal address	Hexa. address	N° of words	Text	Unit
			7 : LPF 8 : thd 3I 9 : thd 3U 10 : IN 11 : time 12 : V 13 : thd In 14 : thd 3V 15 : -ΣP 16: -ΣQ 17: CFP	
560	230	1	lower threshold OUT 2	–
561	231	1	lower threshold unit OUT 2 0 : / 1 : k 2 : M	–
562	232	1	upper threshold OUT 2	–
563	233	1	upper threshold unit OUT 2 0 : / 1 : k 2 : M	–
564	234	1	hysteresis 0 to 99 OUT 2	%
565	235	1	time delay OUT 2	sec
566	236	1	relay status OUT 2 0 : Open 1 : Closed	–
567	237	1	relay status 3 : 0 : Open 1 : Closed	–
568	238	1	relay status 4 : 0 : Open 1 : Closed	–
569	239	1	relay status 5 : 0 : Open 1 : Closed	–
570	23A	1	relay status 6 : 0 : Open 1 : Closed	–
571	23B	1	Secondary of neutral CT : 1 : 1 A 5 : 5 A	A
572	23C	1	Primary of neutral CT	A

Size of this zone: 61 words or 3D hexadecimals

Example:
Configuration of a 4-wired unbalanced network (4 LNB) for Diris number 5.

Slave	Function	High-order address	Low-order address	High-order word N°	Low-order word N°	CRC 16
05	06	02	00	00	05	49F5

Diris Ap reply: Identical to message sent

RESET TO ZERO: ENERGY METERS AND MAX. VALUES (FUNCTION 6)

NB:
To reset several parameters to zero, add the corresponding figure indicated in the “text” column.
Example: reset Max P+ and kvarh + to zero: 2 + 100 = 102 (Hex)

Decimal address	Hexad. address	N° of words	Text Hex	Unit
1024	400	1	Reset to zero for: Max3I: 1 MaxP+: 2 MaxP-: 4 MaxQ+: 8 MaxQ-: 10 MaxS: 20 Hour meter: 40 kWh+: 80 kvarh+: 100 kVA: 200 kWh-: 400 kvarh-: 800 all parameters: 1000	/
1025	401	1	R.A.Z. de : E1 : 0x1 E2 : 0x2 E3 : 0x4 E4 : 0x8 E5 : 0x10 E6 : 0x20 Min/Max I : 0x40 Min/Max In : 0x80 Min/Max U : 0x100 Min/Max F : 0x200 Min/Max PF : 0x400 Min/Max P : 0x800 Min/Max Q : 0x1000 Min/Max thd I : 0x2000 Min/Max thd In : 0x4000 Min/Max thd U : 0x8000	/

Zone size: 2 words or 2 hexadecimals

Example:
To reset all values for DIRIS number 5 to zero, the following frame should be sent:

Slave	Function	High-order address	Low-order address	High-order word N°	Low-order word N°	CRC 16
05	06	04	00	10	00	84BE

Diris A*p* reply: identical to the message sent.

SAVED COMMAND (RESET)

The following command should be done to save programming parameters changes for DIRIS number 5.

NB:
Diris Ap will not reply to this command.

Slave	Function	High-order address	Low-order address	Values	CRC 16
05	06	06	00	0000	88C6

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TECHNICAL CARACTERITICS

COMMUNICATION

RS485	2 or 3 wires half duplex
Protocol	JBUS/MODBUS® protocol / RTU mode
Speed	2400 to 38400 Bauds
Galvanic insulation	2.5 kV

Réf. : 875 516 C - 06/02

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