

KEOR COMPACT

JBUS / MODBUS Protocol

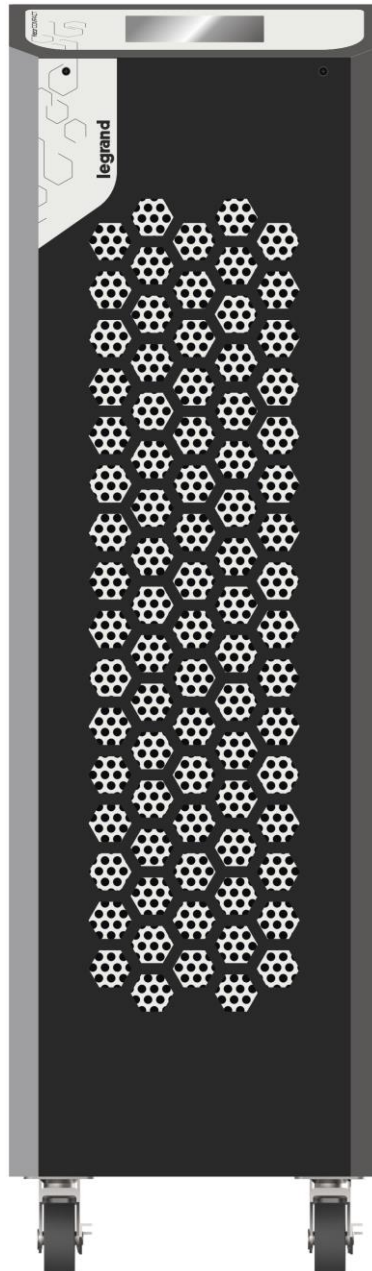


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1. Introduction

This document describes the KEOR COMPACT Series UPS protocol, adopted to communicate with all communication products, like Supervisor, Network communication, etc...

This protocol will be implemented in the KEOR COMPACT Series UPS equipment, in order to use the same driver for all products.

1.1 Communication Layers

APPLICATIONS
REMOTE MONITOR TERMINAL CENTRAL COMPUTER
DATA TABLE
FIXED
ADDRESS SPECIFICATION
PUBLIC DATA JBUS/MODBUS in RTU mode
MODBUS TRANSPORT PROTOCOL
HARDWARE
RS485

2. JBUS General Purpose

JBUS/MODBUS is a Master/Slave protocol, in which Master could be one of the 255 slaves. The master sent a request to a slaver; the slaver sent the data or an ACK to the Master.

2.1 General Message Format

SLAVE NUMBER (1 byte)	Specified the destination node
FUNCTION CODE (1 byte)	Specified a READ or WRITE data command
DATA FIELD	Information to read or write data (Address, value, number of data...)
CONTROL WORD (CRC16) (2 bytes, 1 word)	Algorithm calculation of each data

➤ The JBUS/MODBUS protocol includes various functions that are intended for collecting information in different ways. As follows:

Function (03h) for reading registers.

Function (06h) for 1 word writing registers.

Remark: 1 Address = 16 bits or 1 Word (LSB and MSB)

2.2 JBUS/MODBUS protocol

2.2.1 Function description

✓ Function 0x03

Master request: 8 bytes

Slave Number	Function	Address High	Address Low	0	Nb of word to read	CRC Low	CRC High
1	0x03	0xE0	0x00	0	10		

Ex. Request to slave number1, the data (10 words) beginning at 0xE000 (Address)

Slave Message:

Slave Number	Function	Nb of byte	First data hi byte	First data low byte	Next data	CRC Low	CRC High
1	0x03	20	0x20	0x02		

Example: the first data is $(0x20 * 256) + 0x02 = 0x2002$

✓ FUNCTION 0x06

This function is used to send a command to the slave.

Slave Number	Function	Address High	Address Low	data to write high byte	data to write low byte	CRC Low	CRC High
1	0x06	0xE0	0x10	0x30	0x03		

Slave message:

Slave Number	Function	Address High	Address Low	data to write high byte	data to write low byte	CRC Low	CRC High
1	0x06	0xE0	0x10	0x30	0x03		

The slave sends the same message if not error occurred.

2.3 Data decoding

➤ Status and alarms Information

The information are coding in bit. This means that 1 word defines 16 information.

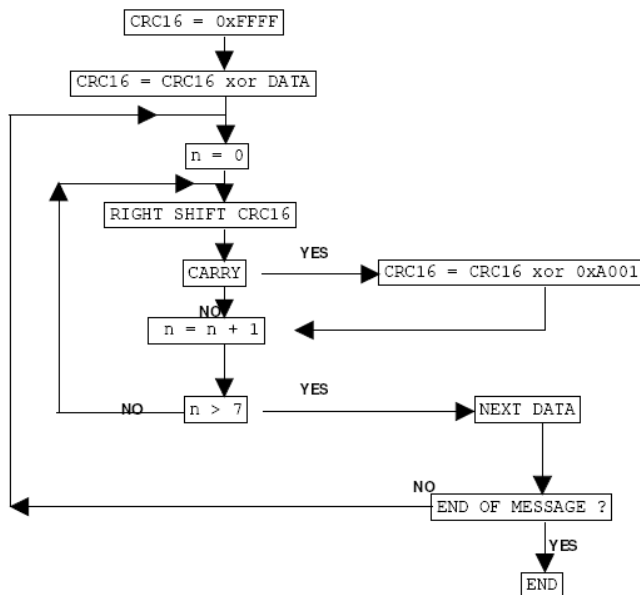
➤ Measurements data

1 word defines a measurement. Some values are numeric decimal signed or unsigned (0 to 65535 or from -32767 to 32767).

2.4 Acknowledgement of end of data package

A time-out equal to a value of $10 * \text{time of transmission of a character}$, points out that the data package is finished (the CRC has been sent).

2.4.1 CRC 16 CALCULATION



2.4.2 Example of CRC calculation

```

unsigned int CALCUL_CRC(unsigned int *Msg)
{
  unsigned int Crc;
  int lenght,i,n;
  Crc = 0xFFFF;
  lenght = Msg[0];
  for ( i = 1 ; i <= lenght ; i++ )
  {
    Crc ^= Msg[i];
    for ( n = 1 ; n <= 8 ; n++ )
    {
      /* if CRC is even */
      if ((Crc % 2) == 0)
      /* to right decrement */
      Crc >>= 1;
      else
      {
        Crc >>= 1;
        Crc ^= 0xA001;
      }
    }
  }
  return( Crc );
}
  
```

3. Definition of the JBUS/MODBUS protocol

3.1 General data structure

JBUS/MODBUS-table		
Index	Table	JBUS/MODBUS Function
1	Status	03h READ
2	Alarms	03h READ

3	Measurement	03h READ
4	Control	06h WRITE
5	Configurations	03h READ

➤ Incoming data structure

Example of 4 words							
1	2	3	4	5	6	7	8
MSB0	LSB0	MSB0	LSB0	MSB0	LSB0	MSB0	LSB0
Bit15	Bit0	Bit15	Bit0	Bit15	Bit0	Bit15	Bit0
WORD0		WORD1		WORD2		WORD3	
Status15	Status0	Status31	Status16	Status47	Status32	Status63	Status48
Alarm15	Alarm0	Alarm31	Alarm16	Alarm47	Alarm32	Alarm63	Alarm48
M00		M01		M02		M03	

4. JBUS interface in Unit system configuratio

4.1 General data area

Index	Table	Start addresses	Table length in words	JBUS/MODBUS Function
1	UPS Status	0xn000	8	03h READ
2	UPS Alarms	0xn010	10	03h READ
3	UPS Measurement	0xn030	97	03h READ
4	UPS Control	0xn0D0	1	06h WRITE
5	UPS Configurations	0xn1EC	2	03h READ

Remark: n = (number of unit ID + 1).

Remark: The UPS Information table should be read word by word or per group, without exceed the length of the table.

4.2 UPS Status data area

STATUS : Address from 0xn000, 10 WORDS

Code	Description	BIT	Address
S00	Rectifier Input Present OK	0	0xn000
S01	Bypass Input Present OK	1	0xn000
S02	RESERVED	2	0xn000
S03	RESERVED	3	0xn000
S04	RESERVED	4	0xn000
S05	UPS in Normal Mode	5	0xn000
S06	RESERVED	6	0xn000

S07	UPS in ECO Mode	7	0xn000
S08	UPS in Converter Mode	8	0xn000
S09	RESERVED	9	0xn000
S10	RESERVED	10	0xn000
S11	RESERVED	11	0xn000
S12	RESERVED	12	0xn000
S13	RESERVED	13	0xn000
S14	Rectifier on	14	0xn000
S15	Inverter on	15	0xn000
S16	Battery Discharger on	0	0xn001
S17	Battery Charger on	1	0xn001
S18	RESERVED	2	0xn001
S19	RESERVED	3	0xn001
S20	RESERVED	4	0xn001
S21	Load off	5	0xn001
S22	Load on Inverter	6	0xn001
S23	Load on Bypass	7	0xn001
S24	Load on Manual bypass	8	0xn001
S25	Permission for ECO mode aux supply	9	0xn001
S26	RESERVED	10	0xn001
S27	RESERVED	11	0xn001
S28	RESERVED	12	0xn001
S29	RESERVED	13	0xn001
S30	Inverter Sync. With Bypass	14	0xn001
S31	RESERVED	15	0xn001
S32	RESERVED	0	0xn002
S33	Unitary Operation	1	0xn002
S34	Parallel Operation	2	0xn002
S35	Redundancy Operation	3	0xn002
S36	RESERVED	4	0xn002
S37	RESERVED	5	0xn002
S38	RESERVED	6	0xn002
S39	RESERVED	7	0xn002
S40	Vbatt. Ok	8	0xn002
S41	Vbatt. Low	9	0xn002
S42	Vbatt. Min	10	0xn002
S43	ESS Discharging	11	0xn002
S44	ESS Schedule Set	12	0xn002

S45	ESS Waiting for Process	13	0xn002
S46	ESS can be Executed	14	0xn002
S47	ESS Battery Energy Storage Limited	15	0xn002
S48	Battery Charging Compensation	0	0xn003
S49	RESERVED	1	0xn003
S50	Battery Precharge Kit Available	2	0xn003
S51	Permission for Close Battery Switch	3	0xn003
S52	Cold Start Ready	4	0xn003
S53	RESERVED	5	0xn003
S54	RESERVED	6	0xn003
S55	RESERVED	7	0xn003
S56	RESERVED	8	0xn003
S57	RESERVED	9	0xn003
S58	RESERVED	10	0xn003
S59	RESERVED	11	0xn003
S60	Shutdown Active	12	0xn003
S61	Buzzer Enable	13	0xn003
S62	Remote Control Enable	14	0xn003
S63	Automatic Restart Enable	15	0xn003
S64	RESERVED	0	0xn004
S65	RESERVED	1	0xn004
S66	RESERVED	2	0xn004
S67	Manual Bypass Switch Closed	3	0xn004
S68	RESERVED	4	0xn004
S69	Output Switch Closed	5	0xn004
S70	RESERVED	6	0xn004
S71	Bypass SCR Activated	7	0xn004
S72	Battery Switch Closed	8	0xn004
S73	RESERVED	9	0xn004
S74	RESERVED	10	0xn004
S75	RESERVED	11	0xn004
S76	Input Contactor Closed	12	0xn004
S77	Output Contactor Closed	13	0xn004
S78	Cold Start contactor Closed	14	0xn004
S79	Rectifier Precharge Relay Closed	15	0xn004
S80	Cold Start Precharge Relay Closed	0	0xn005
S81	RESERVED	1	0xn005
S82	RESERVED	2	0xn005

S83	RESERVED	3	0xn005
S84	Unit is Master	4	0xn005
S85	Unit is Slave	5	0xn005
S86	RESERVED	6	0xn005
S87	RESERVED	7	0xn005
S88	RESERVED	8	0xn005
S89	RESERVED	9	0xn005
S90	RESERVED	10	0xn005
S91	RESERVED	11	0xn005
S92	RESERVED	12	0xn005
S93	RESERVED	13	0xn005
S94	RESERVED	14	0xn005
S95	RESERVED	15	0xn005
S96	RESERVED	0	0xn006
S97	RESERVED	1	0xn006
S98	RESERVED	2	0xn006
S99	RESERVED	3	0xn006
S100	RESERVED	4	0xn006
S101	RESERVED	5	0xn006
S102	RESERVED	6	0xn006
S103	RESERVED	7	0xn006
S104	RESERVED	8	0xn006
S105	RESERVED	9	0xn006
S106	RESERVED	10	0xn006
S107	RESERVED	11	0xn006
S108	RESERVED	12	0xn006
S109	RESERVED	13	0xn006
S110	Slot1 Relay Card Present ⁽¹⁾	14	0xn006
S111	Slot2 Relay Card Present ⁽¹⁾	15	0xn006
S112	Slot1 Output Relay 1 Activated ⁽¹⁾	0	0xn007
S113	Slot1 Output Relay 2 Activated ⁽¹⁾	1	0xn007
S114	Slot1 Output Relay 3 Activated ⁽¹⁾	2	0xn007
S115	Slot1 Output Relay 4 Activated ⁽¹⁾	3	0xn007
S116	Slot1 Output Relay 5 Activated ⁽¹⁾	4	0xn007
S117	Slot1 Output Relay 6 Activated ⁽¹⁾	5	0xn007
S118	Slot2 Output Relay 1 Activated ⁽¹⁾	6	0xn007
S119	Slot2 Output Relay 2 Activated ⁽¹⁾	7	0xn007
S120	Slot2 Output Relay 3 Activated ⁽¹⁾	8	0xn007

S121	Slot2 Output Relay 4 Activated ⁽¹⁾	9	0xn007
S122	Slot2 Output Relay 5 Activated ⁽¹⁾	10	0xn007
S123	Slot2 Output Relay 6 Activated ⁽¹⁾	11	0xn007
S124	RESERVED	12	0xn007
S125	RESERVED	13	0xn007
S126	RESERVED	14	0xn007
S127	RESERVED	15	0xn007
S128	RESERVED	0	0xn008
S129	RESERVED	1	0xn008
S130	RESERVED	2	0xn008
S131	RESERVED	3	0xn008
S132	RESERVED	4	0xn008
S133	RESERVED	5	0xn008
S134	RESERVED	6	0xn008
S135	RESERVED	7	0xn008
S136	RESERVED	8	0xn008
S137	RESERVED	9	0xn008
S138	RESERVED	10	0xn008
S139	RESERVED	11	0xn008
S140	RESERVED	12	0xn008
S141	RESERVED	13	0xn008
S142	RESERVED	14	0xn008
S143	RESERVED	15	0xn008
S144	Schedule Battery Test Process Permitted	0	0xn009
S145	Manual Battery Test Process Permitted	1	0xn009
S146	After Battery Test, Battery is Aging	2	0xn009
S147	After Battery Test, Battery Pass	3	0xn009
S148	Battery Test Fail	4	0xn009
S149	Battery Test in Progress	5	0xn009
S150	Battery Test Condition Incompatible	6	0xn009
S151	Waiting for The Battery Test Process	7	0xn009
S152	Manual Battery Test Time is Limited in 2 Minutes	8	0xn009
S153	RESERVED	9	0xn009
S154	RESERVED	10	0xn009
S155	RESERVED	11	0xn009
S156	Energy Saver Enable	12	0xn009

S157	Energy Saver On	13	0xn009
S158	Energy Saver is Operating	14	0xn009
S159	Unit is Standing by	15	0xn009

Note. Status with “RESERVED” are not usable in KEOR COMPACT Series protocol.

⁽¹⁾ Optional function for Relay Card.

4.3 UPS Alarms data area

ALARMS : Address from 0xn010, 10 WORDS

Code	Description	BIT	Address
A00	RESERVED	0	0xn010
A01	General Alarm	1	0xn010
A02	Inverter General Alarm	2	0xn010
A03	Mains General Alarm	3	0xn010
A04	Discharger General Alarm	4	0xn010
A05	Charger General Alarm	5	0xn010
A06	Bypass General Alarm	6	0xn010
A07	RESERVED	7	0xn010
A08	RESERVED	8	0xn010
A09	RESERVED	9	0xn010
A10	Over Temp.	10	0xn010
A11	RESERVED	11	0xn010
A12	RESERVED	12	0xn010
A13	RESERVED	13	0xn010
A14	Interior over Temp.	14	0xn010
A15	Battery Room over Temp.	15	0xn010
A16	Converter Stop Due To UPS Overheat	0	0xn011
A17	RESERVED	1	0xn011
A18	RESERVED	2	0xn011
A19	RESERVED	3	0xn011
A20	RESERVED	4	0xn011
A21	RESERVED	5	0xn011
A22	RESERVED	6	0xn011
A23	RESERVED	7	0xn011
A24	RESERVED	8	0xn011
A25	Inverter Fault	9	0xn011
A26	Rectifier Fault	10	0xn011
A27	Discharger Fault	11	0xn011
A28	Charger Fault	12	0xn011

A29	Bypass SCR Fault	13	0xn011
A30	Fan out of Order	14	0xn011
A31	Temp. Sensor Disconnected	15	0xn011
A32	RESERVED	0	0xn012
A33	RESERVED	1	0xn012
A34	RESERVED	2	0xn012
A35	RESERVED	3	0xn012
A36	RESERVED	4	0xn012
A37	RESERVED	5	0xn012
A38	RESERVED	6	0xn012
A39	RESERVED	7	0xn012
A40	RESERVED	8	0xn012
A41	RESERVED	9	0xn012
A42	RESERVED	10	0xn012
A43	RESERVED	11	0xn012
A44	RESERVED	12	0xn012
A45	RESERVED	13	0xn012
A46	Mains Input out of Tolerance	14	0xn012
A47	Mains Input Disconnected or Fuse Open	15	0xn012
A48	Mains Input Phase Rotation Error	0	0xn013
A49	Mains Input 3 Phase Current Unbalance	1	0xn013
A50	Mains Input Voltage Low	2	0xn013
A51	RESERVED	3	0xn013
A52	RESERVED	4	0xn013
A53	RESERVED	5	0xn013
A54	RESERVED	6	0xn013
A55	RESERVED	7	0xn013
A56	RESERVED	8	0xn013
A57	RESERVED	9	0xn013
A58	Inverter Output Voltage out of Tolerance	10	0xn013
A59	Output Contactor Broken or Output Fuse Open	11	0xn013
A60	Inverter Output DC Offset too High	12	0xn013
A61	Output Short Circuit	13	0xn013
A62	RESERVED	14	0xn013
A63	RESERVED	15	0xn013
A64	RESERVED	0	0xn014
A65	RESERVED	1	0xn014

A66	RESERVED	2	0xn014
A67	RESERVED	3	0xn014
A68	RESERVED	4	0xn014
A69	Bypass Short Circuit	5	0xn014
A70	Bypass Preventive Alarm	6	0xn014
A71	Bypass Critical Alarm	7	0xn014
A72	Bypass Phase Rotation Error	8	0xn014
A73	Bypass Phase Error	9	0xn014
A74	Backfeed Protection Active	10	0xn014
A75	RESERVED	11	0xn014
A76	Lock on Bypass	12	0xn014
A77	RESERVED	13	0xn014
A78	Bypass out of THD Tolerance	14	0xn014
A79	RESERVED	15	0xn014
A80	RESERVED	0	0xn015
A81	RESERVED	1	0xn015
A82	Battery Disconnected or Fuse Open	2	0xn015
A83	Vbatt. Min	3	0xn015
A84	Vbatt. Low	4	0xn015
A85	Battery over Voltage	5	0xn015
A86	Charger over Current	6	0xn015
A87	ESS interrupted due to abnormal conditions	7	0xn015
A88	ESS interrupted due to low battery setting voltage	8	0xn015
A89	RESERVED	9	0xn015
A90	Inverter Overload	10	0xn015
A91	Bypass Overload	11	0xn015
A92	UPS Overload Shutdown	12	0xn015
A93	RESERVED	13	0xn015
A94	System Occurred Unpredictable Interrupt Output	14	0xn015
A95	Rectifier Rating down to 50%	15	0xn015
A96	Transfer Impossible	0	0xn016
A97	Output Switch Open	1	0xn016
A98	RESERVED	2	0xn016
A99	RESERVED	3	0xn016
A100	Manual Bypass Aalarm	4	0xn016

A101	Battery Near End of Life	5	0xn016
A102	UPS Maintenance Alarm	6	0xn016
A103	Internal Clock Alarm	7	0xn016
A104	RESERVED	8	0xn016
A105	RESERVED	9	0xn016
A106	RESERVED	10	0xn016
A107	RESERVED	11	0xn016
A108	RESERVED	12	0xn016
A109	RESERVED	13	0xn016
A110	RESERVED	14	0xn016
A111	RESERVED	15	0xn016
A112	RESERVED	0	0xn017
A113	RESERVED	1	0xn017
A114	RESERVED	2	0xn017
A115	RESERVED	3	0xn017
A116	RESERVED	4	0xn017
A117	RESERVED	5	0xn017
A118	RESERVED	6	0xn017
A119	RESERVED	7	0xn017
A120	RESERVED	8	0xn017
A121	RESERVED	9	0xn017
A122	RESERVED	10	0xn017
A123	RESERVED	11	0xn017
A124	RESERVED	12	0xn017
A125	RESERVED	13	0xn017
A126	RESERVED	14	0xn017
A127	RESERVED	15	0xn017
A128	RESERVED	0	0xn018
A129	RESERVED	1	0xn018
A130	RESERVED	2	0xn018
A131	RESERVED	3	0xn018
A132	EPO(emergency power off) active	4	0xn018
A133	External Alarm 1 Activated ⁽¹⁾	5	0xn018
A134	External Alarm 2 Activated ⁽¹⁾	6	0xn018
A135	External Alarm 3 Activated ⁽¹⁾	7	0xn018
A136	External Alarm 4 Activated ⁽¹⁾	8	0xn018
A137	External Alarm 5 Activated ⁽¹⁾	9	0xn018
A138	External Alarm 6 Activated ⁽¹⁾	10	0xn018

A139	External Alarm 7 Activated ⁽¹⁾	11	0xn018
A140	External Alarm 8 Activated ⁽¹⁾	12	0xn018
A141	External Alarm 9 Activated ⁽¹⁾	13	0xn018
A142	External Alarm 10 Activated ⁽¹⁾	14	0xn018
A143	External Alarm 11 Activated ⁽¹⁾	15	0xn018
A144	External Alarm 12 Activated ⁽¹⁾	0	0xn019
A145	RESERVED	1	0xn019
A146	RESERVED	2	0xn019
A147	RESERVED	3	0xn019
A148	RESERVED	4	0xn019
A149	RESERVED	5	0xn019
A150	RESERVED	6	0xn019
A151	RESERVED	7	0xn019
A152	RESERVED	8	0xn019
A153	RESERVED	9	0xn019
A154	RESERVED	10	0xn019
A155	RESERVED	11	0xn019
A156	RESERVED	12	0xn019
A157	RESERVED	13	0xn019
A158	RESERVED	14	0xn019
A159	RESERVED	15	0xn019

Note. Status with “RESERVED” are not usable in KEOR COMPACT Series protocol.

⁽¹⁾ Optional function for Relay Card.

4.4 UPS Measurement area

Information : Address from 0xn030, 121 WORDS

Code	Description	Unit	Address	Data Format
M00	Input voltage R ⁽¹⁾	V*10	0xn030	###.#
M01	Input voltage S ⁽¹⁾	V*10	0xn031	###.#
M02	Input voltage T ⁽¹⁾	V*10	0xn032	###.#
M03	Input R-S Voltage ⁽¹⁾	V*10	0xn033	###.#
M04	Input S-T Voltage ⁽¹⁾	V*10	0xn034	###.#
M05	Input T-R Voltage ⁽¹⁾	V*10	0xn035	###.#
M06	Input frequency	Hz*10	0xn036	##.#
M07	Input current R ⁽¹⁾	A*10	0xn037	###.#
M08	Input current S ⁽¹⁾	A*10	0xn038	###.#
M09	Input current T ⁽¹⁾	A*10	0xn039	###.#
M10	Output voltage R ⁽²⁾	V*10	0xn03A	###.#

M11	Output voltage S ⁽²⁾	V*10	0xn03B	###.#
M12	Output voltage T ⁽²⁾	V*10	0xn03C	###.#
M13	Output R-S Voltage ⁽²⁾	V*10	0xn03D	###.#
M14	Output S-T Voltage ⁽²⁾	V*10	0xn03E	###.#
M15	Output T-R Voltage ⁽²⁾	V*10	0xn03F	###.#
M16	Output frequency	Hz*10	0xn040	##.#
M17	Output current R ⁽²⁾	A*10	0xn041	##.#
M18	Output current S ⁽²⁾	A*10	0xn042	##.#
M19	Output current T ⁽²⁾	A*10	0xn043	##.#
M20	Output active power phase R	kW*10	0xn044	##.#
M21	Output active power phase S	kW*10	0xn045	##.#
M22	Output active power phase T	kW*10	0xn046	##.#
M23	Output active power total	kW*10	0xn047	##.#
M24	Output apparent power phase R	kVA*10	0xn048	##.#
M25	Output apparent power phase S	kVA*10	0xn049	##.#
M26	Output apparent power phase T	kVA*10	0xn04A	##.#
M27	Output apparent power total	kVA*10	0xn04B	##.#
M28	Output power factor R	*100	0xn04C	###
M29	Output power factor S	*100	0xn04D	###
M30	Output power factor T	*100	0xn04E	###
M31	Input Bypass voltage R ⁽¹⁾	V*10	0xn04F	###.#
M32	Input Bypass voltage S ⁽¹⁾	V*10	0xn050	###.#
M33	Input Bypass voltage T ⁽¹⁾	V*10	0xn051	###.#
M34	Bypass R-S Voltage ⁽¹⁾	V*10	0xn052	###.#
M35	Bypass S-T Voltage ⁽¹⁾	V*10	0xn053	###.#
M36	Bypass T-R Voltage ⁽¹⁾	V*10	0xn054	###.#
M37	Input Bypass frequency	Hz*10	0xn055	##.#
M38	Load rate R	%	0xn056	###
M39	Load rate S	%	0xn057	###
M40	Load rate T	%	0xn058	###
M41	RESERVED			
M42	RESERVED			
M43	RESERVED			
M44	RESERVED			
M45	RESERVED			
M46	RESERVED			
M47	RESERVED			
M48	RESERVED			

M49	RESERVED			
M50~M54	RESERVED			
M55	Inverter overload counter		0xn068	#####
M56	Bypass overload counter		0xn069	#####
M57	RESERVED			
M58	RESERVED			
M59	RESERVED			
M60	RESERVED			
M61	RESERVED			
M62	RESERVED			
M63	RESERVED			
M64	Battery remaining capacity	%*10	0xn070	##.#
M65	RESERVED			
M66	Remaining run time	Min*1	0xn072	###
M67	Positive total battery voltage	V*100	0xn073	###.###
M68	Negative total battery voltage	V*100	0xn074	###.###
M69	Positive battery voltage per cell	V*100	0xn075	#.###
M70	Negative battery voltage per cell	V*100	0xn076	#.###
M71	Charging watt	kW*100	0xn077	###.###
M72	Discharging watt	kW*100	0xn078	###.###
M73	Positive battery charger current	A*100	0xn079	###.###
M74	Negative battery charger current	A*100	0xn07A	###.###
M75	Positive battery discharger current	A*100	0xn07B	###.###
M76	Negative battery discharger current	A*100	0xn07C	###.###
M77	RESERVED			
M78	RESERVED			
M79	RESERVED			
M80	Rectifier T1 temperature	°C*10 ⁽³⁾	0xn080	##.#
M81	RESERVED	°C*10 ⁽³⁾	0xn081	##.#
M82	Rectifier T2 temperature	°C*10 ⁽³⁾	0xn082	##.#
M83	Inverter T1 temperature	°C*10 ⁽³⁾	0xn083	##.#
M84	RESERVED	°C*10 ⁽³⁾	0xn084	##.#
M85	Inverter T2 temperature	°C*10 ⁽³⁾	0xn085	##.#
M86	Bypass temperature	°C*10 ⁽³⁾	0xn086	##.#
M87	RESERVED	°C*10 ⁽³⁾	0xn087	##.#
M88	RESERVED	°C*10 ⁽³⁾	0xn088	##.#
M89	DC converter 1 temperature	°C*10 ⁽³⁾	0xn089	##.#
M90	DC converter 2 temperature	°C*10 ⁽³⁾	0xn08A	##.#

M91	Inner system temperature	°C*10 ⁽³⁾	0xn08B	##.#
M92	Battery chamber temperature	°C*10 ⁽³⁾	0xn08C	##.#
M93	Input Bypass current R ⁽¹⁾	A*10	0xn08D	###.#
M94	Input Bypass current S ⁽¹⁾	A*10	0xn08E	###.#
M95	Input Bypass current T ⁽¹⁾	A*10	0xn08F	###.#
M96	RESERVED			
M97	RESERVED			
M98	RESERVED			
M99	RESERVED			
M100	RESERVED			
M101~M119	RESERVED			
M120	Rectifier input active power	kW*10	0xn0A8	###.#

Note. Status with “RESERVED” are not usable in KEOR COMPACT Series protocol.

⁽¹⁾ This Information needs to be transferred if “Input transformer” is existing.

- Displayed Mains Voltage = (Input Voltage * Input transformer ratio).
- Displayed Mains Current = (Input current / Input transformer ratio).
- Displayed Bypass Voltage = (Input Bypass Voltage * Input transformer ratio).
- Displayed Bypass Current = (Input Bypass current / Input transformer ratio).

Note. “Input transformer ratio (T44)” settings please refers to chapter 4.6.

⁽²⁾ This Information needs to be transferred if “Output transformer” is existing.

- Displayed Output Voltage = (Output Voltage * Output transformer ratio).
- Displayed Output Current = (Output current / Output transformer ratio).

Note. “Output transformer ratio (T45)” settings please refers to chapter 4.6

⁽³⁾ Displayed with a minus sign.

4.5 UPS Control area

Following code must be written into 0xn0D0 vector index address. The commands are coded by a decimal value. Different value defined different command in word type.

Commands: Address: 0xn0D0, 1word.

Code	Description	Remarks
C00	Normal Mode	
C02	ECO Mode	
C03	Converter Mode	
C05	Shutdown	Immediate load off!!
C06	Load on Bypass	
C11	Buzzer Disable	
C12	Buzzer Enable	
C14	Clear Latch Alarm and Buzzer	

C256	External Alarm 1 Active ⁽¹⁾
C257	External Alarm 2 Active ⁽¹⁾
C258	External Alarm 3 Active ⁽¹⁾
C259	External Alarm 4 Active ⁽¹⁾
C260	External Alarm 5 Active ⁽¹⁾
C261	External Alarm 6 Active ⁽¹⁾
C262	External Alarm 7 Active ⁽¹⁾
C263	External Alarm 8 Active ⁽¹⁾
C264	External Alarm 9 Active ⁽¹⁾
C265	External Alarm 10 active ⁽¹⁾
C266	External Alarm 11 Active ⁽¹⁾
C267	External Alarm 12 Active ⁽¹⁾

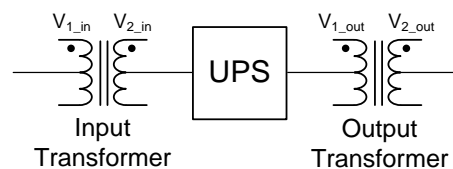
⁽¹⁾ Optional function for Relay Card.

4.6 UPS Configurations area

Information : Address from 0xn1EC, 2 WORDS

Code	Description	Unit	Address	Remarks
T44	Input transformer ratio parameter	N*100	0xn1EC	0 : No Transformer. 0~1 : Transformer ratio ⁽¹⁾
T45	Output transformer ratio parameter	N*100	0xn1ED	0 : No Transformer. 0~1 : Transformer ratio ⁽¹⁾

⁽¹⁾ Transformer ratios can be calculated as following:



$$\text{Input transformer ratio} = V_{1_in}/V_{2_in} = T44$$

$$\text{Output transformer ratio} = V_{2_out}/V_{1_out} = T45$$

5. JBUS interface in parallel system configuration

There is only one JBUS/MODBUS serial link interface for a parallel system configuration. One serial interface is used for the whole installation. The access data to the UPS unit is managed by the table addressing.

5.1 General data area

Table	Start address	Table length in words	JBUS/MODBUS function	Remark
SYS Status	0x1000	10	3 READ	See SYS part
SYS Alarm	0x1010	10	3 READ	
SYS Measurement	0x1030	78	3 READ	
SYS Command	0x10D0	1	6 WRITE	
SYS Configurations	0x111C	2	3 READ	
Status unit 1	0x2000	8	3 READ	See unit part
Alarm unit 1	0x2010	16	3 READ	
Measurement unit 1	0x2030	97	3 READ	
Command unit 1	0x20D0	1	6 WRITE	
Configurations unit 1	0x21EC	2	3 READ	
Status unit 2	0x3000	8	3 READ	See unit part
Alarm unit 2	0x3010	16	3 READ	
Measurement unit 2	0x3030	97	3 READ	
Command unit 2	0x30D0	1	6 WRITE	
Configurations unit 2	0x31EC	2	3 READ	
Status unit 3	0x4000	8	3 READ	See unit part
Alarm unit 3	0x4010	16	3 READ	
Measurement unit 3	0x4030	97	3 READ	
Command unit 3	0x40D0	1	6 WRITE	
Configurations unit 3	0x41EC	2	3 READ	
Status unit 4	0x5000	8	3 READ	See unit part
Alarm unit 4	0x5010	16	3 READ	
Measurement unit 4	0x5030	97	3 READ	
Command unit 4	0x50D0	1	6 WRITE	
Configurations unit 4	0x51EC	2	3 READ	
Status unit 5	0x6000	8	3 READ	See unit part
Alarm unit 5	0x6010	16	3 READ	
Measurement unit 5	0x6030	97	3 READ	
Command unit 5	0x60D0	1	6 WRITE	
Configurations unit 5	0x61EC	2	3 READ	

Status unit ⁶	0x7000	8	3 READ	See unit part
Alarm unit ⁶	0x7010	16	3 READ	
Measurement unit ⁶	0x7030	97	3 READ	
Command unit ⁶	0x70D0	1	6 WRITE	
Configurations unit ⁶	0x71EC	2	3 READ	

5.2 SYS Status data area

STATUS : Address from 0x1000, 10 WORDS

Code	Description	BIT	Address
S00	Rectifier Input Present OK	0	0x1000
S01	Bypass Input Present OK	1	0x1000
S02	Common Input	2	0x1000
S03	RESERVED	3	0x1000
S04	RESERVED	4	0x1000
S05	UPS in Normal Mode	5	0x1000
S06	RESERVED	6	0x1000
S07	UPS in ECO Mode	7	0x1000
S08	UPS in Converter Mode	8	0x1000
S09	RESERVED	9	0x1000
S10	RESERVED	10	0x1000
S11	RESERVED	11	0x1000
S12	RESERVED	12	0x1000
S13	RESERVED	13	0x1000
S14	Rectifier on	14	0x1000
S15	Inverter on	15	0x1000
S16	Battery Discharger on ⁽¹⁾	0	0x1001
S17	Battery Charger on ⁽¹⁾	1	0x1001
S18	RESERVED	2	0x1001
S19	RESERVED	3	0x1001
S20	RESERVED	4	0x1001
S21	Load off	5	0x1001
S22	Load on Inverter	6	0x1001
S23	Load on Bypass	7	0x1001
S24	Load on Manual Bypass	8	0x1001
S25	Permission for ECO Mode Bypass Supply	9	0x1001
S26	RESERVED	10	0x1001
S27	RESERVED	11	0x1001
S28	RESERVED	12	0x1001

S29	RESERVED	13	0x1001
S30	RESERVED	14	0x1001
S31	RESERVED	15	0x1001
S32	RESERVED	0	0x1002
S33	RESERVED	1	0x1002
S34	RESERVED	2	0x1002
S35	Redundancy operation	3	0x1002
S36	RESERVED	4	0x1002
S37	RESERVED	5	0x1002
S38	RESERVED	6	0x1002
S39	System is Common Battery	7	0x1002
S40	Vbatt. OK ⁽¹⁾	8	0x1002
S41	Vbatt. Low ⁽¹⁾	9	0x1002
S42	Vbatt. Min ⁽¹⁾	10	0x1002
S43	ESS Discharging ⁽¹⁾	11	0x1002
S44	RESERVED	12	0x1002
S45	ESS Waiting for Process ⁽¹⁾	13	0x1002
S46	RESERVED	14	0x1002
S47	RESERVED	15	0x1002
S48	RESERVED	0	0x1003
S49	RESERVED	1	0x1003
S50	RESERVED	2	0x1003
S51	Permission for Close the Battery Switch ⁽¹⁾	3	0x1003
S52	RESERVED	4	0x1003
S53	RESERVED	5	0x1003
S54	RESERVED	6	0x1003
S55	RESERVED	7	0x1003
S56	RESERVED	8	0x1003
S57	RESERVED	9	0x1003
S58	RESERVED	10	0x1003
S59	RESERVED	11	0x1003
S60	RESERVED	12	0x1003
S61	Any one of Unit's buzzer is active	13	0x1003
S62	Remote Control Enabled	14	0x1003
S63	RESERVED	15	0x1003
S64	RESERVED	0	0x1004
S65	RESERVED	1	0x1004
S66	RESERVED	2	0x1004

S67	Manual Bypass Switch Closed	3	0x1004
S68	RESERVED	4	0x1004
S69	Output Switch Closed	5	0x1004
S70	RESERVED	6	0x1004
S71	Bypass SCR Activated	7	0x1004
S72	Battery Switch Closed	8	0x1004
S73	RESERVED	9	0x1004
S74	RESERVED	10	0x1004
S75	RESERVED	11	0x1004
S76	RESERVED	12	0x1004
S77	Output Contactor Closed	13	0x1004
S78	RESERVED	14	0x1004
S79	RESERVED	15	0x1004
S80	RESERVED	0	0x1005
S81	RESERVED	1	0x1005
S82	RESERVED	2	0x1005
S83	RESERVED	3	0x1005
S84	RESERVED	4	0x1005
S85	RESERVED	5	0x1005
S86	Unit 1 present	6	0x1005
S87	Unit 2 present	7	0x1005
S88	Unit 3 present	8	0x1005
S89	Unit 4 present	9	0x1005
S90	Unit 5 present	10	0x1005
S91	Unit 6 present	11	0x1005
S92	RESERVED	12	0x1005
S93	RESERVED	13	0x1005
S94	RESERVED	14	0x1005
S95	RESERVED	15	0x1005
S96	RESERVED	0	0x1006
S97	RESERVED	1	0x1006
S98	RESERVED	2	0x1006
S99	RESERVED	3	0x1006
S100	Unit 1 Operating	4	0x1006
S101	Unit 2 Operating	5	0x1006
S102	Unit 3 Operating	6	0x1006
S103	Unit 4 Operating	7	0x1006
S104	Unit 5 Operating	8	0x1006

S105	Unit 6 Operating	9	0x1006
S106	RESERVED	10	0x1006
S107	RESERVED	11	0x1006
S108	Comm. Board 1 Present	12	0x1006
S109	Comm. Board 2 Present	13	0x1006
S110	Comm. Board 3 Present	14	0x1006
S111	Comm. Board 4 Present	15	0x1006
S112	Comm. Board 5 Present	0	0x1007
S113	Comm. Board 6 Present	1	0x1007
S114	RESERVED	2	0x1007
S115	RESERVED	3	0x1007
S116	RESERVED	4	0x1007
S117	RESERVED	5	0x1007
S118	RESERVED	6	0x1007
S119	RESERVED	7	0x1007
S120	RESERVED	8	0x1007
S121	RESERVED	9	0x1007
S122	RESERVED	10	0x1007
S123	RESERVED	11	0x1007
S124	Schedule Condition Not Met	12	0x1007
S125	RESERVED	13	0x1007
S126	RESERVED	14	0x1007
S127	RESERVED	15	0x1007
S128	RESERVED	0	0x1008
S129	RESERVED	1	0x1008
S130	RESERVED	2	0x1008
S131	RESERVED	3	0x1008
S132	RESERVED	4	0x1008
S133	RESERVED	5	0x1008
S134	RESERVED	6	0x1008
S135	RESERVED	7	0x1008
S136	RESERVED	8	0x1008
S137	RESERVED	9	0x1008
S138	RESERVED	10	0x1008
S139	RESERVED	11	0x1008
S140	RESERVED	12	0x1008
S141	RESERVED	13	0x1008
S142	RESERVED	14	0x1008

S143	RESERVED	15	0x1008
S144	Schedule Battery Test Process Permitted ⁽¹⁾	0	0x1009
S145	Manual Battery Test Process Permitted ⁽¹⁾	1	0x1009
S146	After Battery Test, Battery is Aging ⁽¹⁾	2	0x1009
S147	After Battery Test, Battery Pass ⁽¹⁾	3	0x1009
S148	Battery Test Fail ⁽¹⁾	4	0x1009
S149	Battery Test in Progress ⁽¹⁾	5	0x1009
S150	Battery Test Condition Incompatible ⁽¹⁾	6	0x1009
S151	Waiting for The Battery Test Process	7	0x1009
S152	Manual Battery Test Time is Limited in 2 Minutes	8	0x1009
S153	RESERVED	9	0x1009
S154	RESERVED	10	0x1009
S155	RESERVED	11	0x1009
S156	Energy Saver Enable	12	0x1009
S157	Energy Saver On	13	0x1009
S158	Energy Saver is Operating	14	0x1009
S159	Any Unit has Standing by	15	0x1009

Note. Status with “RESERVED” are not usable in KEOR COMPACT Series protocol.

⁽¹⁾ Optional function for Common Battery.

5.3 SYS Alarm data area

Alarms : Address from 0x1010, 16 WORDS

Code	Description	BIT	Address
A00	RESERVED	0	0x1010
A01	Any Unit has General Alarm	1	0x1010
A02	Any Unit has Inverter General Alarm	2	0x1010
A03	Any Unit has Mains General Alarm	3	0x1010
A04	Any Unit has Discharger General Alarm	4	0x1010
A05	Any Unit has Charger General Alarm	5	0x1010
A06	Any Unit has Bypass General Alarm	6	0x1010
A07	RESERVED	7	0x1010
A08	RESERVED	8	0x1010
A09	RESERVED	9	0x1010
A10	Any Unit has Over Temp.	10	0x1010
A11	RESERVED	11	0x1010
A12	RESERVED	12	0x1010
A13	RESERVED	13	0x1010

A14	RESERVED	14	0x1010
A15	RESERVED	15	0x1010
A16	Unit 1 General Alarm	0	0x1011
A17	Unit 2 General Alarm	1	0x1011
A18	Unit 3 General Alarm	2	0x1011
A19	Unit 4 General Alarm	3	0x1011
A20	Unit 5 General Alarm	4	0x1011
A21	Unit 6 General Alarm	5	0x1011
A22	RESERVED	6	0x1011
A23	RESERVED	7	0x1011
A24	RESERVED	8	0x1011
A25	Any Unit has Inverter Fault	9	0x1011
A26	Any Unit has Rectifier Fault	10	0x1011
A27	RESERVED	11	0x1011
A28	RESERVED	12	0x1011
A29	Any Unit has Bypass SCR Fault	13	0x1011
A30	RESERVED	14	0x1011
A31	RESERVED	15	0x1011
A32	RESERVED	0	0x1012
A33	RESERVED	1	0x1012
A34	RESERVED	2	0x1012
A35	RESERVED	3	0x1012
A36	RESERVED	4	0x1012
A37	RESERVED	5	0x1012
A38	RESERVED	6	0x1012
A39	RESERVED	7	0x1012
A40	RESERVED	8	0x1012
A41	RESERVED	9	0x1012
A42	RESERVED	10	0x1012
A43	RESERVED	11	0x1012
A44	RESERVED	12	0x1012
A45	RESERVED	13	0x1012
A46	RESERVED	14	0x1012
A47	RESERVED	15	0x1012
A48	RESERVED	0	0x1013
A49	RESERVED	1	0x1013
A50	RESERVED	2	0x1013
A51	RESERVED	3	0x1013

A52	RESERVED	4	0x1013
A53	RESERVED	5	0x1013
A54	RESERVED	6	0x1013
A55	RESERVED	7	0x1013
A56	RESERVED	8	0x1013
A57	RESERVED	9	0x1013
A58	RESERVED	10	0x1013
A59	RESERVED	11	0x1013
A60	RESERVED	12	0x1013
A61	RESERVED	13	0x1013
A62	RESERVED	14	0x1013
A63	RESERVED	15	0x1013
A64	RESERVED	0	0x1014
A65	RESERVED	1	0x1014
A66	RESERVED	2	0x1014
A67	RESERVED	3	0x1014
A68	RESERVED	4	0x1014
A69	RESERVED	5	0x1014
A70	RESERVED	6	0x1014
A71	RESERVED	7	0x1014
A72	RESERVED	8	0x1014
A73	RESERVED	9	0x1014
A74	RESERVED	10	0x1014
A75	RESERVED	11	0x1014
A76	RESERVED	12	0x1014
A77	RESERVED	13	0x1014
A78	RESERVED	14	0x1014
A79	RESERVED	15	0x1014
A80	RESERVED	0	0x1015
A81	RESERVED	1	0x1015
A82	RESERVED	2	0x1015
A83	Vbatt. Min ⁽¹⁾	3	0x1015
A84	Vbatt. Low ⁽¹⁾	4	0x1015
A85	RESERVED	5	0x1015
A86	RESERVED	6	0x1015
A87	ESS interrupted due to abnormal conditions	7	0x1015
A88	RESERVED	8	0x1015
A89	RESERVED	9	0x1015

A90	Inverter Overload	10	0x1015
A91	Bypass Overload	11	0x1015
A92	UPS Overload Ohutdown	12	0x1015
A93	RESERVED	13	0x1015
A94	System Occurred Unpredictable Interrupt Output	14	0x1015
A95	Rectifier rating down to 50%	15	0x1015
A96	RESERVED	0	0x1016
A97	Output Switch Open	1	0x1016
A98	RESERVED	2	0x1016
A99	RESERVED	3	0x1016
A100	Manual Bypass Alarm	4	0x1016
A101	Battery Near End of Life	5	0x1016
A102	Any Unit has UPS Maintenance Alarm	6	0x1016
A103	RESERVED	7	0x1016
A104	RESERVED	8	0x1016
A105	RESERVED	9	0x1016
A106	RESERVED	10	0x1016
A107	RESERVED	11	0x1016
A108	RESERVED	12	0x1016
A109	RESERVED	13	0x1016
A110	RESERVED	14	0x1016
A111	RESERVED	15	0x1016
A112	RESERVED	0	0x1017
A113	RESERVED	1	0x1017
A114	RESERVED	2	0x1017
A115	RESERVED	3	0x1017
A116	RESERVED	4	0x1017
A117	Parallel Error - Parameter Setting	5	0x1017
A118	Parallel Error - System ID Conflict	6	0x1017
A119	Parallel Error - Communication Error	7	0x1017
A120	RESERVED	8	0x1017
A121	RESERVED	9	0x1017
A122	Parallel Error - Redundancy Loss	10	0x1017
A123	Parallel Error - Sync. Ring Disconnected	11	0x1017
A124	RESERVED	12	0x1017
A125	RESERVED	13	0x1017
A126	Parallel Error - Sync. Signal Failed	14	0x1017
A127	Parallel Error - System Number Setting	15	0x1017

A128	RESERVED	0	0x1017
A129	Parallel Error - Sync. of Start or Load Transfer Error	1	0x1018
A130	RESERVED	2	0x1018
A131	RESERVED	3	0x1018
A132	EPO Activated	4	0x1018
A133	RESERVED	5	0x1018
A134	RESERVED	6	0x1018
A135	Comm. Board 1 Disconnected with Unit1	7	0x1018
A136	Comm. Board 2 Disconnected with Unit1	8	0x1018
A137	Comm. Board 3 Disconnected with Unit1	9	0x1018
A138	Comm. Board 4 Disconnected with Unit1	10	0x1018
A139	Comm. Board 5 Disconnected with Unit1	11	0x1018
A140	Comm. Board 6 Disconnected with Unit1	12	0x1018
A141	Comm. Board 1 CAN Error	13	0x1018
A142	Comm. Board 2 CAN Error	14	0x1018
A143	Comm. Board 3 CAN Error	15	0x1018
A144	Comm. Board 4 CAN Error	0	0x1019
A145	Comm. Board 5 CAN Error	1	0x1019
A146	Comm. Board 6 CAN Error	2	0x1019
A147	Comm. Board 1 General Alarm	3	0x1019
A148	Comm. Board 2 General Alarm	4	0x1019
A149	Comm. Board 3 General Alarm	5	0x1019
A150	Comm. Board 4 General Alarm	6	0x1019
A151	Comm. Board 5 General Alarm	7	0x1019
A152	Comm. Board 6 General Alarm	8	0x1019
A153	RESERVED	9	0x1019
A154	RESERVED	10	0x1019
A155	RESERVED	11	0x1019
A156	RESERVED	12	0x1019
A157	RESERVED	13	0x1019
A158	RESERVED	14	0x1019
A159	RESERVED	15	0x1019
A160~A239	RESERVED		
A240	RESERVED	0	0x101F
A241	RESERVED	1	0x101F
A242	RESERVED	2	0x101F

A243	RESERVED	3	0x101F
A244	RESERVED	4	0x101F
A245	RESERVED	5	0x101F
A246	RESERVED	6	0x101F
A247	RESERVED	7	0x101F
A248	RESERVED	8	0x101F
A249	RESERVED	9	0x101F
A250~A255	RESERVED	10	0x101F
A251	RESERVED	11	0x101F
A252	RESERVED	12	0x101F
A253	RESERVED	13	0x101F
A254	RESERVED	14	0x101F
A255	RESERVED	15	0x101F

Note. Status with “RESERVED” are not usable in KEOR COMPACT Series protocol.

(1) Optional function for Common Battery.

5.4 SYS Measurement data area

Information : Address from 0x1020, 121 WORDS

Code	Description	Unit	Address	Data Format
M00	Input voltage R ⁽¹⁾⁽³⁾	V*10	0x1020	###.#
M01	Input voltage S ⁽¹⁾⁽³⁾	V*10	0x1021	###.#
M02	Input voltage T ⁽¹⁾⁽³⁾	V*10	0x1022	###.#
M03	Input R-S Voltage ⁽¹⁾⁽³⁾	V*10	0x1023	###.#
M04	Input S-T Voltage ⁽¹⁾⁽³⁾	V*10	0x1024	###.#
M05	Input T-R Voltage ⁽¹⁾⁽³⁾	V*10	0x1025	###.#
M06	Input frequency	Hz*10	0x1026	##.#
M07	Input current R ⁽¹⁾⁽³⁾	A*10	0x1027	###.#
M08	Input current S ⁽¹⁾⁽³⁾	A*10	0x1028	###.#
M09	Input current T ⁽¹⁾⁽³⁾	A*10	0x1029	###.#
M10	Output voltage R ⁽²⁾	V*10	0x102A	###.#
M11	Output voltage S ⁽²⁾	V*10	0x102B	###.#
M12	Output voltage T ⁽²⁾	V*10	0x102C	###.#
M13	Output R-S Voltage ⁽²⁾	V*10	0x102D	###.#
M14	Output S-T Voltage ⁽²⁾	V*10	0x102E	###.#
M15	Output T-R Voltage ⁽²⁾	V*10	0x102F	###.#
M16	Output frequency	Hz*10	0x1030	##.#
M17	Output current R ⁽²⁾	A*10	0x1031	##.#

M18	Output current S ⁽²⁾	A*10	0x1032	##.#
M19	Output current T ⁽²⁾	A*10	0x1033	##.#
M20	Output active power phase R	kW*10	0x1034	##.#
M21	Output active power phase S	kW*10	0x1035	##.#
M22	Output active power phase T	kW*10	0x1036	##.#
M23	Output active power total	kW*10	0x1037	##.#
M24	Output apparent power phase R	kVA*10	0x1038	##.#
M25	Output apparent power phase S	kVA*10	0x1039	##.#
M26	Output apparent power phase T	kVA*10	0x103A	##.#
M27	Output apparent power total	kVA*10	0x103B	##.#
M28	Output power factor R	*100	0x103C	###
M29	Output power factor S	*100	0x103D	###
M30	Output power factor T	*100	0x103E	###
M31	Input Bypass voltage R ⁽¹⁾	V*10	0x103F	###.#
M32	Input Bypass voltage S ⁽¹⁾	V*10	0x1040	###.#
M33	Input Bypass voltage T ⁽¹⁾	V*10	0x1041	###.#
M34	Bypass R-S Voltage ⁽¹⁾	V*10	0x1042	###.#
M35	Bypass S-T Voltage ⁽¹⁾	V*10	0x1043	###.#
M36	Bypass T-R Voltage ⁽¹⁾	V*10	0x1044	###.#
M37	Input Bypass frequency	Hz*10	0x1045	##.#
M38	Load rate R	%	0x1046	###
M39	Load rate S	%	0x1047	###
M40	Load rate T	%	0x1048	###
M41	RESERVED			
M42	RESERVED			
M43	RESERVED			
M44	RESERVED			
M45	RESERVED			
M46	RESERVED			
M47	RESERVED			
M48	RESERVED			
M49	RESERVED			
M50	RESERVED			
M51	RESERVED			
M52	RESERVED			
M53	RESERVED			
M54	RESERVED			
M55	RESERVED			

M56	RESERVED			
M57	RESERVED			
M58	RESERVED			
M59	RESERVED			
M60	RESERVED			
M61	RESERVED			
M62	RESERVED			
M63	RESERVED			
M64	Battery remaining capacity ⁽⁴⁾	%*10	0x1060	##.#
M65	RESERVED			
M66	Remaining run time ⁽⁴⁾	min	0x1062	###
M67	Positive total battery voltage ⁽⁴⁾	V*100	0x1063	###.##
M68	Negative total battery voltage ⁽⁴⁾	V*100	0x1064	###.##
M69	Positive battery voltage per cell ⁽⁴⁾	V*100	0x1065	###
M70	Negative battery voltage per cell ⁽⁴⁾	V*100	0x1066	###
M71	Charging watt ⁽⁴⁾	kW*100	0x1067	###.##
M72	Discharging watt ⁽⁴⁾	kW*100	0x1068	###.##
M73	Positive battery charger current ⁽⁴⁾	A*100	0x1069	###.##
M74	Negative battery charger current ⁽⁴⁾	A*100	0x106A	###.##
M75	Positive battery discharger current ⁽⁴⁾	A*100	0x106B	###.##
M76	Negative battery discharger current ⁽⁴⁾	A*100	0x106C	###.##
M77	RESERVED			
M78	RESERVED			
M79	RESERVED			
M80	RESERVED			
M81	RESERVED			
M82	RESERVED			
M83	RESERVED			
M84	RESERVED			
M85	RESERVED			
M86	RESERVED			
M87	RESERVED			
M88	RESERVED			
M89	RESERVED			
M90	RESERVED			
M91	RESERVED			

M92	RESERVED			
M93	Input Bypass current R ⁽¹⁾	A*10	0x107D	###.#
M94	Input Bypass current S ⁽¹⁾	A*10	0x107E	###.#
M95	Input Bypass current T ⁽¹⁾	A*10	0x107F	###.#
M96	RESERVED			
M97	RESERVED			
M98	RESERVED			
M99	RESERVED			
M100	RESERVED			
M101	RESERVED			
M102	RESERVED			
M103~M119	RESERVED			
M120	Rectifier input active power	kW*10	0x1098	###.#

Note. Status with “RESERVED” are not usable in KEOR COMPACT Series protocol.

⁽¹⁾ This Information needs to be transferred if “Input transformer” is existing.

- Displayed Mains Voltage = (Input Voltage * Input transformer ratio).
- Displayed Mains Current = (Input current / Input transformer ratio).
- Displayed Bypass Voltage = (Input Bypass Voltage * Input transformer ratio).
- Displayed Bypass Current = (Input Bypass current / Input transformer ratio).

Note. “Input transformer ratio (T60)” settings please refers to chapter 5.6.

⁽²⁾ This Information needs to be transferred if “Output transformer” is existing.

- Displayed Output Voltage = (Output Voltage * Output transformer ratio).
- Displayed Output Current = (Output current / Output transformer ratio).

Note. “Output transformer ratio (T61)” settings please refers to chapter 5.6.

⁽³⁾ Optional function for Common input.

⁽⁴⁾ Optional function for Common Battery.

5.5 SYS Control area

Following code must be written into 0x10D0 vector index address. The commands are coded by a decimal value. Different value defined different command in word type.

Commands: Address: 0x10D0, 1word.

Code	Description	Remarks
C200	System Normal Mode	
C202	System ECO Mode	
C203	System Converter Mode	
C205	System Shutdown	Immediate load off!!
C206	System Load on Bypass	
C214	System Buzzer Disable	

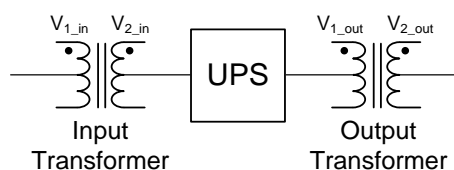
C215	System Buzzer Enable
C216	System Clear Latch Alarm and Buzzer

5.6 SYS Configurations area

Information : Address from 0x111C, 2 WORDS

Code	Description	Unit	Address	Remarks
T60	Input transformer ratio parameter	N*100	0x111C	0 : No Transformer. 0~1 : Transformer ratio ⁽¹⁾
T61	Output transformer ratio parameter	N*100	0x111D	0 : No Transformer. 0~1 : Transformer ratio ⁽¹⁾

⁽¹⁾ Transformer ratios can be calculated as following:



$$\text{Input transformer ratio} = V_{1_in}/V_{2_in} = T60$$

$$\text{Output transformer ratio} = V_{2_out}/V_{1_out} = T61$$

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┌ Installer stamp ─┐
└──────────────────┘

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