• 15G0851B100 •

DATA LOGGER

ES851

USER MANUAL

-Programming Instructions-

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English

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1. OVERVIEW

1.1. Main Features

ES851 Data Logger board allows logging weather variables and operating variables of a photovoltaic (industrial) plant and allows interfacing the PV plant to a supervisor computer, even a remote computer, through different connecting modes for data logging and monitoring of the devices connected to the PV plant.
Data is logged to 7 files (Log 1, Log 2, Log 3, Log 4, Log 5, Log 6, Event Log) and can be used to create a database that can be displayed and graphically represented through the RemoteDrive/Sunway software provided by Enertronica Santerno S.p.A. (see "How to Use this Manual" below).
ES851 Data Logger board can be handled through dedicated parameters that are divided into menus and submenus. Each menu includes programmable parameters, measures, and commands.
Data/information is exchanged through COM1 and COM2 serial ports provided with ES851, through the Ethernet socket for a LAN and the Internet.

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1.2. How to Use this Manual

This manual covers functionality and first startup of ES851 Data Logger board.
The RemoteDrive/Sunway software provided by Enertronica Santerno S.p.A. allows full exploitation of ES851 Data Logger functionality. The RemoteDrive/Sunway allows the following functions:

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- image acquisition;
- oscilloscope functions and multifunction tester functions;
- table compiler and displayer including operation data log;
- parameter setup and data reception-transmission-storage from and to a computer;
- scan function for the automatic detection of the connected devices (up to 247 devices may be connected).

You can also create your own dedicated software. This manual provides any information concerning addressing (Address field) and scaling (Range field) for interfacing with the Data Logger.

Some of the operations above can be performed via serial link, through standard RS485 port of the inverter where ES851 is installed, or using the display/keypad unit.
This manual covers the parameter settings as displayed by the RemoteDrive/Sunway; functions implemented in the display/keypad as well are highlighted accordingly. For more details about functionality of the display/keypad, please refer to the Programming Instructions manuals relating to the inverters provided with ES851 Data Logger board.

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2. FIRST STARTUP

This section outlines the basic setup of ES851 Data Logger board with reference to the parameterization detailed in the sections below. You can use the RemoteDrive/Sunway from a computer connected in local mode to ES851 via COM1 (which is factory set as RS232, Modbus slave).
The first startup of ES851 control board consists of two steps:

1. Connection configuration (see Connections below);
2. Configuration of the data acquisition function (see Setting the Routing Table and Programming the LOGGING Function).

2.1. Connections

ES851 Data Logger board can be connected to a computer in one of the following modes:

- Local mode: through COM1 and COM2 ports—RS232, RS485 or Ethernet port—for a direct LAN;
- Remote mode: through the Ethernet port.

The following sections explain how ES851 is started when using connecting modes other than the default modes, which are given in the table below.
Note that all parameters relating to ES851 connections are R parameters, which are read and acquired only after resetting ES851 Data Logger board.

NOTE Configurations other than the default connections can be required when ordering the equipment.

CONNECTION	DEFAULT CONFIGURATION
COM1	RS232 in Modbus Slave mode
COM2	RS485 in Modbus Master mode
Ethernet	Link Service with DHCP and DNS

Table 1: Default configurations of the available connections.

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2.1.1. CONNECTION TO THE LINK SERVICE

The connection via the Internet to the Link service is the default connecting mode. The connection to the Link service can be implemented using a router.

CAUTION

The connection to the Link service requires the DHCP in the network where ES851 Data Logger board is installed. If the DHCP is not available, disable the DHCP via parameter R450 in the TCP/IP PROXY CONFIGURATION MENU by selecting one of the options that do not require using this protocol (e.g. "5: PROXY Ethernet (No DHCP, DNS)", "6:PROXY Ethernet (No DHCP, No DNS)"), then enter the static IP address, the IP mask and the Gateway in the CONNECTION CONFIGURATION MENU.

2.1.2. LAN CONNECTION

The LAN connection is always active and can be accessed using the IP address of the Data Logger board.
Set parameter P270 to "1: Link Proxy OFF" to disable the Link service.

CAUTION

The LAN administrator must reserve a STATIC IP address so that it is uniquely identified, as a dynamic control of IP addresses can change the association between the MAC address of the Data Logger and the IP address whenever the equipment is started. As a result, the address required for communication cannot be known beforehand.

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2.2. ES851 Status Display

From the DATA LOGGER MENU, you can display the status of ES851, which is programmed with factory settings. In particular, the MAC address is displayed.
Make sure that no alarm trips. If so, try to reset the alarm; if the alarm persists, please contact Enertronica Santerno S.p.A..

2.3. Setting the Routing Table

The routing table defines the map where the identifier of each device connected to the Data Logger through a given transmitting device matches with the virtual identifier which the connected device responds to through the Data Logger itself. In that way, the networked devices can also connected to different apparatuses and can be controlled exactly in the same way via the Data Logger.
The Routing Table is preset for the automatic detection of the devices connected to RS485 serial link (COM2), if their identifiers have been previously set to values higher than or equal to 3. Unique identifiers are to be assigned to avoid conflicts. According to factory settings, COM2 port is already set as Master Modbus, thus allowing handling all the connected devices. Each address mapped in the table is enabled by default.
The ROUTING TABLE → ZONE MENU can be used for easier programming of ES851 controlling very complex plants.

2.4. Programming the LOGGING Function

The default LOGGING parameters have been studied by Enertronica Santerno's technicians in respect to the variables to be monitored (see APPENDIX). As a result, no modification is required for the DATA LOGGING CONSOLE MENU.
If the number of devices connected to ES851 is limited, an **extended (C161)** LOGGING can be performed, allowing monitoring more variables than factory-set variables.
Once the type of LOGGING is selected, ***activate the SCANNING*** of the connected devices through I160, allowing detecting the acronym and the routing address for all the devices connected to ES851. Measure M5049 displays the status of the LOGGING commands allowing checking if they are correct.
After sending the SCAN command, ES851 performs automatic settings of the parameters for the monitoring of the device variables (BOXING).
If no LOGGING is required for some of the detected devices, they can be excluded by setting the 'Type' field of parameters C300-C419. BOXING will be automatically performed by ES851 based on the new information.
You can now ***start LOGGING*** through I160. From the LOG MONITOR MENU and the EVENT MONITOR MENU, check if LOGGING is correct.
To view the logged data, follow the procedure explained in the UPLOAD CONSOLE MENU.

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NOTE LOGGING is to be activated as the last installation step. Any procedure for the connection configuration (see sections below) must be performed before LOGGING is activated.

NOTE The type of LOGGING (extended or standard logging) can be changed for any boxed device.

To sum up, do the following to activate the LOGGING function in the "DATA LOGGING CONSOLE MENU":

- Select the type of LOGGING from parameter C161;
- Press the SCAN button;
- Activate LOGGING , I160 "ENABLE All Logs".

2.5. Engineering Level for Logging

The ENGINEERING level allows the user to manually configure the LOGGING parameters included in the Log1, Log2… menus and the Event1, Event2… menu. To do so, disable the BOXING function from **P258**, or change the result of a BOXING operation, but make sure that the SCAN function is not performed again when LOGGING is enabled to avoid overwriting the log parameters. This can be useful when boxing is not performed automatically, as it is the case for some devices.
You can define the following data for each log: sampling time, number of data items, number of IDs, Modbus addresses for each datum to be sampled.
For each Evt Log, you can define the active events, the measure to be monitored as a trigger event, the trigger condition and the data items to be logged when the event fires.

2.6. Parameter Save

After entering the new settings, execute the Eeprom command "5: Save All" (see the "DATA LOGGER MENU") to keep them stored even after ES851 is reset. If you are using the RemoteDrive/Sunway software, just press the S key after changing a parameter, or send the Save All Command.

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3. MENU LIST

The menu list and the main features of each menu are contained in Table 2 below. Each menu is then detailed on the following pages.

MENU	FUNCTIONALITY
Data Logger	Main measures and functions of ES851
Data Logging Console	Console for the main logging functions
Scan Device 11-40	Console displaying the connected devices whose IDs range from 11 to 40
Upload Console	Console for the acquisition of stored data from ES851
Log 1 Monitor	Log 1 status
Log 2 Monitor	Log 2 status
Log 3 Monitor	Log 3 status
Log 4 Monitor	Log 4 status
Log 5 Monitor	Log 5 status
Log 6 Monitor	Log 6 status
Event Monitor	Event status
Modbus Configuration	Serial port configuration parameters
TCP/IP Proxy Configuration	Configuration parameters for TCP/IP communications with the Link server
Real Time Data	Configuration parameters for sending real-time data
SMS	SMS activation console
Clock/Calendar	Console for clock/calendar settings and display
Routing Table → ZONE	Zone configuration parameters
Routing Table 1-10	Table for the virtual mapping of the devices connected to the Data Logger for IDs 1-10
Routing Table 11-160	Table for the virtual mapping of the devices connected to the Data Logger for IDs next to 10
Log 1	Console for general configuration of Log 1
Log 1 D1	Parameters for the configuration of first datum of Log 1
Log 1 D2	Parameters for the configuration of second datum of Log 1
Log 1 D3-D8	Parameters for the configuration of data 3 to 8 of Log 1
Log 1 D9-D14	Parameters for the configuration of data 9 to 14 of Log 1
Log 1 D15-D20	Parameters for the configuration of data 15 to 20 of Log 1
Log 1 D20-D25	Parameters for the configuration of data 21 to 25 of Log 1
Other Log menus	Other Log menus for logs 2 to 6 equivalent to the Log 1 menus
Event1	Console for the configuration of event 1 in Evt Log
Event2 – Event40	39 menus equivalent to Event 1 for events 2 to 40
Download console	Console for uploading files to the Data Logger

Table 2: Menu List.

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3.1. Menus and Submenus

Three programming levels are available. They can be changed by setting P298 accordingly.
BASIC (factory setting): permits to view the main measures and to set parameters P298 (programming level) and allows changing basic programming;
ADVANCED: permits to access the BASIC parameters and the parameters relating to the programming of the available connections;
ENGINEERING: allows accessing all parameters.

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3.1.1. Synoptic Table for M Measures

(Read-only)

Mxxx	Range	Device representation (integer)	Display on the display/keypad and the RemoteDrive/Sunway software (may be a decimal figure) plus unit of measure
Measure Name	Level	Access Level (BASIC / ADVANCED)	
	Address	Modbus address which the measure can be read from (integer)	
	Function	Measure description.	

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3.1.2. Synoptic Table for P, R, I, C Parameters

(Read-Write)

Pxxx	Range	Device representation (integer)	Display on the display/keypad and the RemoteDrive/Sunway software (may be a decimal figure) plus unit of measure
Parameter Name	Default	Parameter factory-setting (as represented for ES851 board)	Parameter factory-setting (as displayed) plus unit of measure
	Level	Access Level (BASIC / ADVANCED/ ENGINEERING)	
	Address	ModBus address which the parameter can be read from/written to (integer)	
	Function	Parameter description	

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Pxxx Parameters (Always R/W).

Cxxx Parameters (Read-only with LOGGING function activated; R/W with LOGGING function deactivated).

NOTE

Rxxx Parameters Always R/W, but they activate only when the device is next powered on.

Ixxx Inputs These are not parameters, but inputs (the values assigned to these inputs are not stored to non-volatile memory. They are always set to 0 when the inverter is powered on).

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3.2. List of the BASIC Measures and Parameters

Menu	Parameter	FUNCTION	MODBUS Address	Default
4 DATA LOGGER MENU	P298	Access Level	298	BASIC
	I012	EEPROM Command	2003	No Command
	M475	Software Version	475	-
	M5000	Alarm Condition	5000	-
	M5003	Active Access Level	5003	-
	M5004	Flash Card Error	5004	-
	M5006	MAC Address	5006, 5007, 5008	-
	M5199	Latest EEPROM command not executed	5199	-
8 LOG 1 MONITOR MENU	M5050	Log 1 Length	5050	-
	M5057	Log 1 Status	5057	-
	M5070a-b	Year and Month of Activation of Log 1	5070	-
	M5071a-b	Day and Time of Activation of Log 1	5071	-
	M5072a-b	Minutes and Seconds of Activation of Log 1	5072	-
8 LOG 2 MONITOR MENU	M5051	Log 2 Length	5051	-
	M5058	Log 2 Status	5058	-
	M5073a-b	Year and Month of Activation of Log 2	5073	-
	M5074a-b	Day and Time of Activation of Log 2	5074	-
	M5075a-b	Minutes and Seconds of Activation of Log 2	5075	-
8 LOG 3 MONITOR MENU	M5052	Log 3 Length	5052	-
	M5059	Log 3 Status	5059	-
	M5076a-b	Year and Month of Activation of Log 3	5076	-
	M5077a-b	Day and Time of Activation of Log 3	5077	-
	M5078a-b	Minutes and Seconds of Activation of Log 3	5078	-
8 LOG 4 MONITOR MENU	M5053	Log 4 Length	5053	-
	M5060	Log 4 Status	5060	-
	M5079a-b	Year and Month of Activation of Log 4	5079	-
	M5080a-b	Day and Time of Activation of Log 4	5080	-
	M5081a-b	Minutes and Seconds of Activation of Log 4	5081	-
8 LOG 5 MONITOR MENU	M5054	Log 5 Length	5054	-
	M5061	Log 5 Status	5061	-
	M5082a-b	Year and Month of Activation of Log 5	5082	-
	M5083a-b	Day and Time of Activation of Log 5	5083	-
	M5084a-b	Minutes and Seconds of Activation of Log 5	5084	-

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Menu	Parameter	FUNCTION	MODBUS Address	Default
8 LOG 6 MONITOR MENU	M5055	Log 6 Length	5055	-
	M5062	Log 6 Status	5062	-
	M5085a-b	Year and Month of Activation of Log 6	5085	-
	M5086a-b	Day and Time of Activation of Log 6	5086	-
	M5087a-b	Minutes and Seconds of Activation of Log 6	5087	-
9 EVENT MONITOR MENU	M5056	Evt Log Length	5056	-
	M5063	Evt Log Status	5063	-
	M5088a-b	Year and Month of Activation of Evt Log	5088	-
	M5089a-b	Day and Time of Activation of Evt Log	5089	-
	M5090a-b	Minutes and Seconds of Activation of Evt Log	5090	-
15 CLOCK/CALENDAR MENU	M5010a	Year	5010	-
	M5010b	Month	5010	-
	M5011a	Day of the Week	5011	Mon
	M5011b	Day of the Month	5011	1
	M5012a	Hours	5012	-
	M5012b	Minutes	5012	-
	M5013	Seconds	5013	-

Table 3: List of the BASIC measures and parameters.

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3.3. List of the ADVANCED Measures and Parameters

Menu	Parameter	FUNCTION	MODBUS Address	Default Setting
5 DATA LOGGING CONSOLE MENU	M164	Min. Sampling Time	164	-
	P229	Initial SCANNING Address	229	1
	P230	Final SCANNING Address	230	40
	C238	Fast Sampling Only	238	No
	C161	Type of Data Logging	161	Standard
	C162	Fast Log Sampling Time	162	60 s (1 min)
	C163	Fast Log Sample N.	163	1
	C245	Fast Log Min. Variation Percent	245	0,0%
	C242	Slow Log Sampling Time	242	3600s (1 hour)
	C243	Slow Log Sample N.	243	1
	C244	Slow Log Min. Variation Percent	244	0.0%
	I160	Logger Command	160	No command
	M5049	LOGGING Command Status	5049	-
	M5016	N. of Devices Detected when SCANNING	5016	-
	M5017	Modbus ID of the Device being SCANNED	5017	-
	C300, ... C327 (one every three)	ID of the Connected Device	300, 303, ..., 327 (one every three)	0
	C301, ... C328 (one every three)	Type of Connected Device	301, 304, ..., 328 (one every three)	No device detected
	M214	Connected Device Boxing	214	-
	M215	Recognized Connected Device	215	-
	C241	Extended Logging for the Connected Device	241	Standard logging for each device
	M512	Event 0 Fired for the Connected Device	512	-
6 SCAN DEVICE 11-40 MENU	C330, ... C417 (one every three)	Connected Device ID	330, 333, ..., 417 (one every three)	0
	C330, ... C418 (one every three)	Type of Connected Device	331, 334, ..., 418 (one every three)	No device detected
	M204, M205	Boxing of the Connected Device	204, 205	-
	M207, M208	Connected Device Recognized	207, 208	-
	C239, C240	Extended Logging for the Connected Device	239, 240	Long standard for each device
	M510, M511	Event 0 Active for the Connected Device	510, 511	-
10 MODBUS CONFIGURATION MENU	R297	ES851 Device Id	297	1

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Menu	Parameter	FUNCTION	MODBUS Address	Default Setting
11 CONNECTION CONFIGURATION MENU	R450	Type of Remote Connection	450	PROXY Ethernet (DCHP, DNS)
	R270	Type of Proxy Connection	270	Link Proxy ON
	R276 ÷ R277	IP Address	276, 277	192.168.0.2
	R278 ÷ R279	Network Mask	278, 279	255.255.255.0
	R247 ÷ R248	Gateway	247, 248	0.0.0.0
	M5037	RemoteDrive/Sunway Connection Status	5037	-
13 REAL TIME DATA MENU	P578	Time Period for Sending Real-time Data	578	1441 (Data Send Disabled)
14 SMS MENU	M5066	SMS Status	5066	-
	P3150 ÷ P3177	Message Heading	3150 ÷ 3177	-
	P294	SMS Sent after Event Resolved	294	Yes
15 CLOCK/CALENDAR MENU	P2010a	Year To Be Changed	2010	2000
	P2010b	Month To Be Changed	2010	January
	P2011a	Day Of The Week To Be Changed	2011	Mon
	P2011b	Day Of The Month To Be Changed	2011	1
	P2012a	Time (Hour) To Be Changed	2012	0
	P2012b	Time (Minutes) To Be Changed	2012	0
	I2013b	Clock/Calendar Editing Command	2013	0
	R3200	Time Lag (Hours) of the Local Time Zone	3200	1
	R3201	Time Lag (Minutes) of the Local Time Zone	3201	0
16 ROUTING TABLE → ZONE	P200	ZONE Start ID	200	23
	P201	ZONE End ID	201	44
	I200	Enable Zone Command	160	-
	M5049	Enable Zone Status	5049	-
17 ROUTING TABLE 1-10 MENU	P00a ÷ P009a	Medium for Virtual Address 1-10	0-9	1: ES851 Local 2: ES821 DPR 3 ÷ 9: RS485 Modbus
	P00b ÷ P009b	Device ID for Virtual Address 1-10	0-9	1 ÷ 10
	P00c ÷ P009c	Virtual Address 1-10 Enable	0-9	1

Table 4: List of the ADVANCED measures and parameters.

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3.1. List of the ENGINEERING Measures and Parameters

NOTE

Only Log 1 parameters are specified below, since equivalent parameters apply to the other logs. The same is valid for the Event1 menu, since the parameters of the other event-type menus are the same.

Menu	Parameter	FUNCTION	MODBUS Address	Default
4 DATA LOGGER MENU	P259	Timeout at the end of the early warning	259	60 s
	M5038	Early warning counter	5038	-
	M5039	Early warning status	5039	-
	P257	Ignore early warning	257	For all logs
	M5197	Flash recovery status	5197	-
	P296	BLH idle timeout	296	600 s
	P618	Timeout log in stop	618	120 s
5 DATA LOGGING CONSOLE	P258	Boxing enabled	258	Yes
9 EVENT MONITOR	M5200a	ID of the first device that generated the 0 event	5200	-
10 MODBUS CONFIGURATION	R218	COM1 type	218	RS232
	R260	COM1 configuration	260	Slave
	R261	COM1 baudrate	261	38400
	R262	COM1 parity	262	2 stop bit, mark
	R263	COM1 lag time between packets	263	20 ms
	R264	COM1 timeout	264	500 ms
	R265	COM2 configuration	265	Master
	R266	COM2 baudrate	266	38400
	R267	COM2 parity	267	2 stop bit, mark
	R268	COM2 lag time between packets	268	20 ms
	R269	COM2 timeout	269	500 ms
	R213	COM2 RTS signal polarity	213	Low signal enable
11 CONNECTION CONFIGURATION MENU	R271	TCP/IP Port	271	6767
12 TCP/IP PROXY CONFIGURATION	M246	DHCP enable	246	-
	M5165 ÷ M5166	IP address (from DHCP)	5165 ÷ 5166	-
	M5092 ÷ M5093	Gateway IP address (from DHCP)	5092 ÷ 5093	-
	M5176	DHCP lease	5176	-
	M5177	DHCP renew	5177	-
	M596	DNS enable	596	-
	R220 ÷ R221	Main DNS	220 ÷ 221	208.67.222.222

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Menu	Parameter	FUNCTION	MODBUS Address	Default
	R222 ÷ R223	Secondary DNS	222 ÷ 223	208.67.220.220
	R597 ÷ R598	Proxy static IP	597 ÷ 598	213.174.178.156
	M560 ÷ M561	IP address solved and stored	560 ÷ 561	-
	R295	Keepalive message timeout	295	5 min
	R599	Proxy TCP/IP port	599	15100
	M5190	NCI machine status	5190	-
	M5191	NCI machine sub-status	5191	-
	M5192	Proxy connection status	5192	-
	M5193	Tunnel error	5193	-
	M5194	Tunnel via Proxy to RD	5194	-
	R3280 ÷ R3309	Proxy URL	3280 ÷ 3309	link.elettronicasanterno.it
18 ROUTING TABLE 11-160 MENU	P10a ÷ P159a	Virtual address medium 11-160	10-159	RS485 Modbus
	P10b ÷ P159b	Virtual address device ID 1-10	10-159	11 ÷ 160
	P10c ÷ P159c	Virtual address enable 1-10	10-159	0
19 LOG 1 MENU	C700	Storing enable	700	Disabled
	C701	Sampling time	701	3600 s
	C702	No. of samples for storing	702	1
	C703	% of variation for storing	703	0
	C704	No. of data per record	704	5
20 LOG 1 D1 MENU	C705	L1D1 Multiplier coefficient K	705	1
	C706	L1D1 Composition function	706	K*(a*Ka* + b*Kb* + c*Kc)
	C707	L1D1 Statistical function	707	Sampling average
	C708	L1D1-A Multiplier coefficient Ka	708	1
	C709a	L1D1-A Type of datum	709	Integer, no sign
	C709b	L1D1-A Word no.	709	Word 16 bit
	C709c	L1D1-A Device ID	709	0
	C710	L1D1-A Modbus address	710	0
	C711	L1D1-B Multiplier coefficient Kb	711	1
	C712a	L1D1-B Type of datum	712	Integer, no sign
	C712b	L1D1-B Word no.	712	Word 16 bit
	C712c	L1D1-B Device ID	712	0
	C713	L1D1-B Modbus address	713	0
	C714	L1D1-C Multiplier coefficient Kc	714	1
	C715a	L1D1-C Type of datum	715	Integer, no sign
	C715b	L1D1-C Word no.	715	Word 16 bit
	C715c	L1D1-C Device ID	715	0
	C716	L1D1-C Modbus address	716	0
	C798a	L1D1 % variation disabled	798	No
21 LOG 1 D2 MENU	C717	L1D2 Multiplier coefficient K	717	1
	C718	L1D2 Composition function	718	K*(a*Ka* + b*Kb* + c*Kc)
	C719	L1D2 Statistical function	719	Sampling average
	C720	L1D2-A Multiplier coefficient Ka	720	1
	C721a	L1D2-A Type of datum	721	Integer, no sign
	C721b	L1D2-A Word no.	721	Word 16 bit
	C721c	L1D2-A Device ID	721	0
	C722	L1D2-A Modbus address	722	0
	C723	L1D2-B Multiplier coefficient Kb	723	1
	C724a	L1D2-B Type of datum	724	Integer, no sign
	C724b	L1D2-B Word no.	724	Word 16 bit
	C724c	L1D2-B Device ID	724	0
	C725	L1D2-B Modbus address	725	0
	C726	L1D2-C Multiplier coefficient Kc	726	1

Menu	Parameter	FUNCTION	MODBUS Address	Default
	C727a	L1D2-C Type of datum	727	Integer, no sign
	C727b	L1D2-C Word no.	727	Word 16 bit
	C727c	L1D2-C Device ID	727	0
	C728	L1D2-C Modbus address	728	0
	C798b	L1D2 % variation disabled	798	No
22 LOG 1 D3-D8 MENU	C729, C732, C735, C738, C741, C744	L1D3 Statistical function	729, 732, 735, 738, 741, 744	Sampling average
	C730a, C733a, C736a, C739a, C742a, C745a	L1D3 Type of datum	730, 733, 736, 739, 742, 745	Integer, no sign
	C730b, C733b, C736b, C739b, C742b, C745b	L1D3 Word no.	730, 733, 736, 739, 742, 745	Word 16 bit
	C730c, C733c, C736c, C739c, C742c, C745c	L1D3 Device ID	730, 733, 736, 739, 742, 745	0
	C731, C734, C737, C740, C743, C746	L1D3 Modbus address	731, 734, 737, 740, 743, 746	0
	C798c, C798d, C798e, C798f, C798g, C798h	L1D3 % variation disabled	798	No
23 LOG 1 D9-D14 MENU	C747, C750, C753, C756, C759, C762	L1D9 Statistical function	747, 750, 753, 756, 759, 762	Sampling average
	C748a, C751a, C754a, C757a, C760a, C763a	L1D9 Type of datum	748a, 751a, 754a, 757a, 760a, 763a	Integer, no sign
	C748b, C751b, C754b, C757b, C760b, C763b	L1D9 Word no.	748b, 751b, 754b, 757b, 760b, 763b	Word 16 bit
	C748c, C751c, C754c, C757c, C760c, C763c	L1D9 Device ID	748c, 751c, 754c, 757c, 760c, 763c	0
	C749, C752, C755, C758, C761, C764	L1D9 Modbus address	749, 752, 755, 758, 761, 764	0
	C798i, C798l, C798m, C798m, C798o, C798p	L1D9 % variation disabled	798	No
24 LOG 1 D15-D20 MENU	C765, C768, C771, C774, C777, C780	L1D15 Statistical function	765, 768, 771, 774, 777, 780	Sampling average
	C766a, C769a, C772a, C775a, C778a, C781a	L1D15 Type of datum	766a, 769a, 772a, 775a, 778a, 781a	Integer, no sign
	C766b, C769b, C772b, C775b, C778b, C781b	L1D15 Word no.	766b, 769b, 772b, 775b, 778b, 781b	Word 16 bit
	C766c, C769c, C772c, C775c, C778c, C781c	L1D15 Device ID	766c, 769c, 772c, 775c, 778c, 781c	0
	C767, C770, C773, C776, C779, C782	L1D15 Modbus address	767, 770, 773, 776, 779, 782	0
	C798q, C798r,	L1D15 % variation disabled	798, 799	No

Menu	Parameter	FUNCTION	MODBUS Address	Default
	C799a, C799b, C799c, C799d			
25 LOG 1 D21-D25 MENU	C783, C786, C789, C792, C795	L1D21 Statistical function	783, 786, 789, 792, 795	Sampling average
	C784a, C787a, C790a, C793a, C796a	L1D21 Type of datum	784a, 787a, 790a, 793a, 796a	Integer, no sign
	C784b, C787b, C790b, C793b, C796b	L1D21 Word no.	784b, 787b, 790b, 793b, 796b	Word 16 bit
	C784c, C787c, C790c, C793c, C796c	L1D21 device ID	784c, 787c, 790c, 793c, 796c	0
	C785, C788, C791, C794, C797	L1D21 Modbus address	785, 788, 791, 794, 797	0
	C799e, C799f, C799g, C799h, C798i	L1D21 % variation disabled	799	No
27 EVENT1 MENU	C520a	E1 Enable	520	No
	C1420	E1 Threshold function	1420	Less than
	C1421a	E1 Datum type trigger	1421	Integer, no sign
	C1421c	E1 Device ID trigger	1421	0
	C1422	E1 Modbus address trigger	1422	0
	C1423	E1 Threshold value	1423	0
	C1424	E1 Offset from threshold	1424	0
	C1425a	E1D1 Type of datum	1425	Integer, no sign
	C1425b	E1D1 Word no.	1425	Word 16 bit
	C1425c	E1D1 Device ID	1425	0
	C1426	E1D1 Modbus address	1426	0
	C1427a	E1D2 Type of datum	1427	Integer, no sign
	C1427b	E1D2 Word no.	1427	Word 16 bit
	C1427c	E1D2 Device ID	1427	0
	C1428	E1D2 Modbus address	1428	0

Table 5: List of ENGINEERING measures and parameters

4. DATA LOGGER MENU

The Data Logger menu contains all data relating to ES851 and its basic settings. The first parameter being displayed is the MAC Address, which uniquely identifies ES851 Data Logger board.
The Data Logger menu allows changing the programming level (P298) and displaying the software version (M475) implemented in ES851. It also allows restoring default values and storing and deleting data acquired by ES851 through the EEPROM (I012) command. ES851 Data Logger board is provided with two Flash cards for data storage. Parameters are contained in the DATA FLASH; the Restore Default or Save All commands affect this portion of memory. The Restore Default command also restores the parameters relating to ES851 for the inverter where the Data Logger is installed. On the other hand, data stored when LOGGING are stored to 8-Mb FLASH CARD of ES851. As a result, any log operation (e.g. Erase Log) affects ES851 Flash Card.
M5199 indicates the latest EEPROM command that has not been executed, as well as the alarm tripped and its fault code.

Parameter	FUNCTION	Access Level	MODBUS Address
P298	Access Level	BASIC	**298**
I012	EEPROM Command	BASIC	**2003**
M475	Software Version	BASIC	**475**
M5000	Alarm Condition	BASIC	**5000**
M5003	Active Access Level	BASIC	**5003**
M5004	Flash Card Error	BASIC	**5004**
M5006	MAC Address	BASIC	**5006, 5007, 5008**
M5199	Latest EEPROM command not executed	BASIC	**5199**
P259	Early warning Timeout	ENGINEERING	**259**
M5038	Early Warning Counter	ENGINEERING	**5038**
M5039	Early Warning	ENGINEERING	**5039**
P257	Ignore Early Warning	ENGINEERING	**257**
M5197	Flash Recovery Status	ENGINEERING	**5197**
P296	BLH Idle Timeout	ENGINEERING	**296**
P618	Timeout Log in Stop	ENGINEERING	**618**

Table 6: List of the parameters and measures in the Data Logger menu.

P298 Access Level

P298	**Range**	0 ÷ 2	0: Basic 1: Advanced 2: Engineering
Access Level	**Default**	0	Basic
	Level	BASIC	
	Address	298	
	Function	The programming parameters for ES851 are grouped by access levels based on their functions (more or less complex functions). Some menus, or some parts of menus, are not displayed when a given access level is selected. When the BASIC access level is selected if the ES851 parameterization is correct, navigation is easier, as only frequently accessed parameters are displayed. In this manual, the Access Level is stated for each parameter.	

I012 EEPROM Command

I012	**Range**	0, 5, 11, 30 ÷ 36, 777	0: No Command 5: Save all 11: Restore Default 30: Erase Log 1 31: Erase Log 2 32: Erase Log 3 33: Erase Log 4 34: Erase Log 5 35: Erase Log 6 35: Erase Event Log 37: Erase All Logs 777: Erase Fault List
EEPROM Command	**Default**	This is not a parameter: I012 is set to zero at power on and whenever the EEPROM command is executed.	
	Level	BASIC	
	Address	2003	
	Function	This parameter saves and restores the entire set of parameters that can be accessed by the user: **5: Save All**, The current value of the RAM parameters is stored to non-volatile memory (DATA FLASH). All parameters are saved at a time. **11: Restore Default**, Factory-set values are restored for all parameters; each factory-set value is stored to non-volatile memory (DATA FLASH). **30 to 35: Erase Log1,2,3,4,5,6,Event Log**, Erases any data in the specified log (data is stored to **FLASH CARD**). **36: Erase All Logs**, Erases data acquired in all logs (data is stored to **FLASH CARD**). **777: Erase Fault List**, Erases the fault list stored to **DATA FLASH** memory.	

M475 Software Version

M475	**Range**	1000÷9999	1000 ÷9999
Software Version	**Level**	BASIC	
	Address	475	
	Function	This measure indicates the software version implemented in ES851.	

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Tabella formattata

M5000 Alarm Condition

M5000	Range	0 ÷ 6, 99 ÷ 103	0: No Alarm 1: Par Save KO 2: Log Write Failure 3: ES821 Init. Failure 4: RS232 Init. Failure 5: RS485 Init.Failure 6: TCP/IP Stack Init. Failure 99: No Flash Card 100: Invalid Stream 101: TCP/IP Socket 103: ES821 Clock 104: Modem Init. 105: Modem KO
Alarm Condition	Default	0	0: No Alarm
	Level	BASIC	
	Address	5000	
	Function	This measure indicates the current alarm tripped for ES851. Please contact Enertronica Santerno S.p.A. and state the alarm number and name. 0: No Alarm 1: Parameter Save Error 2: Log Write Error 3: FBS Configuration Error 4: Modbus RS232 Configuration Error 5: Modbus RS485 Configuration Error 6: TCP/IP Stack Configuration Error 99: Flash Card Missing or Inaccessible 100: Invalid Access to Stream 101: TCP/IP Socket Error 103: Clock 821 Error 104: Modem Initialization Error 105: Modem Off or Not Connected	

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M5003 Active Access Level

M5003	Range	0 ÷ 2	0: Basic 1: Advanced 2: Engineering
Active Access Level	Level	BASIC	
	Address	5003	
	Function	This measure indicates the access level that is currently selected.	

M5004 Flash Card Error

M5004	**Range**	0 ÷ 7	0: No Error 1: Stream Full 2: Checksum Error 3: Invalid Descriptor 4: Invalid Stream 5: Chain Error 6: Invalid Partitioning 7: Stream Busy
Flash Card Error	**Level**	BASIC	
	Address	5004	
	Function	The errors above concern the flash card (the memory zone where logs are stored) and its relevant operations. If an alarm trips, please contact Enertronica Santerno S.p.A. and mention the alarm number and name.	

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M5006 MAC Address

M5006	**Range**	$0 \div 2^{48}$	$0 \div 2^{48}$
MAC Address	**Level**	BASIC	
	Address	5006, 5007, 5008	
	Function	The MAC Address is the physical address for ES851 network interface. A unique MAC Address is assigned to each ES851 board.	

M5199 Latest EEPROM Command Not Executed

M5199	**Range**	0, 32773, 32779, 32798 ÷ 32805, 33545	0: No Command 5: Save all 11: Restore Default 30: Erase Log 1 31: Erase Log 2 32: Erase Log 3 33: Erase Log 4 34: Erase Log 5 35: Erase Log 6 36: Erase Event Log 37: Erase All Logs 777: Erase Fault List
Latest EEPROM Command Not Executed	**Level**	BASIC	
	Address	5199	
	Function	This measure indicates the latest EEPROM command that has not been correctly executed. Codification is the same as for I012, but the most significant bit is set to one, thus changing the range of values that can be assigned to this measure.	

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P259 Early Warning Timeout

P259	Range	1 ÷ 3600	1 s ÷ 3600 s
Early Warning Timeout	Default	60	60 s
	Level	ENGINEERING	
	Address	259	
	Function	Indicates the timeout (in seconds) elapsing after the early warning signal sent from the inverter.	

M5038 Early Warning Counter

M5038	Range	0 ÷ Max (Max = value in P259)	0 s÷ Max s
	Level	ENGINEERING	
	Address	5038	
	Function	The early warning counter is set to the value in P259 when the early warning finish signal is sent. The early warning counter is decremented every second. The counter stops as soon as the early warning signal is reactivated.	

M5039 Early Warning Status

M5039	Range	0 ÷ 1	0: Inactive 1: Active
Early Warning Status	Level	ENGINEERING	
	Address	5039	
	Function	If it is worth 1, this means that the early warning signal is active or the early warning signal is other than 0.	

P257 Ignore Early Warning

P257	Range	0 ÷ 2	0: Never 1: For the Event log only 2: For any log
Ignore Early Warning	Default	2	For any log
	Level	ENGINEERING	
	Address	257	
	Function	It indicates when the early warning status (M5039=1) has to be ignored. 0: Never. When the early warning status is active no log is recorded. 1: Events log only. When the early warning status is active only the events log is recorded. 2: All logs. When the early warning status is active, this status is ignored and all the logs can be recorded.	

NOTA

The early warning signal is notified by the inverter to the Data Logger via the dual port RAM. This signal is active when the inverter detects voltage values that presume the board will switch off in a few seconds.

M5197 Flash Recovery Status

M5197	Range	0 ÷ 1	0: Recovery not in progress 1: Recovery in progress
Flash Recovery Status	Level	ENGINEERING	
	Address	5197	
	Function	This measure indicates whether the Data Logger is carrying out the initial checks on the consistency status of the Data Flash.	

P296 BLH Idle Timeout

P296	Range	0 ÷ 65535	0 s ÷ 65535 s
BLH Idle Timeout	Default	600	600 s
	Level	ENGINEERING	
	Address	296	
	Function	It indicates after how many seconds of idling the Data Logger should deactivate the upload and download status.	

P618 Timeout Log in stop

P618	Range	10 ÷ 3600	10 s ÷ 3600 s
Timeout Log in Stop	Default	120	120 s
	Level	ENGINEERING	
	Address	618	
	Function	It indicates after how many seconds a log in stop status (with no upload in progress) should return to the running status.	

5. DATA LOGGING CONSOLE MENU

This is the main operating menu. The parameters contained in this menu permit to SCAN the devices controlled by the Data Logger, to automatically program the parameters relating to the variables monitored by the device LOGGING (this function is called BOXING) and to activate/deactivate/delete the files containing LOGGING-monitored data.
The parameters specific to the variables monitored by the LOGGING (BOXING) function are automatically programmed after SCANNING (I160) and after programming certain parameters that can be modified by the user. Parameters specific to the monitored variables can be accessed only if the Engineering access level is selected. Variables that can be monitored are automatically divided into 6 groups, which are called Log1, 2, 3, 4, 5, 6.
Automatic LOGGING can be either ***standard*** or ***extended logging*** (C161). When extended logging is activated, more variables are monitored if compared to the standard logging.
According to factory setting (***standard*** LOGGING for each device), each ES851 board can perform the LOGGING function for each device connected to the plant, up to max. 40 devices. The type of LOGGING can be selected for each connected device, for the optimization of the number of devices that can be boxed.
In both cases, the acquired variables are detected within a parameter set contained in a table which is unique to each device and which is stored to ES851 when factory setting is performed (see APPENDIX).
Two log groups are available: Fast Log (C162, C163, C245) and Slow Log (C242, C243, C244), which are characterized by a different factory-set sampling time of the logged variables. The parameters above allow the user to change the sample number and the minimum variation percent of a data item for its logging.
ES851 Data Logger is also capable of logging data relating to each connected inverter when one of its variables changes. Besides recording the alarms of the connected devices, ES851records to the Event file the non-response from one of the connected devices (a non-response event is an Event 0). The parameters specific to the Event Log are inaccessible at a Basic level and are automatically BOXED along with the parameters of the other logs. Their values are stated in the tables stored during the factory setting stage (see APPENDIX).
After SCANNING, you can manually deselect some of the detected devices.
This menu views the first 10 devices that are detected from ES851 Data Logger. The setting of the next 30 devices, if detected, can be viewed and changed in the SCAN DEVICE 11-40 MENU.
After each operation on the parameters above, ES851 performs automatic BOXING based on the new stored values.
The Data Logging Console menu also includes a set of measures indicating the command status and the programming status of ES851.

NOTE

The factory-settings of the parameters included in the Data Logging Console menu do not require any customization. You can just use the SCAN command and the Log Enable command through parameter I160.

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Parameter	FUNCTION	Access Level	MODBUS Address
M164	Min. Sampling Time	ADVANCED	164
P229	Initial SCANNING Address	ADVANCED	229
P230	Final SCANNING Address	ADVANCED	230
C238	Fast Sampling Only	ADVANCED	238
C161	Type of Data Logging	ADVANCED	161
C162	Fast Log Sampling Time	ADVANCED	162
C163	Fast Log Sample N.	ADVANCED	163
C245	Fast Log Min. Variation Percent	ADVANCED	245
C242	Slow Log Sampling Time	ADVANCED	242
C243	Slow Log Sample N.	ADVANCED	243
C244	Slow Log Min. Variation Percent	ADVANCED	244
I160	Logger Command	ADVANCED	160
M5049	LOGGING Command Status	ADVANCED	5049
M5016	N. of Devices Detected when SCANNING	ADVANCED	5016
M5017	Address of the Device being SCANNED	ADVANCED	5017
C300 ÷ C327	ID of the Connected Device	ADVANCED	300, 303, ... 327 (one every three)
C301 ÷ C328	Type of Connected Device	ADVANCED	301, 304, ... 328 (one every three)
M214	Connected Device Boxing	ADVANCED	214
M215	Recognized Connected Device	ADVANCED	215
C241	Extended Logging for the Connected Device	ADVANCED	241
M512	Event 0 Fired for the Connected Device	ADVANCED	512
P258	Boxing enabled	ENGINEERING	258

Table 7: List of the parameters and measures in the Data Logging Console menu.

M164 Min. Sampling Time

M164			
Min. Sampling Time	Range	1 ÷ 65535	1 ÷ 65535 sec
	Level	ADVANCED	
	Address	164	
	Function	Min. sampling time which is automatically detected by the LOGGING system. This is updated whenever a scanning function is performed. The sampling time (C162 and C242) cannot be set up to a value lower than the one set in M164.	

P229 Initial SCANNING Address

P229			
Initial SCAN Address	Range	0 ÷ 160	0 ÷ 160
	Default	23	
	Level	ADVANCED	
	Address	229	
	Function	The initial address for ES851 SCAN is defined in this parameter.	

P230 Final SCANNING Address

P230			
Final SCANNING Address	Range	0 ÷ 160	0 ÷ 160
	Default	40	
	Level	ADVANCED	
	Address	230	
	Function	This parameter sets the max. allowable address for ES851 SCANNING.	

C238 Fast Sampling Only

C238			
FAST Sampling Only	Range	0 ÷ 1	0: No 1: Yes
	Default	0	0: No
	Level	ADVANCED	
	Address	238	
	Function	If this parameter is set to 1, all the variables to be monitored will be sampled in "fast" mode by ES851; this means that even the slow logs will be acquired as "fast".	

C161 Type of Data Logging

C161			
Type of Data Logging	Range	0-1	0: Standard Data Logging 1: Extended Data Logging
	Default	0	0: Standard
	Level	ADVANCED	
	Address	161	
	Function	This parameter sets the amount of data items to be stored for each device detected in the logging network. If the Extended Data Logging is selected, a greater number of variables is acquired for the selected device; as a result, the number of devices to LOG is reduced.	

C162 Fast Log Sampling Time

C162			
Fast Log Sampling Time	Range	1 ÷ 65535	1 ÷ 65535 s
	Default	60	60 s (1 min)
	Level	ADVANCED	
	Address	162	
	Function	This parameter sets the sampling time of data stored to fast logs. Note: The sampling time cannot be set to lower values than the value set in M164. This value is automatically computed each time scanning takes place and depends on the number of detected devices and the number of data items to store.	

C163 Fast Log Sample N.

C163			
Fast Log Sample N.	Range	1 ÷ 50	1 ÷ 50
	Default	1	1
	Level	ADVANCED	
	Address	163	
	Function	Number of samples to acquire for the statistic computation of the data to be stored. If this parameter is set to 1, no statistic operation takes place and the sample is just stored as data.	

C245 Fast Log Min. Variation Percent

C245			
Fast Log Min. Variation Percent	Range	0 ÷ 65535	0.0 ÷ 6553.5 %
	Default	0	0.0 %
	Level	ADVANCED	
	Address	245	
	Function	Variance for the data storage to the FLASH CARD. When C245 is other than 0, logging occurs if at least one of the variables to be acquired varies from the last logging of a value percent (considered as raw data) which is higher than C245.	

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C242 Slow Log Sampling Time

C242			
Slow Log Sampling Time	Range	1 ÷ 65535	1 ÷ 65535 s
	Default	3600	3600 s (1 h)
	Level	ADVANCED	
	Address	242	
	Function	This parameter sets the sampling time of data stored to slow logs. Note: The sampling time cannot be set to lower values than the value set in M164. This value is automatically computed each time scanning takes place and depends on the number of detected devices and the number of data items to store.	

C243 Slow Log Sample N.

C243			
Slow Log Sample N.	Range	1 ÷ 50	1 ÷ 50
	Default	1	1
	Level	ADVANCED	
	Address	243	
	Function	Number of samples to acquire for the statistic computation of the data to store. If this parameter is set to 1, no statistic operation takes place and the sample is just stored as data.	

C244 Slow Log Min. Variation Percent

C244			
Slow Log Min. Variation Percent	Range	0 ÷ 65535	0.0 ÷ 6553.5 %
	Default	0	0.0 %
	Level	ADVANCED	
	Address	244	
	Function	Variance for the data storage to the FLASH CARD. When C244 is other than 0, logging occurs if at least one of the variables to be acquired varies from the last logging of a value percent (considered as raw data) which is higher than C244.	

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I160 Logging Command

I160	Range	0 ÷ 6	0: No command 1: Device SCAN 2: STOP Scanning 3: ENABLE All Logs 4: STOP All Logs 5: DISABLE All Logs 6: ERASE All Logs
Logging Command	Default	This is not a parameter: I160 is set to zero at power on and whenever the EEPROM command is executed.	
	Level	ADVANCED	
	Address	160	
	Function	**This input allows activating any LOGGING operation.** **1: Device SCAN**, scans the devices connected to ES851 based on the Routing Table (see relevant parameter) and BOXING. **2: STOP Scanning**, SCANNING is suspended; no BOXING takes place. **3: ENABLE All Logs**, LOGGING is activated. **4: STOP All Logs**, temporary suspension of the LOGGING function, which will be automatically resumed 2 minutes later. **5: DISABLE All Logs**, LOGGING is deactivated. **6: ERASE All Logs**, the entire FLASH CARD dedicated to LOGGING is cleared.	

Tabella formattata

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M5049 LOGGING Command Status

M5049	Range	0 ÷ 14, 25 ÷ 31	0: Command Executed 1: Scan Impossible, Active Logs 2: Scan in Progress 3: Logs Locked, Active Upload 4: Logs Locked, Logs Already Active 5: Stop Logs Impossible, Inactive Logs 6: Erase Log Impossible, Active Upload 7: Erase Log Impossible, Active Logs 8: Disable Logs Imposs., Active Upload 9: Disable Logs Imposs., Inactive Logs 10: Boxing in Progress 11: Scan Finished 12: Busy 13: Enable Log Impossible, Erasing 14: Erasing Imposs., Early Warning Active 25: Erase Log 1 26: Erase Log 2 27: Erase Log 3 28: Erase Log 4 29: Erase Log 5 30: Erase Log 6 31: Erase Event Log
LOGGING Command Status	Level	ADVANCED	
	Address	5049	
	Function	Status and result of the LOGGING commands.	

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M5016 N. of Devices Detected when SCANNING

M5016	Range	0 ÷ 50	0 ÷ 50
N. of Devices Detected when SCANNING	Level	ADVANCED	
	Address	5016	
	Function	Number of devices connected to ES851 detected when SCANNING. The device number is automatically refreshed whenever a new device is detected. This measure is stored to non-volatile memory only and is cleared when ES851 is reset.	

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M5017 Address of the Device being SCANNED

M5017	**Range**	0 ÷ 247	0 ÷ 247
Address of the Device being SCANNED	**Level**	ADVANCED	
	Address	5017	
	Function	Current address that ES851 board is querying while SCANNING. This measure is stored to non-volatile memory only and is cleared when ES851 is reset.	

C300 ÷ C327 ID of the Connected Device

C300 ÷ C327	**Range**	0 ÷ 255	0 ÷ 255
ID of the Connected Device	**Default**	0	0
	Level	ADVANCED	
	Address	300, 303, …, 327 (one every three)	
	Function	The high byte of the parameters for these addresses represents the routing ID of the device detected when SCANNING. (Note: This is a read-only parameter).	

C301 ÷ C328 Type of Connected Device

C301 ÷ C328	**Range**	0 ÷ 100	0: No Device Detected 1: ST 2: SM 3: SG 4: D4 5: D7 6: AM 7: PV 8: PD 9: PM 10: PR 11: PT 12: NG 13: IP 14: DL 15: IK 16: VK 17: LK 18: AC	19: AS 20: DB 21: DC 22: IF 23: IP 24: IZ 25: LT 26: OD 27: PB 28: SF 29: VD 30: VM 31: VN 32: VT 33: AO 34: DI 35: DO 36: QF …. 100: Unknown Device
Type of Connected Device	**Default**	0	0: No Device Detected	
	Level	ADVANCED		
	Address	301, 304, …, 328 (one every three)		
	Function	The low byte of these parameters represents the type of device detected when SCANNING. If one or more of these parameters are manually set to 0 after scanning, the respective devices are ignored when LOGGING.		

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Tabella formattata

Formattato: Francese (Francia)

Formattato: Italiano (Italia)

M214 Connected Device Boxing

M214			
Connected Device Boxing	Range	Bit-controlled parameter.	See Table 8.
	Level	ADVANCED	
	Address	214	
	Function	If the j-th bit is worth 1, this means that the corresponding device is boxed (i.e. the device will be monitored by the Data Logger as its acquired variables have been added to the log's parameters). If the j-th bit is worth 0, it has not been boxed either because logs are full or because it has not been recognized.	

Modbus Address	Bits	Devices	Bit Description
214	0-15	1-16	If the i-th bit = 1, the i-th device is boxed.

Table 8: Bit-map of the devices boxed after SCANNING.

M215 Recognized Connected Device

M207, M208, M215			
Recognized Connected Device	Range	Bit-controlled parameter	See Table 9
	Level	ADVANCED	
	Address	215	
	Function	If the j-th bit is worth 1, this means that the corresponding device has been recognized by ES851 (i.e. it has the routing table for that device, which contains the log parameters values to be used when programming the Data Logger while BOXING; see APPENDIX). If the j-th bit is worth 0, the corresponding device has not been recognized because ES851 is not provided with the tables required.	

Modbus Address	Bits	Devices	Bit Description
215	0-15	1-16	If the i-th bit = 0, the i-th device is recognized.

Table 9: Bit-map of the recognized devices.

C241 Type of Logging for the Connected Device

C239, C240, C241			
Type of Logging for the Connected Device	Range	Bit-controlled parameter	See Table 10
	Default	0	Standard Logging for each device
	Level	ADVANCED	
	Address	241	
	Function	If the j-th bit is worth 1, this means that the type of logging for the connected device is "extended", otherwise, it is "standard". After SCANNING, ES851 board will assign the same value to all the devices that are recognized and boxed according to parameter C161. However, each value can be individually changed.	

Modbus Address	Bit	Devices	Bit Description
241	0-15	1-16	If the i-th bit= 1, extended logging is implemented for the i-th device

Table 10: Bit-map of the type of logging for the connected devices.

M512 Event 0 Fired for the Connected Device

M512			
Event 0 Fired for the Connected Device	Range	Bit-controlled parameter	See Table 11
	Default	65535	Event 0 fired for any device
	Level	ADVANCED	
	Address	512	
	Function	If the j-th bit is worth 1, event 0 is fired. This means that ES851 will NOT ignore this device when checking the connection status, and that this device can cause event 0 to fire.	

Modbus Address	Bits	Devices	Bit Description
512	0-15	1-16	If the i-th bit = 1, Event 0 for the i-th device has fired.

Table 11: Bit-map for Event 0 firing for the connected devices.

NOTE Event 0 is generated from the Data Logger when a device cannot be reached for 3 consecutive times.

P258 Boxing Enabled

P258			
Boxing Enabled	Range	0 ÷ 1	No ÷ Yes
	Default	1	Yes
	Level	ENGINEERING	
	Address	258	
	Function	It indicates if the mechanism for the automatic configuration of the logs at the end of the SCAN is active.	

6. SCAN DEVICE 11-40 MENU

This menu is an extension of the DATA LOGGING CONSOLE menu displaying only the first 10 detected devices. After scanning, the parameters relating to devices 11-40 are displayed.

Parameter	FUNCTION	Access Level	MODBUS Address
C330 ÷ C417	Connected Device ID	ADVANCED	330, 333, ..., 417 (one every three)
C331 ÷ C418	Type of the Connected Device	ADVANCED	331, 334, ..., 418 (one every three)
M204, M205	Boxing of the Connected Device	ADVANCED	204, 205
M207, M208	Recognition of the Connected Device	ADVANCED	207, 208
C239, C240	Logging for the "Extended" Connected Device	ADVANCED	239, 240
M510, M511	Event 0 Activated for the Connected Device	ADVANCED	510, 511

Table 12: List of parameters and measures, Scan Device 11-40

C330 ÷ C417 Connected Device ID

C175a ÷ C180a, C480a ÷ C503a	Range	0 ÷ 255	0 ÷ 255
Connected Device ID	Default	0	0
	Level	ADVANCED	
	Address	330, 333, ..., 417 (one every three)	
	Function	The high byte of the parameters at these addresses represents the routing ID of the device detected when SCANNING. IMPORTANT: This parameter is read-only.	

C331 ÷ C418 Type of Connected Device

C331 ÷ C418	Range	0 ÷ 100	0: No Device Detected 1: ST 2: SM 3: SG 4: D4 5: D7 6: AM 7: PV 8: PD 9: PM 10: PR 11: PT 12: NG 13: IP 14: DL 15: IK 16: VK 17: LK 18: AC	19: AS 20: DB 21: DC 22: IF 23: IP 24: IZ 25: LT 26: OD 27: PB 28: SF 29: VD 30: VM 31: VN 32: VT 33: AO 34: DI 35: DO 36: QF ... 100: Unknown Device
Type of Connected Device	Default	0	0: No Device Detected	
	Level	ADVANCED		
	Address	331, 334, ..., 418 (one every three)		
	Function	The low byte of these parameters indicates the type of device detected when SCANNING. If one or more of these parameters are manually set to 0, the respective devices are ignored from the LOGGING function.		

M204, M205 Boxing of the Connected Device

M204, M205	Range	Bit-controlled parameter	See Table 13
Boxing of the Connected Device	Level	ADVANCED	
	Address	204, 205	
	Function	If the j-th is worth 1, this means that the respective device has been boxed (i.e. the device will be monitored from the Data Logger, because the variables to be acquired have been entered in the log parameters). If the j-th bit is worth 0, this means that it has not been boxed either because logs are full or because it has not been recognized.	

Modbus Address	Bits	Connected Devices	Bit Description
204	0-8	33-40	If the i-th bit is worth 1, this means that the i-th device has been boxed
205	0-15	17-32	If the i-th bit is worth 1, this means that the i-th device has been boxed

Table 13: Bit-map of the devices boxed after SCANNING.

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Formattato: Non Evidenziato

M207, M208 Connected Device Recognized

M207, M208			
Connected Device Recognized	Range	Bit-controlled parameter	See Table 14
	Level	ADVANCED	
	Address	207, 208	
	Function	If the j-th bit is worth 0, this means that ES851 has recognized the connected device (i.e. ES851 contains a table including a parameter set which is unique to each device. These parameters are used for programming the Data Logger when BOXING is performed; see APPENDIX). If the j-th bit is worth 1, the connected device has not been recognized because ES851 does not contain the respective table with the parameter set.	

Modbus Address	Bits	Connected Devices	Bit Description
207	0-8	33-40	If the i-th bit is worth 0, this means that the i-th device has been boxed
208	0-15	17-32	If the i-th bit is worth 0, this means that the i-th device has been boxed

Table 14: Bit-map of the recognized devices.

C239, C240 Type of Logging of the Connected Device

C239, C240			
Type of Logging of the Connected Device	Range	Bit-controlled parameter	See Table 15
	Default	0	Standard log for each device
	Level	ADVANCED	
	Address	239, 240	
	Function	If the j-th is worth 1, this means that the type of logging for the device is "extended", otherwise it is "standard". After SCANNING, ES851 control board will assign the same value to all the devices recognized and boxed based on parameter C161. Each value can be individually changed.	

Modbus Address	Bit	Connected Devices	Bit Description
239	0-8	33-40	If the i-th bit is worth 1, this means that "extended" logging is performed for the i-th device
240	0-15	17-32	If the i-th bit is worth 1, this means that "extended" logging is performed for the i-th device

Table 15: Bit-map of the type of logging.

M510, M511 Event 0 Fired for the Connected Device

M510, M511			
Event 0 Fired for the Connected Device	Range	Bit-controlled parameter	See Table 16
	Default	65535	Event 0 fired for each device
	Level	ADVANCED	
	Address	510, 511	
	Function	If the j-th bit is worth 1, this means that event 0 is activated for the connected device. As a result, ES851 will NOT ignore the device when checking the connection status, so the device is likely to cause the event fired.	

Modbus Address	Bits	Connected Devices	Bit Description
510	0-8	33-40	If the i-th bit is worth 1, event "0" for the i-th event has fired
511	0-15	1-16	If the i-th bit is worth 1, event "0" for the i-th event has fired

Table 16: Bit-map of Event 0 fired for the connected devices.

7. UPLOAD CONSOLE MENU

The UPLOAD function allows viewing data stored while LOGGING. Upload is possible only if you are using the RemoteDrive/Sunway. The Upload function allows viewing the logs and their sizes and allows selecting the logs to be saved to your computer.
Select logs and press the Start button; the Windows menu for file save pops up, allowing choosing the file destination. All the log filenames have the same root (chosen by the user) and are automatically distinguished by the RemoteDrive/Sunway with an acronym (1, 2, 3, 4, 5, 6, evt) added at the end of the filename. Any log can be deleted after being uploaded from the Options menu in the RemoteDrive/Sunway (see RemoteDrive/Sunway User Manual).
Logs are stored in CSV (Comma Separated Values) format; the created files are read-only file. The RemoteDrive/Sunway also allows recorded data to be graphically represented.

Do the following to activate the Upload function:

- Press the "Scan Logs" button;
- Select the logs to be saved;
- Press Start. The Windows menu for file save pops up;
- Enter the path and name for the file(s) to be saved. The RemoteDrive/Sunway will automatically add the number of the selected log to its filename.
- Once files are saved, you can use the RemoteDrive/Sunway to display and/or graphically represent them (see RemoteDrive/Sunway User Manual).

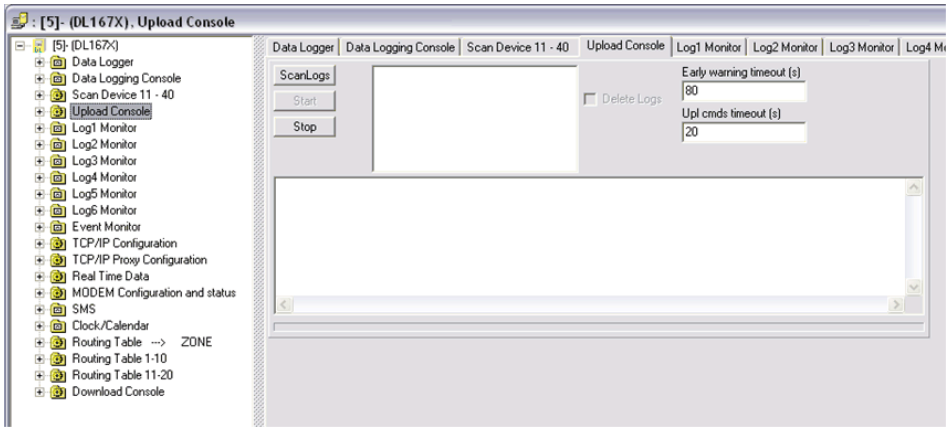

Figure 1: The RemoteDrive/Sunway UPLOAD Console.

8. LOG MONITOR MENU

The measures relating to the Log status are contained into 6 menus: "LOG1 MONITOR", "LOG2 MONITOR", "LOG3 MONITOR", "LOG4 MONITOR", "LOG5 MONITOR", "LOG6 MONITOR".

Parameter	FUNCTION	Access Level	MODBUS Address
M5050, M5051, M5052, M5053, M5054, M5055	Log Length	BASIC	5050, 5051, 5052, 5053, 5054, 5055
M5057, M5058, M5059, M5060, M5061, M5062	Log Status	BASIC	5057, 5058, 5059, 5060, 5061, 5062
M5070a-b, M5073a-b, M5076a-b, M5079a-b, M5082a-b, M5085a-b	Year and Month of Activation of the Log	BASIC	5070, 5073, 5076, 5079, 5082, 5085
M5071a-b, M5074a-b, M5077a-b, M5080a-b, M5083a-b, M5086a-b	Day and Time of Activation of the Log	BASIC	5071, 5074, 5077, 5080, 5083, 5086
M5072a-b, M5075a-b, M5078a-b, M5081a-b, M5084a-b, M5087a-b	Minutes and Seconds of Activation of the Logs	BASIC	5072, 5075, 5078, 5081, 5084, 5087

Table 17: List of the measures in the Log Monitor menu.

M5050 (M051, M5052, M5053, M5054, M5055) Log Length

M5050 (Log 1) M5051 (Log 2) M5052 (Log 3) M5053 (log 4) M5054 (Log 5) M5055 (Log 6)	Range	0 ÷ 2000	0 ÷ 2000 Kbyte
Log Length	Level	BASIC	
	Address	5050, 5051, 5052, 5053, 5054, 5055	
	Function	Length of the data stored to the FLASH CARD for each log (Kbytes).	

M5057 (M5058, M5059, M5060, M5061, M5062) Log Status

M5057 (Log 1) M5058 (Log 2) M5059 (Log 3) M5060 (Log 4) M5061 (Log 5) M5062 (Log 6)	Range	Bit-controlled measure	See Table 18
Log Status	Level	BASIC	
	Address	5057, 5058, 5059, 5060, 5061, 5062	
	Function	Current status of the logs.	

Bit N.	Status	Bit N.	Status
0	Empty Log	4	Locked Log
1	Active Log	9	Wrapped Log
2	Stopped Log	10	Log Data Fatally Corrupted
3	Checked Log		

Table 18: Bit-map of the Log Status.

M5070a (M073a, M5076a, M5079a, M5082a, M5085a) Year of Activation of the Log

M5070a (Log 1) M5073a (Log 2) M5076a (Log 3) M5079a (Log 4) M5082a (Log 5) M5085a (Log 6)	Range	0 ÷ 99	2000 ÷ 2099 Years
Year of Activation of the Log	Level	BASIC	
	Address	5070, 5073, 5076, 5079, 5082, 5085	
	Function	Year of activation of the log.	

M5070b (M073b, M5076b, M5079b, M5082b, M5085b, M5088b) Month of Activation of the Log

M5070b (Log 1) M5073b (Log 2) M5076b (Log 3) M5079b (Log 4) M5082b (log 5) M5085b (Log 6)	Range	1 ÷ 12	1: January 2. February 3: March 4: April 5: May 6: June 7: July 8: August 9: September 10: October 11: November 12: December
Month of Activation of the Log	Level	BASIC	
	Address	5070, 5073, 5076, 5079, 5082, 5085	
	Function	Month of activation of the log.	

M5071a (M074a, M5077a, M5080a, M5083a, M5086a) Day of Activation of the Log

M5071a (Log 1) M5074a (Log 2) M5077a (Log 3) M5080a (Log 4) M5083a (Log 5) M5086a (Log 6)	Range	1 ÷ 31	1 ÷ 31 Days
Day of Activation of the Log	Level	BASIC	
	Address	5071, 5074, 5077, 5080, 5083, 5086	
	Function	Day of activation of the log.	

M5071b (M074b, M5077b, M5080b, M5083b, M5086b) Time (Hours) of Activation of the Log

M5071b (Log 1) M5074b (Log 2) M5077b (Log 3) M5080b (Log 4) M5083b (Log 5) M5086b (Log 6)	Range	0 ÷ 23	0 ÷ 23 Hours
Time (Hours) of Activation of the Log	Level	BASIC	
	Address	5071, 5074, 5077, 5080, 5083, 5086	
	Function	Time of activation of the log (expressed in hours).	

M5072a (M075a, M5078a, M5081a, M5084a, M5087a) Time (Minutes) of Activation of the Log

M5072a (Log 1) M5075a (Log 2) M5078a (Log 3) M5081a (Log 4) M5084a (Log 5) M5087a (Log 6)	Range	0 ÷ 59	0 ÷ 59 min
Time (Minutes) of Activation of the Log	Level	BASIC	
	Address	5072, 5075, 5078, 5081, 5084, 5087	
	Function	Time of activation of the log (expressed in minutes).	

M5072b (M075b, M5078b, M5081b, M5084b, M5087b) Time (Seconds) of Activation of the Log

M5072b (Log 1) M5075b (Log 2) M5078b (Log 3) M5081b (Log 4) M5084b (Log 5) M5087b (Log 6)	Range	0 ÷ 59	0 ÷ 59 sec
Time (Seconds) of Activation of the Log	Level	BASIC	
	Address	5072, 5075, 5078, 5081, 5084, 5087	
	Function	Time of activation of the log (expressed in seconds).	

9. EVENT MONITOR MENU

This menu contains the measures relating to the status of the Event Log. The Event Log records the events fired in each device controlled by the Data Logger. Unlike the logs covered in the previous section, the Event log cannot be graphically represented, but it can be viewed as a table from the RemoteDrive/Sunway software.

Parameter	FUNCTION	Access Level	MODBUS Address
M5056	EVT Log Length	BASIC	5056
M5063	EVT Log Status	BASIC	5063
M5088a-b	Year and Month of Activation of the EVT Log	BASIC	5088
M5089a-b	Day and Time of Activation of the EVT Log	BASIC	5089
M5090a-b	Minutes and Seconds of Activation of the EVT Log	BASIC	5090
M5200a	ID of the first device that fired event 0	ENGINEERING	5200

Table 19: List of the measures in the Event Monitor menu.

M5056 EVT Log Length

M5056			
EVT Log Length	Range	0 ÷ 2000	0 ÷ 2000 Kbyte
	Level	BASIC	
	Address	5056	
	Function	Length in Kbytes of the data stored to the FLASH CARD.	

M5063 EVT Log Status

M5063			
EVT Log Status	Range	Bit-controlled measure	See Table 18
	Level	BASIC	
	Address	5063	
	Function	Status of the EVT Log.	

Bit N.	Status	Bit N.	Status
0	EVT Log Empty	4	Locked Log
1	EVT Log Active	9	Wrapped Log
2	EVT Log Stopped	10	Log Data Fatally Corrupted
3	EVT Log Checked		

Table 20: Bit-map of the Log Status.

M5088a Year of Activation of the EVT Log

M5088a			
Year of Activation of the EVT Log	Range	0 ÷ 99	2000 ÷ 2099
	Level	BASIC	
	Address	5088	
	Function	Year of activation of the EVT Log.	

M5088b Month of Activation of the EVT Log

M5088b			
Month of Activation of the EVT Log	Range	1 ÷ 12	1: January 2. February 3: March 4: April 5: May 6: June 7: July 8: August 9: September 10: October 11: November 12: December
	Level	BASIC	
	Address	5088	
	Function	Month of activation of the EVT Log.	

M5089a Day of Activation of the EVT Log

M5089a			
Day of Activation of the EVT Log	Range	1 ÷ 31	1 ÷ 31 days
	Level	BASIC	
	Address	5089	
	Function	Day of Activation of the EVT Log.	

M5089b Time of Activation of the EVT Log

M5089b			
Time of Activation of the EVT Log	Range	0 ÷ 23	0 ÷ 23 hours
	Level	BASIC	
	Address	5089	
	Function	Time of Activation of the EVT Log.	

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M5090a Minutes of Activation of the EVT Log

M5090a	Range	0 ÷ 59	0 ÷ 59 min
Minutes of Activation of the EVT Log	Level	BASIC	
	Address	5090	
	Function	Minutes of activation of the EVT Log.	

M5090b Seconds of Activation of the EVT Log

M5090b	Range	0 ÷ 59	0 ÷ 59 sec
Seconds of Activation of the EVT Log	Level	BASIC	
	Address	5090	
	Function	Seconds of activation of the EVT log.	

M5200a ID of the First Device that Fired Event 0

M5200a	Range	0 ÷ 255	0 ÷ 255
ID of the First Device that Fired Event 0	Level	BASIC	
	Address	5200	
	Function	The highest byte indicates the ID of the first device with active 0 event. If M5200a is 0, then event 0 is not active for any of the devices monitored.	

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10. MODBUS CONFIGURATION MENU

Two serial ports are implemented in ES851 control board. COM1 port is able to operate both as a standard RS232 port (default setting) and as a standard RS485 port, while port COM2 is a standard RS485 port.
If a different baud rate for ports COM1/COM2 is required, the ENGINEERING access level must be selected.

CAUTION If you need COM1 to operate as a standard RS485 port, you must state that **ONLY** when ordering the equipment, as this implies both software and hardware modifications.

The Modbus configuration by default of ports COM1 and COM2 is as follows:

Port	Default
COM1	Port enabled in Slave Modbus mode
COM2	Port enabled in Modbus mode

Table 21: Default settings for serial ports COM1 and COM2.

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NOTE You can change the configuration of Modbus COM 1 port by setting parameter R450 to one of the two values relating to serial communications, i.e. "9: Local Serial Slave" or "10: Local Serial Master".

CAUTION The parameters in this menu are "R" parameters; they activate only when the device is next powered on.

When multiple ES851 control boards are installed in a PV field, it can be necessary to change their addresses to avoid conflicts. To do so, parameter R297 must be changed following the procedure below.

Parameter	FUNCTION	Access Level	MODBUS Address
R297	ES851 Device ID	ADVANCED	**297**

Table 22: Parameter in the Modbus configuration menu.

R297 ES851 Device ID

R297			
ES851 Device ID	Range	0 ÷ 247	0 ÷ 247
	Default	1	1
	Level	ADVANCED	
	Address	297	
	Function	This parameter allows changing the ID of ES851 control board. When multiple ES851 control boards are installed in a PV field, it can be necessary to change their addresses to avoid conflicts.	

Procedure for changing the address of ES851 control board:

- Enter the new address for parameter R297;
- Disconnect ES851 control board;
- Reset ES851 control board;
- Connect ES851 control board using the new address;
- Manually disable the old address. Please refer to the ROUTING TABLE 1-10 MENU.

In ENGINEERING mode it is possible to configure COM1 and COM2 at low level.

Parameter	FUNCTION	Access Level	MODBUS address
R218	COM1 Type	ENGINEERING	**218**
R260	COM1 Configuration	ENGINEERING	**260**
R261	COM1 Baudrate	ENGINEERING	**261**
R262	COM1 Parity	ENGINEERING	**262**
R263	COM1 Lag Time Between Packets	ENGINEERING	**263**
R264	COM1 Timeout	ENGINEERING	**264**
R265	COM2 Configuration	ENGINEERING	**265**
R266	COM2 Baudrate	ENGINEERING	**266**
R267	COM2 Parity	ENGINEERING	**267**
R268	COM2 Lag Time Between Packets	ENGINEERING	**268**
R269	COM2 Timeout	ENGINEERING	**269**
R213	COM2 RTS Signal Polarity	ENGINEERING	**213**

Table 23: Serial port configuration parameters of ENGINEERING level

P218 COM1 Type

P218	**Range**	0 ÷ 1	RS232 ÷ RS485
COM1 Type	**Default**	0	RS232
	Level	ENGINEERING	
	Address	218	
	Function	It indicates whether the first serial port should operate as RS232 or RS485.	

P260 COM1 Configuration

P260	**Range**	0 ÷ 2	0: Modbus disabled 1: Modbus enabled in slave mode 2: Modbus enabled in master mode
COM1 Configuration	**Default**	1	Modbus enabled in slave mode
	Level	ENGINEERING	
	Address	260	
	Function	It indicates if the first serial port is enabled in Modbus slave protocol, Modbus master, or if it is free.	

P261 COM1 Baudrate

P261	**Range**	1 ÷ 8	1: 1200bps 2: 2400bps 3: 4800bps 4: 9600bps 5: 19200bps 6: 38400bps 7: 57600bps 8: 115200bps
COM1 Baudrate	**Default**	6	38400bps
	Level	ENGINEERING	
	Address	261	
	Function	It indicates the baudrate of the first serial port.	

P262 COM1 Parity

P262	**Range**	0 ÷ 4	0: no parity 1 stop bit 1: even parity 1 stop bit 2: odd parity 1 stop bit 3: mark parity 2 stop bits 4: space parity 2 stop bits
COM1 Parity	**Default**	3	mark parity 2 stop bits
	Level	ENGINEERING	
	Address	262	
	Function	It indicates the parity bit of the first serial port.	

P263 COM1 Lag Time Between Packets

P263	**Range**	1 ÷ 50	1 ms ÷ 50 ms
COM1 Lag Time Between Packets	**Default**	20	20 ms
	Level	ENGINEERING	
	Address	263	
	Function	It indicates the lag time between packets for the first serial port.	

P264 COM1 Timeout

P264	**Range**	1 ÷ 1000	1 ms ÷ 1000 ms
COM1 Timeout	**Default**	500	500 ms
	Level	ENGINEERING	
	Address	264	
	Function	It indicates the timeout for the first serial port.	

P265 COM2 Configuration

P265	**Range**	0 ÷ 2	0: Modbus disabled 1: Modbus enabled in slave mode 2: Modbus enabled in master mode
COM2 Configuration	**Default**	1	Modbus enabled in slave mode
	Level	ENGINEERING	
	Address	265	
	Function	It indicates if the second serial port is enabled in Modbus slave protocol, Modbus master, or if it is free.	

P266 COM2 Baudrate

P266	**Range**	1 ÷ 8	1: 1200bps 2: 2400bps 3: 4800bps 4: 9600bps 5: 19200bps 6: 38400bps 7: 57600bps 8: 115200bps
COM2 Baudrate	**Default**	6	38400bps
	Level	ENGINEERING	
	Address	266	
	Function	It indicates the baudrate of the second serial port.	

P267 COM2 Parity

P267	Range	0 ÷ 4	0: no parity 1 stop bit 1: even parity 1 stop bit 2: odd parity 1 stop bit 3: mark parity 2 stop bits 4: space parity 2 stop bits
COM2 Parity	Default	3	mark parity 2 stop bits
	Level	ENGINEERING	
	Address	267	
	Function	It indicates the parity bit of the second serial port.	

P268 COM2 Lag Time Between Packets

P268	Range	1 ÷ 50	1 ms ÷ 50 ms
COM2 Lag Time Between Packets	Default	20	20 ms
	Level	ENGINEERING	
	Address	268	
	Function	It indicates the lag time between packets for the second serial port.	

P269 COM2 Timeout

P269	Range	1 ÷ 1000	1 ms ÷ 1000 ms
COM2 Timeout	Default	500	500 ms
	Level	ENGINEERING	
	Address	269	
	Function	It indicates the timeout for the second serial port.	

COM2 RTS Signal Polarity

P213	Range	0 ÷ 1	0: enable with higher signal 1: enable with lower signal
COM2 RTS Signal Polarity	Default	1	enable with lower signal
	Level	ENGINEERING	
	Address	213	
	Function	It indicates the polarity of the RTS signal for the second serial port.	

11. CONNECTION CONFIGURATION MENU

This is the main menu for configuring the connections of the ES851 board.
Parameter R450 contained in this menu allows to easily configure the connections available for ES851 control board by means of a selection menu that automatically sets all the parameters related to the desired type of connection.
The menu options allow choosing between several Ethernet connections, depending on the presence and use of the DNS and DHCP protocols.
The other parameters are to be programmed for Ethernet connections where the DHCP (proxy connection) is not present or cannot be used.
Parameter R270 can be used only to disable the connection service to the Link.

CAUTION The following parameters are R parameters, which activate only after resetting the ES851 control board.

Parameter	FUNCTION	Access Level	MODBUS Address
R450	Type of Connection	ADVANCED	450
R270	Type of Proxy Connection	ADVANCED	270
R276, R277	IP address	ADVANCED	276, 277
R278, R279	Network Mask	ADVANCED	278, 279
R247, R248	Gateway	ADVANCED	247, 248
M5037	Connection Status of the RemoteDrive/Sunway	ADVANCED	5037
R271	TCP/IP Port	ENGINEERING	271

Table 24: List of the parameters in the TCP/IP Configuration menu.

R450 Type of Connection

R450	Range	1 ÷ 4	1: Proxy Ethernet (DHCP, DNS) 2: Proxy Ethernet (no DHCP, DNS) 3: Proxy Ethernet (no DHCP, no DNS) 4: Proxy Ethernet (DHCP, no DNS)
~~Tipo di connessione~~Type of Connection	Default	1	Proxy Ethernet (DHCP, DNS)
	Level	ADVANCED	
	Address	450	
	Function	This parameter sets the connectivity of ES851 Data Logger board. • Proxy Ethernet (DHCP, DNS): the Link service via the Internet is used for connection. The grid parameters are automatically obtained through a DHCP service, and the name of the Link server is resolved from a DNS service. • Proxy Ethernet (no DHCP, DNS): the Link service via the Internet is used for connection. The network is configured by setting parameters P276-P277 (IP address of ES851), P278-P279 (netmask of ES851) and R247-R248 (gateway of ES851). The name of the Link server is resolved from a DNS service. • Proxy Ethernet (no DHCP, no DNS): the Link service via the Internet is used for connection. The network is configured by setting parameters P276-P277 (IP address of ES851), P278-P279 (netmask of ES851) and R247-R248 (gateway of ES851). The Link server is referred to through its IP address. The -ENGINEERING access level is required.	

R270 Type of Proxy Connection

R270			
Type of Proxy Connection	Range	1 ÷ 2	1: Link Proxy OFF 2: Link Proxy ON
	Default	2	Link Proxy ON
	Level	ADVANCED	
	Address	270	
	Function	This parameter sets the use of the Link service by the Data Logger.	

R276 IP Address High

R276			
IP Address High	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
	Default	0xC0A8	192.168
	Level	ADVANCED	
	Address	276	
	Function	This parameter sets the two high bytes of the static IP address of ES851 board.	

R277 IP Address Low

R277			
IP Address Low	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
	Default	0x2	0.2
	Level	ADVANCED	
	Address	277	
	Function	This parameter sets the two low bytes of the static IP address of ES851 board.	

R278 IP Mask High

R278			
IP Mask High	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
	Default	0xFFFF	255.255
	Level	ADVANCED	
	Address	278	
	Function	This parameter sets the two high bytes of ES851 netmask.	

R279 IP Mask Low

R279			
IP Mask Low	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
	Default	0xFF00	255.0
	Level	ADVANCED	
	Address	279	
	Function	This parameter sets the two low bytes of ES851 netmask.	

R247 Gateway High

R247			
Gateway High	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
	Default	0x0000	0.0
	Level	ADVANCED	
	Address	247	
	Function	This parameter sets the two high bytes of ES851 gateway.	

Formattato: Non Evidenziato

Formattato: Non Evidenziato

Formattato: Tipo di carattere: Grassetto

Formattato: Non Evidenziato

Formattato: Non Evidenziato

R248 Gateway Low

R248	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
Gateway Low	Default	0x0000	0.0
	Level	ADVANCED	
	Address	248	
	Function	This parameter sets the two low bytes of ES851 gateway.	

R271 TCP/IP Port

R271	Range	2000 ÷ 10000	2000 ÷ 10000
TCP/IP Port	Default	6767	6767
	Level	ENGINEERING	
	Address	271	
	Function	Connection port for the Remote Drive in direct-connection mode.	

12. TCP/IP PROXY CONFIGURATION MENU

This menu includes some parameters and measures for the connection to the Internet via proxy server. In particular, this menu allows enabling the DHCP, writing the APN (for GPRS connections) and monitoring the DHCP status, the IP address assigned to ES851 and the IP address of the proxy server resolved by the DNS.

Parameter	FUNCTION	Access Level	MODBUS Address
M246	DHCP Enable	ENGINEERING	246
M5165 ÷ M5166	IP Address (from DHCP)	ENGINEERING	5165 ÷ 5166
M5092 ÷ M5093	Gateway IP Address (from DHCP)	ENGINEERING	5092 ÷ 5093
M5176	DHCP lease	ENGINEERING	5176
M5177	DHCP renew	ENGINEERING	5177
M596	DNS enable	ENGINEERING	596
R220 ÷ R221	Primary DNS	ENGINEERING	220 ÷ 221
R222 ÷ R223	Secondary DNS	ENGINEERING	222 ÷ 223
R597 ÷ R598	Proxy Static IP Address	ENGINEERING	597 ÷ 598
M560 ÷ M561	IP Address Solved and Stored	ENGINEERING	560 ÷ 561
R295	Keepalive Message Timeout	ENGINEERING	295
R599	Proxy TCP/IP Port	ENGINEERING	599
M5190	NCI Machine Status	ENGINEERING	5190
M5191	NCI Machine Sub-Status	ENGINEERING	5191
M5192	Proxy Connection Status	ENGINEERING	5192
M5193	Tunnel error	ENGINEERING	5193
M5194	Tunnel via Proxy to RD	ENGINEERING	5194
R3280 ÷ R3309	Proxy URL	ENGINEERING	3280 ÷ 3309

Table 25: List of the parameters in the TCP/IP Proxy Configuration menu.

Codice campo modificato

M246 DHCP Enable

M246	Range	0 ÷ 1	No ÷ Yes
DHCP Enable	Level	ENGINEERING	
	Address	246	
	Function	It indicates if the DHCP is enabled (DHCP can be configured through R450).	

M5165 IP Address (from DHCP) First Part

M5165	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
IP Address (from DHCP) First Part	Level	ENGINEERING	
	Address	5165	
	Function	It indicates the first two bytes of the Data Logger IP Address obtained through the DHCP.	

M5166 IP Address (from DHCP) Second Part

M5166	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
IP Address (from DHCP) Second Part	Level	ENGINEERING	
	Address	5166	
	Function	It indicates the second two bytes of the Data Logger IP Address obtained through the DHCP.	

M5092 IP Gateway Address (from DHCP) First Part

M5092	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
IP Gateway Address (from DHCP) First Part	Level	ENGINEERING	
	Address	5092	
	Function	It indicates the first two bytes of the Gateway IP address of the Data Logger obtained through the DHCP.	

M5093 IP Gateway Address (from DHCP) Second Part

M5093	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
IP Gateway Address (from DHCP) Second Part	Level	ENGINEERING	
	Address	5093	
	Function	It indicates the second two bytes of the Gateway IP address of the Data Logger obtained through the DHCP.	

M5176 DHCP Lease

M5176	Range	0 ÷ 65535	0 min ÷ 65535 min
DHCP Lease	Level	ENGINEERING	
	Address	5176	
	Function	It indicates the DHCP lease time in minutes.	

M5177 DHCP Renew

M5177	Range	0 ÷ 65535	0 min ÷ 65535 min
DHCP Renew	Level	ENGINEERING	
	Address	5177	
	Function	It indicates the DHCP renew time in minutes.	

M596 DNS Enable

M596	Range	0 ÷ 1	No ÷ Yes
DNS Enable	Level	ENGINEERING	
	Address	596	
	Function	It indicates if use of the DNS is enabled (DNS use can be configured through R450).	

R220 Primary DNS, First Part

R220	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
Primary DNS First Part	Default	0xD043	208.67
	Level	ENGINEERING	
	Address	220	
	Function	It defines the first two bytes of the IP address of the primary DNS (used when the DHCP is disabled and its information not used).	

R221 Primary DNS, Second Part

R221	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
Primary DNS Second Part	Default	0xDEDE	222.222
	Level	ENGINEERING	
	Address	221	
	Function	It defines the second two bytes of the IP address of the primary DNS (used when the DHCP is disabled and its information not used).	

R222 Secondary DNS, First Part

R222	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
Secondary DNS First Part	Default	0xD043	208.67
	Level	ENGINEERING	
	Address	222	
	Function	It defines the first two bytes of the IP address of the secondary DNS (used when the DHCP is disabled and its information not used).	

R223 Secondary DNS, Second Part

R223	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
Secondary DNS Second Part	Default	0xDCDC	220.220
	Level	ENGINEERING	
	Address	223	
	Function	It defines the second two bytes of the IP address of the secondary DNS (used when the DHCP is disabled and its information not used).	

R597 Proxy Static IP Address, First Part

R597	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
Proxy Static IP Address, First Part	Default	0xD5AE	213.174
	Level	ENGINEERING	
	Address	597	
	Function	It defines the first two bytes of the static IP address of the Proxy (used when the DNS is disabled or it is not possible to use it).	

R598 Proxy Static IP Address, Second Part

R598	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
Proxy Static IP Address, Second Part	Default	0xB29C	178.156
	Level	ENGINEERING	
	Address	598	
	Function	It defines the second two bytes of the static IP address of the Proxy (used when the DNS is disabled or it is not possible to use it).	

M560 IP Address Solved and Stored, First Part

M560	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
IP Address Solved and Stored, First Part	Level	ENGINEERING	
	Address	560	
	Function	It indicates the first two bytes of the IP Address of the Proxy solved through the DNS and used as first try in case the DNS is enabled but not used.	

M561 IP Address Solved and Stored, Second Part

M561	Range	0 ÷ 0xFFFF	0.0 ÷ 255.255
IP Address Solved and Stored, Second Part	Level	ENGINEERING	
	Address	561	
	Function	It indicates the second two bytes of the IP Address of the Proxy solved through the DNS and used as first try in case the DNS is enabled but not used.	

R295 Keepalive Message Timeout

R295	Range	0 ÷ 65535	Disabled, 1 min ÷ 65535 min
Keepalive Message Timeout	Default	5	5 min
	Level	ENGINEERING	
	Address	295	
	Function	It defines the interval in minutes at which the Data Logger, in Proxy-connection mode, should send the Keepalive message. Note: If the parameter is set to 0, delivery of keepalive and logsnapshot messages is disabled.	

R599 Proxy TCP/IP Port

R599	Range	0 ÷ 65535	0 ÷ 65535
Proxy TCP/IP Port	Default	15100	15100
	Level	ENGINEERING	
	Address	599	
	Function	Port for the connection to the Proxy of the Link service.	

M5190 NCI Machine Status

M5190	Range	0 ÷ 65535	0 ÷ 65535
NCI Machine Status	Level	ENGINEERING	
	Address	5190	
	Function	It indicates the status of the Data Logger with respect to the Proxy connection: 0: waiting for a command 1: connecting to the proxy 2: tunnel activation 3: ppp disconnection (only if connected as ppp).	

M5191 NCI Machine Sub-Status

M5191	Range	0 ÷ 65535	0 ÷ 65535
NCI Machine Sub-Status	Level	ENGINEERING	
	Address	5191	
	Function	It indicates the sub-status of the Data Logger when status (M5192) is "connecting to the proxy": 0: proxy URL resolution through DNS 1: connecting to the server 2: decoding server response 3: building and delivering the response to the server 4: connection status termination 5: SMS delivery failed 6: building the response	

M5192 Proxy Connection Status

M5192	Range	0 ÷ 65535	0 ÷ 65535
Proxy Connection Status	Level	ENGINEERING	
	Address	5192	
	Function	It indicates the error detected during the last connection to the Proxy: 0: no error 1: error on TCP/IP socket low level 2: DNS name not solved 3: generic Proxy connection error 4: timeout while waiting communication with the Proxy 5: R/W error with the Proxy 6: tunnel connection error 7: tunnel connection timeout error 8: R/W error in the tunnel with RD 9: Proxy response 'bad http' 10: Proxy response 'not authorized' 11: Proxy response 'not found' 12: Proxy response 'bad param' 13: Proxy response unknown error 14: Proxy response 'tunnelling not possible' 15: Proxy numerical address not defined and DNS disabled 16: timezone not found	

M5193 Tunnel Error

M5193	Range	0 ÷ 65535	0 ÷ 65535
Tunnel Error	Level	ENGINEERING	
	Address	5193	
	Function	It indicates the last error detected in the Remote Drive control tunnel: 6: timeout 7: pipe error	

M5194 Tunnel via Proxy to RD

M5194	Range	0 ÷ 65535	0 ÷ 65535
Tunnel via Proxy to RD	Level	ENGINEERING	
	Address	5194	
	Function	It indicates if the remote monitoring tunnel through Remote Drive is active: 0: not active 1: active 2: closing tunnel	

R3280 ÷ R3309 Proxy URL

P3280 ÷ R3309	Range	60-characters string	
Proxy URL	Default	'link.elettronicasanterno.it'	'link.elettronicasanterno.it'
	Level	ENGINEERING	
	Address	3280 ÷ 3309	
	Function	Proxy URL (server Link) to be used when the DNS is active	

13. REAL TIME DATA MENU

The Real Time Data menu allows configuring ES851 Data Logger when the Link service is activated (more details are given in the REMOTE MONITORING SERVICES User Manual).
The Data Logger periodically sends the last valid record of every log to the Link server. Some status variables of the Data Logger itself are also sent to the Link server. This menu also configures the time period (in minutes) for sending real-time data to the Link server, which is used for the Realtime service of the Remote Monitoring service.

Parameter	FUNCTION	Access Level	MODBUS Address
P578	Time Period (min.) for Sending Real-time Data	ADVANCED	578

Table 26: Parameter in the Real Time Data menu.

P578 Time Period (min.) for Sending Real-time Data

P578			
Time Period (min.) for Sending Real-time Data	Range	5 ÷ 1440	5 ÷ 1440 min (24 h)
	Default	1441	Data send disabled
	Level	ADVANCED	
	Address	578	
	Function	This parameter defines the time period (minutes) for sending real-time data.	

14. SMS MENU

ES851 Data Logger board sends an SMS each time an event is stored to the EVENT Log, provided that communication via GSM modem is allowed or that the Link Service via the Internet is activated. To activate this function, in parameters R420, R421, R422 enter the mobile phone number receiving SMS. The SMS sent contains information about the event fired. SMS can be sent only if the LOGGING function is active, otherwise, events cannot be either monitored or logged.

CAUTION The parameters contained in this menu are R parameters, which activate only after resetting ES851 control board.

Any SMS has the following format:

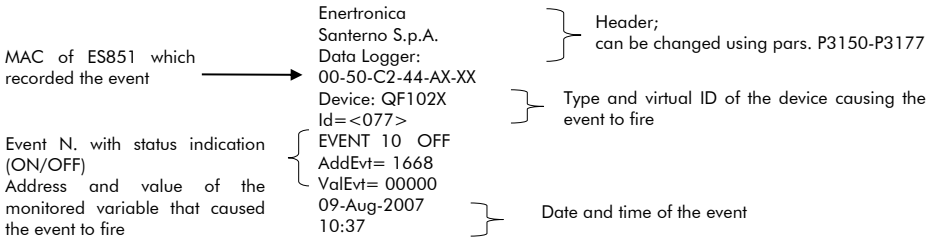

Figure 2: SMS format.

NOTE You can configure how to send SMS with the Link service (P580) when establishing a connection via a GPRS modem and for any other type of connection using the Link service. Please contact Enertronica Santerno S.p.A. to configure the SMS format.

Parameter	FUNCTION	Access Level	MODBUS Address
M5066	SMS Status	ADVANCED	5066
P3150 ÷ P3177	SMS Header	ADVANCED	3150 ÷ 3177

Table 27: List of the measures and parameters in the SMS menu

M5066 SMS Status

M5068a	**Range**	0 ÷ 2,4,5	0: No SMS 1: SMS Sent 2: No Digital Modem 3: Modem Not initialized 4: Modem Init KO 5: SMS KO 6: Connection Busy
SMS Status	**Level**	ADVANCED	
	Address	5066	
	Function	This measure indicates the status of the SMS function. **0: No SMS**, No SMS sent. **1: SMS Sent**, Successful SMS. **2: No Digital Modem**, No digital modem is connected, so the SMS function cannot be executed. **3: Modem Not Initialized**, The connected modem is not initialized; no SMS can be sent. **4: Modem Init KO**, Modem initialization failed; no SMS can be sent. **5: SMS KO**, SMS failed. **6: Connection Busy**, SMS will be sent later because the modem connection is busy.	

P3150 ÷ P3177 SMS Header

P3150 ÷ P3177	**Range**	48-character string (ASCII encoding)	
SMS Header	**Default**	Enertronica Santerno S.p.A. Data Logger:	
	Level	ADVANCED	
	Address	3150 ÷ 3177	
	Function	This parameter includes three words and the header of the SMS sent by the Data Logger when an event fires.	

Formattato: Non Evidenziato

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Formattato: Italiano (Italia)

Formattato: Italiano (Italia)

Formattato: Non Evidenziato

15. CLOCK/CALENDAR MENU

This menu allows updating the clock/calendar of ES851 Data Logger.
ES851 is not currently considering daylight saving time.
It displays its clock/calendar in measure parameters M5010 to M5013. To change the clock/calendar settings, execute a special command (I2013) after storing the new settings of the clock/calendar in parameters P0210 to P2012.

CAUTION When the Data Logger is connected to the Link Service, the date and time is automatically set up, so the parameters below must not be changed!

Parameter	FUNCTION	Access Level	MODBUS Address
P2010a	Year To Be Changed	ADVANCED	2010
P2010b	Month To Be Changed	ADVANCED	2010
P2011a	Day Of The Week To Be Changed	ADVANCED	2011
P2011b	Day Of The Month To Be Changed	ADVANCED	2011
P2012a	Time (Hour) To Be Changed	ADVANCED	2012
P2012b	Time (Minutes) To Be Changed	ADVANCED	2012
I2013b	Clock/Calendar Editing Command	ADVANCED	2013
M5010a	Year	BASIC	5010
M5010b	Month	BASIC	5010
M5011a	Day of the Week	BASIC	5011
M5011b	Day of the Month	BASIC	5011
M5012a	Hours	BASIC	5012
M5012b	Minutes	BASIC	5012
M5013	Seconds	BASIC	5013
P3200	Time Lag (Hours) of the Local Time Zone	ADVANCED	3200
P3201	Time Lag (Minutes) of the Local Time Zone	ADVANCED	3201

Table 28: List of the measures and parameters in the Clock/Calendar menu.

P2010a Year To Be Changed

P2010a			
Year To Be Changed	Range	0 ÷ 99	2000 ÷ 2099 Year
	Default	0	2000
	Level	ADVANCED	
	Address	2010	
	Function	The high byte of this parameter contains the value of the year to be changed.	

P2010b Month To Be Changed

P2010b	Range	1 ÷ 12	1: January 2. February 3: March 4: April 5: May 6: June 7: July 8: August 9: September 10: October 11: November 12: December
Month To Be Changed	Default	1	1: January
	Level	ADVANCED	
	Address	2010	
	Function	The low byte of this parameter contains the value of the month to be changed.	

P2011a Day of the Week To Be Changed

P2011a	Range	1 ÷ 7	1: Mon 2: Tues 3: Wed 4: Thur 5: Fri 6: Sat 7: Sun
Day of the Week To Be Changed	Default	1	1: Mon
	Level	ADVANCED	
	Address	2011	
	Function	The high byte of this parameter contains the value of the day of the week to be changed.	

P2011b Day of the Month To Be Changed

P2011b	Range	1 ÷ 31	1 ÷ 31 Days
Day of the Month To Be Changed	Default	1	1
	Level	ADVANCED	
	Address	2011	
	Function	The low byte of this parameter contains the value of the day of the month to be changed.	

P2012a Time (Hour) To Be Changed

P2012a	Range	0 ÷ 23	0 ÷ 23 hours
Time (Hour) To Be Changed	Default	0	0
	Level	ADVANCED	
	Address	2012	
	Function	The high byte of this parameter contains the time (hours) to be changed.	

Formattato: Non Evidenziato

Formattato: Non Evidenziato

Formattato: Non Evidenziato

Formattato: Non Evidenziato

P2012b Time (Minutes) To Be Changed

P2012b			
Time (Minutes) To Be Changed	Range	0 ÷ 59	0 ÷ 59 minutes
	Default	0	0
	Level	ADVANCED	
	Address	2012	
	Function	The low byte of this parameter contains the value of the time (minutes) to be changed.	

I2013 Clock/Calendar Editing Command

P2013			
Clock/Calendar Editing Command	Range	0 ÷ 1	0 ÷ 1
	Default	0	0
	Level	ADVANCED	
	Address	2013	
	Function	If this parameter is set to 1, all values set in parameters P2010 to P2012 are written and stored to the clock/calendar of ES851 and measures M5010 to M5012 are instantly changed. CAUTION Unchanged parameters are also written to the clock/calendar. Make sure that unchanged parameters are correct.	

M5010a Year

M5010a			
	Range	0 ÷ 99	2000 ÷ 2099
	Level	BASIC	
	Address	5010	
	Function	Year.	

M5010b Month

M5010b			
	Range	1 ÷ 12	1: January 2. February 3: March 4: April 5: May 6: June 7: July 8: August 9: September 10: October 11: November 12: December
	Level	BASIC	
	Address	5010	
	Function	Month.	

Formattato: Non Evidenziato

Formattato: Non Evidenziato

Tabella formattata

Formattato: Non Evidenziato

Tabella formattata

Formattato: Non Evidenziato

Formattato: Non Evidenziato

Formattato: Non Evidenziato

Formattato: Non Evidenziato

M5011a Day of the Week

M5011a	Range	1 ÷ 7	1: Mon 2: Tues 3: Wed 4: Thur 5: Fri 6: Sat 7: Sun
	Level	BASIC	
	Address	5011	
	Function	Day of the week.	

M5011b Day of the Month

M5011b	Range	1 ÷ 31	1 ÷ 31 Days
	Level	BASIC	
	Address	5011	
	Function	Day of the month.	

M5012a Hour

M5012a	Range	0 ÷ 23	0 ÷ 23 Hours
	Level	BASIC	
	Address	5012	
	Function	Hour.	

M5012b Minutes

M5012b	Range	0 ÷ 59	0 ÷ 59 Minutes
	Level	BASIC	
	Address	5012	
	Function	Minutes.	

M5013 Seconds

M5013	Range	0 ÷ 59	0 ÷ 59 Seconds
	Level	BASIC	
	Address	5013	
	Function	Seconds.	

P3200 Time Lag (Hours) of the Local Time Zone

P3200			
Time Lag (Hours) of the Local Time Zone	Range	-12 ÷ 13	-12 ÷ 13 hours
	Default	1	1 hour
	Level	ADVANCED	
	Address	3200	
	Function	This parameter sets the time lag (in hours) based on the GMT (Greenwich Mean Time).	

P3201 Time Lag (Minutes) of the Local Time Zone

P3201			
Time Lag (Minutes) of the Local Time Zone	Range	0 ÷ 59	0 ÷ 59 min
	Default	0	0 min
	Level	ADVANCED	
	Address	3201	
	Function	Along with P3200, this parameter sets the time lag (in minutes) based on the GMT.	

16. ROUTING TABLE → ZONE MENU

The Routing Table defines the map containing matches between the ID of the devices connected to ES851 through a given medium (e.g. RS485) and the virtual ID for the device response through ES851 board. A device network is then created; devices can be connected to different media and can be detected and controlled through ES851 in the same way.
When multiple ES851 control boards are networked together, their routing tables are to be properly programmed to avoid any address conflicts. Command I200 along with parameters P200 and P201 allows dividing the routing tables between ZONES with enabled addresses and "disabled" ZONES with no need to operate on each connected device. In that way, each ES851 is allocated to ZONES whose addresses are completely separate from each other.
The function described above is used for complex PV plants. They are virtually composed of ZONES comprising one ES851 control board, the inverter where it is installed and a variable number of monitoring devices (such as Smart String Boxes or I/Os). Each ZONE is characterised by a group of addresses that is assigned to physical devices.

NOTE

Conventionally, the Data Logger boards are assigned the smallest Modbus address within the Zone, while the inverter where the Data Logger is installed—that has a privileged connection through a dedicated medium (Dual Port RAM)— is assigned the address that comes next. See Table 29.

CAUTION

The MODBUS CONFIGURATION explains how to change the ID of ES851 Data Logger. The Modbus ID of the Data Logger must NOT range between the values given in parameters P200 and P201. Otherwise, command I200 fails.

NOTE

Once the address of ES851 has been changed and I200 command has been activated for the subsequent addresses, you have to set up the type of connection between ES851 Data Logger and the inverter where it is installed (ES821 DPR: Dual Port RAM). To do so, select the Engineering level; in the Routing table, change the parameter relating to the inverter address (see the ROUTING TABLE 1-10 MENU).

ZONE	ES851 Modbus Address	Inverter Modbus Address
1	23	24
2	45	46
3	67	68
4	89	90
5	111	112
6	133	134

Table 29: Conventional MODBUS addresses.

Parameter	FUNCTION	Access Level	MODBUS Address
P200	ZONE Start ID	ADVANCED	200
P201	ZONE End ID	ADVANCED	201
I200	Enable Zone Command	ADVANCED	160
M5049	Enable Zone Status	ADVANCED	5049

Table 30: List of the measures and parameters in the Routing Table ---> ZONE menu.

P200 ZONE Start ID

P200	Range	1 ÷ 160	1 ÷ 160
ZONE Start ID	Default	23	23
	Level	ADVANCED	
	Address	200	
	Function	Smallest Modbus address for the device detection.	

P201 ZONE End ID

P201	Range	1 ÷ 160	1 ÷ 160
ZONE End ID	Default	44	44
	Level	ADVANCED	
	Address	201	
	Function	Greatest Modbus address for the device detection.	

I200 Commands for Zone

I200	Range	0, 7	0: No cmd 7: Enable zone
Commands for Zone	Default	This is not a parameter. This input is set to 7 at power on and whenever the command is executed.	
	Level	ADVANCED	
	Address	160	
	Function	Zone enable command.	

M5049 Zone Executed

M5049	Range	0, 15 ÷ 17	0: None 15: Zone in progress 16: Zone OK 17: Zone KO
Zone Executed	Level	ADVANCED	
	Address	5049	
	Function	This measure shows the status of the Zone Enable command.	

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Formattato: Non Evidenziato
Formattato: Non Evidenziato
Formattato: Italiano (Italia), Non Evidenziato
Formattato: Non Evidenziato
Formattato: Non Evidenziato
Tabella formattata
Formattato: Non Evidenziato

17. ROUTING TABLE 1-10 MENU

This menu displays the configuration of the Routing Table from address 1 to address 10 and allows manual changes to the Routing Table.
The first two locations (Virtual Address 1 and Virtual Address 2) in the table are dedicated to ES851 board (factory presetting for Virtual Address 1) and to the inverter where ES851 is installed (Virtual Address 2). The remaining locations are free for the other devices connected to the plant.
Besides displaying the active devices, this menu also allows changing the zone configuration by individually selecting their valid Modbus addresses.

NOTE

The virtual addresses of the Routing Table are 160, but when the ADVANCED access level is selected, only the first 10 location of the Routing Table can be viewed. Select the ENGINEERING level to access the remaining locations.

Parameter	FUNCTION	Access Level	MODBUS Address
P00a ÷ P009a	Medium for Virtual Address 1-10	ADVANCED	**0 -9**
P00b ÷ P009b	Device ID for Virtual Address 1-10	ADVANCED	**0 -9**
P00c ÷ P009c	Virtual Address 1-10 Enable	ADVANCED	**0 -9**

Table 31: List of the parameters in the Routing Table menu.

P00a ÷ P009a Medium for Virtual Address 1-10

P00a ÷ P009a	Range	0 ÷ 3	0: ES851 Local 1: ES821 DPR 2: RS232 Modbus 3: RS485 Modbus
Medium for Virtual Address 1-10	Default	Virtual address 1: ES851 Local Virtual address 2: ES821 DPR Remaining virtual addresses: RS485 Modbus	
	Level	ADVANCED	
	Address	0 - 9	
	Function	You can select the medium for the virtual address assigned to this parameter.	

P00b ÷ P009b Device ID for Virtual Address 1-10

P00b ÷ P009b	Range	1 ÷ 247	1÷ 247
Device ID for Virtual Address 1-10	Default	Virtual Address 1: 1 Virtual Address 2: 1 Virtual Address i: i (i in 3 ÷10)	
	Level	ADVANCED	
	Address	0 - 9	
	Function	You can set up the real address of the device mapped to the virtual address assigned to this parameter.	

P00c ÷ P009c Virtual Address 1-10 Enable

	Range	0 ÷ 1	0: Virtual Address Disabled 1: Virtual Address Enabled
Virtual Address 1-10 Enable	Default	1	1: Virtual Address Disabled
	Level	ADVANCED	
	Address	0 -9	
	Function	You can enable or disable the map for the virtual address assigned to this parameter.	

Formattato: Non Tutto maiuscole

18. ROUTING TABLE 11-160 MENU

At ENGINEERING level it is possible to access a series of menus similar to the Routing Table 1-10 menus. Such menus contain a series of parameters of the same type as P00a, P00b, P00c. For further details, refer to chapter 17 ROUTING TABLE 1-10.

NOTE The tables below only specify the parameters for the Routing Table 11-20 menus. The following menus are equivalent.

Parameter	FUNCTION	Access Level	MODBUS Address
P10a ÷ P019a	Virtual Address Medium 11-20	ENGINEERING	10 -19
P10b ÷ P019b	Virtual Address Device ID 11-20	ENGINEERING	10 -19
P10c ÷ P019c	Virtual Address Enable 11-20	ENGINEERING	10 -19

Table 32: List of the parameters in the Routing Table 11-20 menus

P10a ÷ P19a Virtual Address Medium 11-20

P10a ÷ P19a	Range	0 ÷ 3	0: ES851 Local 1: ES821 DPR 2: RS232 Modbus 3: RS485 Modbus
Virtual Address Medium 11-20	Default	RS485 Modbus	
	Level	ENGINEERING	
	Address	10 – 19	
	Function	It defines the transmission medium for the virtual address associated with this parameter.	

P10b ÷ P19b Virtual Address Device ID 11-20

P10b ÷ P19b	Range	1 ÷ 247	1÷ 247
Virtual Address Device ID 11-20	Default	11 ÷ 20	11 ÷ 20
	Level	ENGINEERING	
	Address	10 – 19	
	Function	It defines the real address of the device mapped at the virtual address associated with this parameter.	

P10c ÷ P19c Virtual Address Enable 11-20

P10c ÷ P19c	Range	0 ÷ 1	0: virtual address disabled 1: virtual address enabled
Virtual Address Enable 11-20	Default	0	0: virtual address disabled
	Level	ENGINEERING	
	Address	10 – 19	
	Function	It indicates if the map for the virtual address associated with this parameter is active or not.	

19. LOG 1 MENU

This menu contains the general parameters for the configuration of Log 1. It is possible to enable or disable the log, setting its sampling time, the number of sampling to be stores, the number of data in the log record, and whether or not the data storage should occur only in case of any variations to the values.

CAUTION

Log parameters are also recorded by the boxing mechanism, if this mechanism is active. The parameters are overwritten at the end of the SCAN.
It is not possible to modify the parameters when the log is active.
Any modifications come into effect only upon next restarting of the log.
If the parameters differ from the previous recording, the Data Logger automatically deletes the log before starting.
It is possible to calculate the recording frequency of the log by multiplying the sampling time by the number of samples for storing (C701 x C702).

Parameter	FUNCTION	Access Level	MODBUS Address
C700	Storing Enable	ENGINEERING	**700**
C701	Sampling Time	ENGINEERING	**701**
C702	No. of Samples for storing	ENGINEERING	**702**
C703	% of Variation for Storing	ENGINEERING	**703**
C704	No. of data per record	ENGINEERING	**704**

Table 33: List of Log 1 general parameters

C700 Storing Enable

C700			
Storing Enable	Range	0 ÷ 1	Disabled ÷ Enabled
	Default	0	Disabled
	Level	ENGINEERING	
	Address	700	
	Function	It defines if log 1 is enabled or disabled.	

C701 Sampling time

C701			
Sampling time	Range	1 ÷ 65535	1 s ÷ 65535
	Default	3600	3600 s
	Level	ENGINEERING	
	Address	701	
	Function	It defines the sampling time for log 1.	

NOTE

C801 (log 2) has 3600s by default, as C701, while C901, C1001, C1201, C1301 (logs 3, 4, 5, 6) have 60s by default for the sampling time.

C702 Number of Samples for Storing

C702			
Number of Samples for Storing	Range	1 ÷ 50	1 ÷ 50
	Default	1	1
	Level	ENGINEERING	
	Address	702	
	Function	It defines the number of samplings that the Logger should process before storing the log. The value recorded for each datum is a function of the samples processed, and is defined independently for each datum by means of a specific parameter (Statistical Function).	

NOTE

It is possible to calculate the recording frequency of the log by multiplying the sampling time by the number of samples for storing (C701 x C702).

C703 % of Variation for Storing

C703			
% of Variation for Storing	Range	0 ÷ 1000	0.0% ÷ 100.0%
	Default	0	0
	Level	ENGINEERING	
	Address	703	
	Function	Offset value for the storage, in percentage. When this parameter is not 0, the storage occurs only if at least one of the values to be recorded differs from the previous recording by a higher value than that specified by the parameter (considering the value as a raw datum). If the parameter is set to 0, the data are always stored.	

C704 No. of Data per Record

C704			
No. of Data per Record	Range	1 ÷ 25	1 ÷ 25
	Default	5	5
	Level	ENGINEERING	
	Address	704	
	Function	It indicates the number of data to be sampled to make up the record of this log.	

20. LOG 1 D1 MENU

This menu allows displaying the parameters for the configuration of datum 1 of log 1.
Datum 1 is a multi-source datum, i.e. it allows for the setting of three sub-data (A, B, C) and the calculation of the final datum as a function of the three sub-data.

Parameter	FUNCTION	Access Level	MODBUS Address
C705	L1D1 Multiplier Coefficient K	ENGINEERING	**705**
C706	L1D1 Composition Function	ENGINEERING	**706**
C707	L1D1 Statistical Function	ENGINEERING	**707**
C708	L1D1-A Multiplier Coefficient Ka	ENGINEERING	**708**
C709a	L1D1-A Type of Datum	ENGINEERING	**709**
C709b	L1D1-A Word no.	ENGINEERING	**709**
C709c	L1D1-A Device ID	ENGINEERING	**709**
C710	L1D1-A Modbus Address	ENGINEERING	**710**
C711	L1D1-B Multiplier Coefficient Kb	ENGINEERING	**711**
C712a	L1D1-B Type of Datum	ENGINEERING	**712**
C712b	L1D1-B Word no.	ENGINEERING	**712**
C712c	L1D1-B Device ID	ENGINEERING	**712**
C713	L1D1-B Modbus Address	ENGINEERING	**713**
C714	L1D1-C Multiplier Coefficient Kc	ENGINEERING	**714**
C715a	L1D1-C Type of Datum	ENGINEERING	**715**
C715b	L1D1-C Word no.	ENGINEERING	**715**
C715c	L1D1-C Device ID	ENGINEERING	**715**
C716	L1D1-C Modbus Address	ENGINEERING	**716**
C798a	L1D1 % of Variation Disabled	ENGINEERING	**798**

Table 34: List of the parameters for datum 1 (multi-source) of log 1

C705 L1D1 Multiplier Coefficient K

C705			
L1D1 Multiplier Coefficient K	Range	0 ÷ 65535	0 ÷ 6553.5
	Default	10	1
	Level	ENGINEERING	
	Address	705	
	Function	Multiplier coefficient for datum 1 of log 1	

C706 L1D1 Composition Function

C706			
L1D1 Composition Function	Range	1 ÷ 7	1 ÷ 7
	Default	1	K*(a*Ka* + b*Kb* + c*Kc)
	Level	ENGINEERING	
	Address	706	
	Function	It indicates how to compose the three sub-data A, B, C to obtain datum 1. In the formulas, values of A, B, C are referred to with a, b, c K is C705, Ka is C708, Kb is C711, Kc is C714 1: K*(a*Ka* + b*Kb* + c*Kc) 2: K*(a*Ka * b*Kb + c*Kc) 3: K*((a*Ka) / b*Kb + c*Kc) 4: K*a*Ka * b*Kb * c*Kc 5: K*(a*Ka)/ (b*Kb* * c*Kc) 6: K*(a*Ka * b*Kb) / (c*Kc) 7: K/(a*Ka * b*Kb * c*Kc)	

C707 L1D1 Statistical Function

C707			
L1D1 Statistical Function	Range	0 ÷ 3	0 ÷ 3
	Default	0	Samples Average
	Level	ENGINEERING	
	Address	707	
	Function	It indicates how to compose the samples to obtain datum 1. This parameter is effective only if C702 is different from 1. 0: samples average 1: samples minimum 2: samples maximum 3: last sample	

C708 L1D1-A Multiplier Coefficient Ka

C708			
L1D1-A Multiplier Coefficient Ka	Range	0 ÷ 65535	-327.68 ÷ 327.67
	Default	100	1
	Level	ENGINEERING	
	Address	708	
	Function	Multiplier Coefficient for the sub-datum A of datum 1 of log 1 (see C706).	

C709a L1D1-A Type of Datum

C709a			
L1D1-A Type of Datum	Range	0 ÷ 1	Integer without sign ÷ Integer with sign
	Default	0	Integer without sign
	Level	ENGINEERING	
	Address	709	Bit 15
	Function	It defines whether the sub-datum A of datum 1 of log 1 is with or without sign.	

C709b L1D1-A Word no.

C709b			
L1D1-A Word no.	Range	0 ÷ 4	0 ÷ 4
	Default	0	16-bit word
	Level	ENGINEERING	
	Address	709	Bit 14-8
	Function	It indicates if the sub-datum A is a 16-bit datum or a word of a longer datum. 0: 16-bit word 1: word 0 of a multivariable 2: word 1 of a multivariable 3: word 2 of a multivariable 4: word 3 of a multivariable	

C709c L1D1-A Device ID

C709c			
L1D1-A Device ID	Range	0 ÷ 255	0 ÷ 255
	Default	0	0
	Level	ENGINEERING	
	Address	709	Bit 7-0
	Function	Modbus ID for the sub-datum A (if ID is 0, the sub-datum is not sampled and its value is 0).	

C710 L1D1-A Modbus Address

C710			
L1D1-A Modbus Address	Range	0 ÷ 65535	0 ÷ 65535
	Default	0	0
	Level	ENGINEERING	
	Address	710	
	Function	Modbus address for sub-datum A.	

C711 L1D1-B Multiplier Coefficient Kb

C711			
L1D1-B Multiplier Coefficient Kb	Range	0 ÷ 65535	-327.68 ÷ 327.67
	Default	100	1
	Level	ENGINEERING	
	Address	711	
	Function	Multiplier coefficient for the sub-datum B of datum 1 of log 1 (see C706).	

C712a L1D1-B Type of Datum

C712a	Range	0 ÷ 1	Integer without sign ÷ Integer with sign
L1D1-B Type of Datum	Default	0	Integer without sign
	Level	ENGINEERING	
	Address	712	Bit 15
	Function	It defines whether the sub-datum B of datum 1 of the log is with or without sign.	

C712b L1D1-B Word no.

C712b	Range	0 ÷ 4	0 ÷ 4
L1D1-B Word no.	Default	0	Word a 16 bit
	Level	ENGINEERING	
	Address	712	Bit 14-8
	Function	It indicates if the sub-datum B is a 16-bit datum or a word of a longer datum. 0: 16-bit word 1: word 0 of a multivariable 2: word 1 of a multivariable 3: word 2 of a multivariable 4: word 3 of a multivariable	

C712c L1D1-B Device ID

C712c	Range	0 ÷ 255	0 ÷ 255
L1D1-B Device ID	Default	0	0
	Level	ENGINEERING	
	Address	712	Bit 7-0
	Function	Modbus ID for the sub-datum B (if ID is 0, the sub-datum is not sampled and its value is 0).	

C713 L1D1-B Modbus Address

C713	Range	0 ÷ 65535	0 ÷ 65535
L1D1-B Modbus Address	Default	0	0
	Level	ENGINEERING	
	Address	713	
	Function	Modbus address for sub-datum B.	

C714 L1D1-C Multiplier Coefficient Kc

C714	Range	0 ÷ 65535	-327.68 ÷ 327.67
L1D1-C Multiplier Coefficient Kc	Default	100	1
	Level	ENGINEERING	
	Address	714	
	Function	Multiplier coefficient for sub-datum C of datum 1 of log 1 (see C706).	

C715a L1D1-C Type of Datum

C715a			
L1D1-C Type of Datum	Range	0 ÷ 1	Integer without sign ÷ Integer with sign
	Default	0	Integer without sign
	Level	ENGINEERING	
	Address	715	Bit 15
	Function	It defines whether the sub-datum C of datum 1 of the log is with or without sign.	

C715b L1D1-C Word no.

C715b			
L1D1-C Word no.	Range	0 ÷ 4	0 ÷ 4
	Default	0	16-bit word
	Level	ENGINEERING	
	Address	715	Bit 14-8
	Function	It indicates if the sub-datum C is a 16-bit datum or a word of a longer datum. 0: 16-bit word 1: word 0 of a multivariable 2: word 1 of a multivariable 3: word 2 of a multivariable 4: word 3 of a multivariable	

C715c L1D1-C Device ID

C715c			
L1D1-C Device ID	Range	0 ÷ 255	0 ÷ 255
	Default	0	0
	Level	ENGINEERING	
	Address	715	Bit 7-0
	Function	Modbus ID for the sub-datum C (if ID is 0, the sub-datum is not sampled and its value is 0).	

C716 L1D1-C Modbus Address

C716			
L1D1-C Modbus Address	Range	0 ÷ 65535	0 ÷ 65535
	Default	0	0
	Level	ENGINEERING	
	Address	716	
	Function	Modbus address for sub-datum C.	

C798a L1D1 % of Variation Disabled

C798a			
L1D1 % of Variation Disabled	Range	0 ÷ 65535	See Table 35
	Default	0	No
	Level	ENGINEERING	
	Address	798	
	Function	It indicates if the storage is disabled for datum 1 only in case of percentage variation (see C703).	

Modbus Address	Bit	Associated Data	Bit Meaning
798	0-15	1-16	If the i-th bit = 1 the variation control is disabled for the i-th datum

799	0-8	17-25	If the i-th bit = 1 the variation control is disabled for the i-th datum

Table 35: Bit-map for the enabling of the storage function on variation % data

21. LOG 1 D2 MENU

This menu allows displaying the parameters for the configuration of datum 2 of log 1.
Datum 2 is a multi-source datum, i.e. it allows for the setting of three sub-data (A, B, C) and the calculation of the final datum as a function of the three sub-data.

NOTE The parameters of this menu are equivalent to the ones of datum 1 as described in section 20 LOG 1 D1 MENU.

Parameter	FUNCTION	Access Level	MODBUS Address
C717	L1D2 Multiplier Coefficient K	ENGINEERING	717
C718	L1D2 Composition Function	ENGINEERING	718
C719	L1D2 Statistical Function	ENGINEERING	719
C720	L1D2-A Multiplier Coefficient Ka	ENGINEERING	720
C721a	L1D2-A Type of datum	ENGINEERING	721
C721b	L1D2-A Word no.	ENGINEERING	721
C721c	L1D2-A Device ID	ENGINEERING	721
C722	L1D2-A Modbus Address	ENGINEERING	722
C723	L1D2-B Multiplier Coefficient Kb	ENGINEERING	723
C724a	L1D2-B Type of datum	ENGINEERING	724
C724b	L1D2-B Word no.	ENGINEERING	724
C724c	L1D2-B Device ID	ENGINEERING	724
C725	L1D2-B Modbus Address	ENGINEERING	725
C726	L1D2-C Multiplier Coefficient Kc	ENGINEERING	726
C727a	L1D2-C Type of datum	ENGINEERING	727
C727b	L1D2-C Word no.	ENGINEERING	727
C727c	L1D2-C Device ID	ENGINEERING	727
C728	L1D2-C Modbus Address	ENGINEERING	728
C798b	L1D2 % of Variation Disabled	ENGINEERING	798

Table 36: List of parameters for datum 2 (multi-source) of log 1

22. LOG 1 D3-D8 MENU

This menu allows displaying the parameters for the configuration of data 3 to 8 of log 1.

NOTE

The parameters are repeated by groups of six for each datum.
Only the parameters for datum 3 are specified here, since the values are the same for the remaining parameters.

Parameter	FUNCTION	Access Level	MODBUS Address
C729, C732, C735, C738, C741, C744	L1D3 Statistical Function	ENGINEERING	729, 732, 735, 738, 741, 744
C730a, C733a, C736a, C739a, C742a, C745a	L1D3 Type of Datum	ENGINEERING	730, 733, 736, 739, 742, 745
C730b, C733b, C736b, C739b, C742b, C745b	L1D3 Word no.	ENGINEERING	730, 733, 736, 739, 742, 745
C730c, C733c, C736c, C739c, C742c, C745c	L1D3 Device ID	ENGINEERING	730, 733, 736, 739, 742, 745
C731, C734, C737, C740, C743, C746	L1D3 Modbus Address	ENGINEERING	731, 734, 737, 740, 743, 746
C798c, C798d, C798e, C798f, C798g, C798h	L1D3 % of Variation Disabled	ENGINEERING	798

Table 37: List of parameters for data 3 to 8 of log 1

C729 L1D3 Statistical Function

C729			
L1D3 Statistical Function	Range	0 ÷ 3	0 ÷ 3
	Default	0	Samples Average
	Level	ENGINEERING	
	Address	729	
	Function	It indicates how to compose the samples to obtain datum 3. This parameter is effective only if C702 is different from 1. 0: samples average 1: samples minimum 2: samples maximum 3: last sample	

C730a L1D3 Type of Datum

C730a			
L1D3 Type of Datum	Range	0 ÷ 1	Integer without sign ÷ Integer with sign
	Default	0	Integer without sign
	Level	ENGINEERING	
	Address	730	Bit 15
	Function	It defines whether datum 3 of log 1 is with or without sign.	

C730b L1D3-Word no.

C730b			
L1D3-Word no.	Range	0 ÷ 4	0 ÷ 4
	Default	0	16-bit word
	Level	ENGINEERING	
	Address	730	Bit 14-8
	Function	It indicates if the datum 3 of log 1 is a 16-bit datum or a word of a longer datum. 0: 16-bit word 1: word 0 of a multivariable 2: word 1 of a multivariable 3: word 2 of a multivariable 4: word 3 of a multivariable	

C730c L1D3 Device ID

C730c			
L1D3 Device ID	Range	0 ÷ 255	0 ÷ 255
	Default	0	0
	Level	ENGINEERING	
	Address	730	Bit 7-0
	Function	Modbus ID for datum 3 of log 1 (if ID is 0, the datum is not sampled and its value is 0).	

C731 L1D3 Modbus Address

C731			
L1D3 Modbus Address	Range	0 ÷ 65535	0 ÷ 65535
	Default	0	0
	Level	ENGINEERING	
	Address	731	
	Function	Modbus address for datum 3 of log 1.	

C798c L1D3 % of Variation Disabled

C798c			
L1D3 % of Variation Disabled	Range	0 ÷ 65535	See Table 35
	Default	0	No
	Level	ENGINEERING	
	Address	798	
	Function	It indicates if the storage function for datum 3 is disabled only in case of percentage variation (see C703).	

23. LOG 1 D9-D14 MENU

This menu allows displaying the parameters for the configuration of data 9 to 14 of log 1.

NOTA

The parameters are repeated by groups of six for each datum.
The same parameters of datum 3 apply (see section 22 LOG 1 D3-D8 MENU)

Parameter	FUNCTION	Access Level	MODBUS Address
C747, C750, C753, C756, C759, C762	L1D9 Statistical Function	ENGINEERING	747, 750, 753, 756, 759, 762
C748a, C751a, C754a, C757a, C760a, C763a	L1D9 Type of Datum	ENGINEERING	748a, 751a, 754a, 757a, 760a, 763a
C748b, C751b, C754b, C757b, C760b, C763b	L1D9 Word no.	ENGINEERING	748b, 751b, 754b, 757b, 760b, 763b
C748c, C751c, C754c, C757c, C760c, C763c	L1D9 Device ID	ENGINEERING	748c, 751c, 754c, 757c, 760c, 763c
C749, C752, C755, C758, C761, C764	L1D9 Modbus Address	ENGINEERING	749, 752, 755, 758, 761, 764
C798i, C798l, C798m, C798m, C798o, C798p	L1D9 % of Variation Disabled	ENGINEERING	798

Table 38: List of parameters for data 9 to 14 of log 1

24. LOG 1 D15-D20 MENU

This menu allows displaying the parameters for the configuration of data 15 to 20 of log 1.

NOTA

The parameters are repeated by groups of six for each datum.
The same parameters of datum 3 apply (see section 22 LOG 1 D3-D8 MENU)

Parameters	FUNCTION	Access Level	MODBUS Address
C765, C768, C771, C774, C777, C780	L1D15 Statistical Function	ENGINEERING	765, 768, 771, 774, 777, 780
C766a, C769a, C772a, C775a, C778a, C781a	L1D15 Type of Datum	ENGINEERING	766a, 769a, 772a, 775a, 778a, 781a
C766b, C769b, C772b, C775b, C778b, C781b	L1D15 Word no.	ENGINEERING	766b, 769b, 772b, 775b, 778b, 781b
C766c, C769c, C772c, C775c, C778c, C781c	L1D15 Device ID	ENGINEERING	766c, 769c, 772c, 775c, 778c, 781c
C767, C770, C773, C776, C779, C782	L1D15 Modbus Address	ENGINEERING	767, 770, 773, 776, 779, 782
C798q, C798r, C799a, C799b, C799c, C799d	L1D15 % of Variation Disabled	ENGINEERING	798, 799

Table 39: List of parameters for data 15 to 20 of log 1

25. LOG 1 D21-D25 MENU

This menu allows displaying the parameters for the configuration of data 21 to 25 of log 1.

NOTA

The parameters are repeated by groups of six for each datum.
The same parameters of datum 3 apply (see section 22 LOG 1 D3-D8 MENU)

Parameters	FUNCTION	Access Level	MODBUS Address
C783, C786, C789, C792, C795	L1D21 Statistical Function	ENGINEERING	783, 786, 789, 792, 795
C784a, C787a, C790a, C793a, C796a	L1D21 Type of Datum	ENGINEERING	784a, 787a, 790a, 793a, 796a
C784b, C787b, C790b, C793b, C796b	L1D21 Word no.	ENGINEERING	784b, 787b, 790b, 793b, 796b
C784c, C787c, C790c, C793c, C796c	L1D21 Device ID	ENGINEERING	784c, 787c, 790c, 793c, 796c
C785, C788, C791, C794, C797	L1D21 Modbus Address	ENGINEERING	785, 788, 791, 794, 797
C799e, C799f, C799g, C799h, C798i	L1D21 % of Variation Disabled	ENGINEERING	799

Table 40: List of parameters for data 21 to 25 of log 1

26. OTHER LOG-TYPE MENUS

Other log-type menus are available in the Data Logger for logs 2 to 6. Such menus are fully equivalent to the ones of log 1, as described in the previous sections.

Menu	FUNCTION	Access Level
Log 2	General parameters for log 2	ENGINEERING
Log 2 D1	Parameters for datum 1 of log 2	ENGINEERING
Log 2 D2	Parameters for datum 2 of log 2	ENGINEERING
Log 2 D3-D8	Parameters for data 3 to 8 of log 2	ENGINEERING
Log 2 D9-D14	Parameters for data 9 to 14 of log 2	ENGINEERING
Log 2 D15-D20	Parameters for data 15 to 20 of log 2	ENGINEERING
Log 2 D21-D25	Parameters for data 21 to 25 of log 2	ENGINEERING

Table 41: List of the menus for log 2

Menu	FUNCTION	Access Level
Log 3	General parameters for log 3	ENGINEERING
Log 3 D1	Parameters for datum 1 of log 3	ENGINEERING
Log 3 D2	Parameters for datum 2 of log 3	ENGINEERING
Log 3 D3-D8	Parameters for data 3 to 8 of log 3	ENGINEERING
Log 3 D9-D14	Parameters for data 9 to 14 of log 3	ENGINEERING
Log 3 D15-D20	Parameters for data 15 to 20 of log 3	ENGINEERING
Log 3 D21-D25	Parameters for data 21 to 25 of log 3	ENGINEERING

Table 42: List of the menus for log 3

Menu	FUNCTION	Access Level
Log 4	General parameters for log 4	ENGINEERING
Log 4 D1	Parameters for datum 1 of log 4	ENGINEERING
Log 4 D2	Parameters for datum 2 of log 4	ENGINEERING
Log 4 D3-D8	Parameters for data 3 to 8 of log 4	ENGINEERING
Log 4 D9-D14	Parameters for data 9 to 14 of log 4	ENGINEERING
Log 4 D15-D20	Parameters for data 15 to 20 of log 4	ENGINEERING
Log 4 D21-D25	Parameters for data 21 to 25 of log 4	ENGINEERING

Table 43: List of the menus for log 4

Menu	FUNCTION	Access Level
Log 5	General parameters for log 5	ENGINEERING
Log 5 D1	Parameters for datum 1 of log 5	ENGINEERING
Log 5 D2	Parameters for datum 2 of log 5	ENGINEERING
Log 5 D3-D8	Parameters for data 3 to 8 of log 5	ENGINEERING
Log 5 D9-D14	Parameters for data 9 to 14 of log 5	ENGINEERING
Log 5 D15-D20	Parameters for data 15 to 20 of log 5	ENGINEERING
Log 5 D21-D25	Parameters for data 21 to 25 of log 5	ENGINEERING

Table 44: List of the menus for log 5

Menu	FUNCTION	Access Level
Log 6	General parameters for log 6	ENGINEERING
Log 6 D1	Parameters for datum 1 of log 6	ENGINEERING
Log 6 D2	Parameters for datum 2 of log 6	ENGINEERING
Log 6 D3-D8	Parameters for data 3 to 8 of log 6	ENGINEERING
Log 6 D9-D14	Parameters for data 9 to 14 of log 6	ENGINEERING
Log 6 D15-D20	Parameters for data 15 to 20 of log 6	ENGINEERING
Log 6 D21-D25	Parameters for data 21 to 25 of log 6	ENGINEERING

Table 45: List of the menus for log 6

CAUTION

Log parameters are also recorded by the boxing mechanism, if this mechanism is active. The parameters are overwritten at the end of the SCAN.
It is not possible to modify the parameters when the log is active.
Any modifications come into effect only upon next restarting of the log.
If the parameters differ from the previous recording, the Data Logger automatically deletes the log before starting.

27. EVENT1 MENU

This menu contains the parameters for the configuration of event 1. Together, the configurations of the events 1 to 40 make up the Log Evt (event log) configuration.

CAUTION

Log parameters are also recorded by the boxing mechanism, if this mechanism is active. The parameters are overwritten at the end of the SCAN.
It is not possible to modify the parameters when the log is active.
Any modifications come into effect only upon next restarting of the log.
If the parameters differ from the previous recording, the Data Logger automatically deletes the log before starting.

NOTE

Event 1 occurs when the sampled trigger specified in **C1421** and **C1422** "differs" (with respect to function **C1420**) from the value specified in **C1423** by a max. value as per **C1424**.
When the condition turns from false to true an ON event is generated, when it turns back from true to false, an OFF event is generated.

Parameter	FUNCTION	Access Level	MODBUS Address
C520a	E1 Enable	ENGINEERING	**520**
C1420	E1 Threshold function	ENGINEERING	**1420**
C1421a	E1 Datum type trigger	ENGINEERING	**1421**
C1421c	E1 Device ID trigger	ENGINEERING	**1421**
C1422	E1 Modbus address trigger	ENGINEERING	**1422**
C1423	E1 Threshold value	ENGINEERING	**1423**
C1424	E1 Offset from threshold	ENGINEERING	**1424**
C1425a	E1D1 Type of datum	ENGINEERING	**1425**
C1425b	E1D1 Word no.	ENGINEERING	**1425**
C1425c	E1D1 Device ID	ENGINEERING	**1425**
C1426	E1D1 Modbus address	ENGINEERING	**1426**
C1427a	E1D2 Type of datum	ENGINEERING	**1427**
C1427b	E1D2 Word no.	ENGINEERING	**1427**
C1427c	E1D2 Device ID	ENGINEERING	**1427**
C1428	E1D2 Modbus address	ENGINEERING	**1428**

Table 46: Parameters of the Event1 menu

C520, C519, C518 Events 1-40 Enable

C518, C519, C520	Range	Bit-managed parameter	See Table 47
Events 1-40 Enable	Default	0	No event enabled
	Level	ENGINEERING	
	Address	518, 519, 520	
	Function	If the j-th bit is 1, then event j is active.	

Modbus Address	Bit	Associated Events	Bit Meaning
518	0-8	33-40	If bit i-th = 1 the i-th event is active
519	0-15	17-32	If bit i-th = 1 the i-th event is active
520	0-15	1-16	If bit i-th = 1 the i-th event is active

Table 47: Bit-map for events enable

C1420 E1 Threshold Function

C1420			
E1 Threshold Function	Range	0 ÷ 5	0 ÷ 5
	Default	0	Less than
	Level	ENGINEERING	
	Address	1420	
	Function	It indicates the threshold function to be used to define if event 1 has fired. Values available are: 0: < less than 1: <= less than or equal to 2: == equal to 3: >= greater than or equal to 4: > greater than 5: != different from	

C1421a E1 Datum Type Trigger

C1421a			
E1 Datum Type Trigger	Range	0 ÷ 1	Integer without sign ÷ Integer with sign
	Default	0	Integer without sign
	Level	ENGINEERING	
	Address	1421	Bit 15
	Function	It determines whether the trigger value of event 1 is with or without sign.	

C1421c E1 Device ID Trigger

C1421c			
E1 Device ID Trigger	Range	0 ÷ 255	0 ÷ 255
	Default	0	0
	Level	ENGINEERING	
	Address	1421	Bit 7-0
	Function	Modbus ID for trigger measurement of event 1 (if ID is 0, the datum is not sampled and its value is 0).	

C1422 E1 Modbus Address Trigger

C1422			
E1 Modbus Address Trigger	Range	0 ÷ 65535	0 ÷ 65535
	Default	0	0
	Level	ENGINEERING	
	Address	1422	
	Function	Modbus address for trigger measurement of event 1.	

C1423 E1 Threshold Value

C1423	Range	0 ÷ 65535	0 ÷ 65535
E1 Threshold Value	Default	0	0
	Level	ENGINEERING	
	Address	1423	
	Function	Threshold value for event 1.	

C1424 E1 Threshold Value Offset

C1424	Range	0 ÷ 65535	0 ÷ 65535
E1 Threshold Value Offset	Default	0	0
	Level	ENGINEERING	
	Address	1424	
	Function	Threshold value offset for event 1.	

C1425a E1D1 Type of Datum

C1425a	Range	0 ÷ 1	Integer without sign ÷ Integer with sign
E1D1 Type of Datum	Default	0	Integer without sign
	Level	ENGINEERING	
	Address	1425	Bit 15
	Function	It determines whether datum 1 to be sampled for event 1 of the event log is with or without sign.	

C1425b E1D1-Word no.

C1425b	Range	0 ÷ 4	0 ÷ 4
E1D1-Word no.	Default	0	16-bit word
	Level	ENGINEERING	
	Address	1425	Bit 14-8
	Function	It indicates if the datum 1 to be sampled for event 1 is a 16-bit datum or a word of a longer datum. 0: 16-bit word 1: word 0 of a multivariable 2: word 1 of a multivariable 3: word 2 of a multivariable 4: word 3 of a multivariable	

C1425c E1D1 Device ID

C1425c	Range	0 ÷ 255	0 ÷ 255
E1D1 Device ID	Default	0	0
	Level	ENGINEERING	
	Address	1425	Bit 7-0
	Function	Modbus ID for datum 1 to be sampled for event 1 (if ID is 0, the datum is not sampled and its value is 0).	

C1426 E1D1 Modbus Address

C1426	Range	0 ÷ 65535	0 ÷ 65535
E1D1 Modbus Address	Default	0	0
	Level	ENGINEERING	
	Address	1426	
	Function	Modbus Address for datum 1 to be sampled for event 1.	

C1427a E1D2 Type of Datum

C1427a	Range	0 ÷ 1	Integer without sign ÷ Integer with sign
E1D2 Type of Datum	Default	0	Integer without sign
	Level	ENGINEERING	
	Address	1427	Bit 15
	Function	It determines whether datum 2 to be sampled for event 1 of the event log is with or without sign.	

C1427b E1D2-Word no.

C1427b	Range	0 ÷ 4	0 ÷ 4
E1D2-Word no.	Default	0	16-bit word
	Level	ENGINEERING	
	Address	1427	Bit 14-8
	Function	It indicates if the datum 2 to be sampled for event 1 is a 16-bit datum or a word of a longer datum. 0: 16-bit word 1: word 0 of a multivariable 2: word 1 of a multivariable 3: word 2 of a multivariable 4: word 3 of a multivariable	

C1427c E1D2 Device ID

C1427c	Range	0 ÷ 255	0 ÷ 255
E1D2 Device ID	Default	0	0
	Level	ENGINEERING	
	Address	1427	Bit 7-0
	Function	Modbus ID for datum 2 to be sampled for event 1 (if ID is 0, the datum is not sampled and its value is 0).	

C1428 E1D2 Modbus Address

C1428	Range	0 ÷ 65535	0 ÷ 65535
E1D2 Modbus Address	Default	0	0
	Level	ENGINEERING	
	Address	1428	
	Function	Modbus address for datum 2 to be sampled for event 1.	

28. EVENT2-EVENT40 MENU

Menus from Event2 to Event40 contain the parameters for the configuration of the events next to 1. Together, these configurations make up the Event Log configuration. The parameters available in each menu are similar to the ones described for Event 1 in section 27 EVENT1 MENU.

Menu	FUNCTION	Access Level
Event2	Menu for Event 2	ENGINEERING
Event3	Menu for Event 3	ENGINEERING
Event4	Menu for Event 4	ENGINEERING
Event5	Menu for Event 5	ENGINEERING
Event6	Menu for Event 6	ENGINEERING
Event7	Menu for Event 7	ENGINEERING
Event8	Menu for Event 8	ENGINEERING
Event9	Menu for Event 9	ENGINEERING
Event10	Menu for Event 10	ENGINEERING
Event11	Menu for Event 11	ENGINEERING
Event12	Menu for Event 12	ENGINEERING
Event13	Menu for Event 13	ENGINEERING
Event14	Menu for Event 14	ENGINEERING
Event15	Menu for Event 15	ENGINEERING
Event16	Menu for Event 16	ENGINEERING
Event17	Menu for Event 17	ENGINEERING
Event18	Menu for Event 18	ENGINEERING
Event19	Menu for Event 19	ENGINEERING
Event20	Menu for Event 20	ENGINEERING
Event21	Menu for Event 21	ENGINEERING
Event22	Menu for Event 22	ENGINEERING
Event23	Menu for Event 23	ENGINEERING
Event24	Menu for Event 24	ENGINEERING
Event25	Menu for Event 25	ENGINEERING
Event26	Menu for Event 26	ENGINEERING
Event27	Menu for Event 27	ENGINEERING
Event28	Menu for Event 28	ENGINEERING
Event29	Menu for Event 29	ENGINEERING
Event30	Menu for Event 30	ENGINEERING
Event31	Menu for Event 31	ENGINEERING
Event32	Menu for Event 32	ENGINEERING
Event33	Menu for Event 33	ENGINEERING
Event34	Menu for Event 34	ENGINEERING
Event35	Menu for Event 35	ENGINEERING
Event36	Menu for Event 36	ENGINEERING
Event37	Menu for Event 37	ENGINEERING
Event38	Menu for Event 38	ENGINEERING
Event39	Menu for Event 39	ENGINEERING
Event40	Menu for Event 40	ENGINEERING

Table 48: List of the menus for the events 2 to 40

29. DOWNLOAD CONSOLE MENU

The Download function allows downloading the configuration files of the log parameters (see APPENDIX). This function is available only when using the RemoteDrive/Sunway software. The files contained in ES851 Data Logger can be individually deleted.

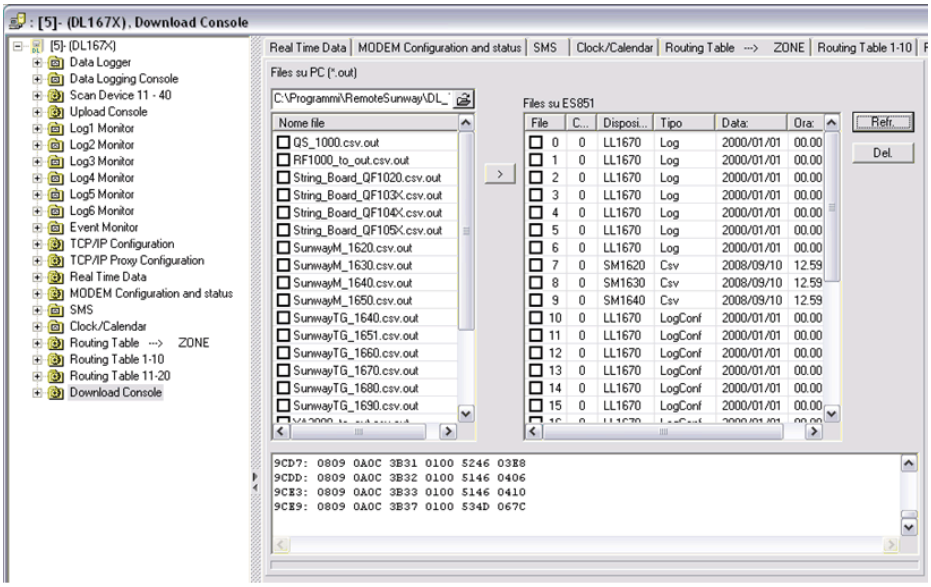

Figure 3: DOWNLOAD Console as displayed in the RemoteDrive/Sunway.

Press the Refr. button to view the files contained in ES851 Data Logger board. Each file can be individually selected and deleted by pressing the Del. button.

The file download allows configuring the DL Tables, i.e. the files allowing ES851 Data Logger to recognize each connected device. The variables to be monitored and recorded for each device can be recognized as well. The extension for the configuration files is ".out". These files can be downloaded from the download section of Enertronica Santerno's website. To do so, point to the directory of the PC; all the available ".out" files are viewed on the left of the screen. Press the ">" button to download the selected files.

30. APPENDIX

The sections below include the tables containing the references of the variables monitored by the LOGGING.

CAUTION The tables related to the variables monitored by the LOGGING may vary depending on the type of device and its software version. Refer to santerno.com for the updates.

Updates or tables relating to new devices can be downloaded using the special function implemented in ES851 (Download Console function) that can be used with the RemoteDrive/Sunway (see the DOWNLOAD CONSOLE MENU). LOGGING is currently available for the following products: Sunway TG, Sunway M XR, Smart String Box, Penta Drive, Multipump Penta, Regenerative Penta, QS String Boxes, Sunway M Plus, Weather Station, Etesian Mini, Etesian One, Etesian D.

Formattato: Non Evidenziato

Formattato: Non Evidenziato

30.1. Sunway TG (ST)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M013	1504,1505	Energy Delivered to the Grid	SLOW Log
A1-FL01	7712	Last Alarm Tripped	SLOW Log
M10	1509	PV Field Voltage	FAST Log
M003	1498	Active Power Delivered	FAST Log
M007	1502	Grid Voltage	FAST Log
M024	1674	Module Radiation	FAST Log
M089	1494	Inverter Status	FAST Log

Extended Mode – Additional Parameters

Parameter	Modbus Address	Description	Type of Log
M000	1508	PV-Voltage Reference	SLOW Log
M19	1669	Grid KO Events	SLOW Log
M20	1670	Radiation KO Events	SLOW Log
M21	1671,1672	Delivery Time	FAST Log
M001	1497	Grid Frequency	FAST Log
M009	1503	Grid Current	FAST Log
M012	1511	PV Field Power	FAST Log
M025	1675	Ambient Measure 2	FAST Log
M026	1676	Ambient Measure 3	FAST Log
M027	1677	Ambient Measure 4	FAST Log

Event Parameters:

Trigger Par.	Modbus Address	Description
M0XX	3400	Alarm Tripped

Detected Parameter	Modbus Address	Description
FL01c	7717	Inverter Status
FL01s	7731	Active Power Delivered

30.2. Sunway M XR (SM)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M010	1661,1662	Energy Delivered to the Grid	SLOW Log
A1-FL01	7712	Last Alarm Tripped	SLOW Log
M000	1650	PV Field Voltage	FAST Log
M004	1654	Grid Voltage	FAST Log
M008	1658	Active Power Delivered	FAST Log
M050	1739	Inverter Status	FAST Log
M110	1564	Module Radiation	FAST Log

Extended Mode – Additional Parameters

Parameter	Modbus Address	Description	Type of Log
M015	1669	Grid KO Events	SLOW Log
M016	1670	Radiation KO Events	SLOW Log
M009	1659,1660	Delivery Time	SLOW Log
M002	1652	PV-Field Current	FAST Log
M005	1655	Grid Frequency	FAST Log
M006	1656	Grid Current	FAST Log
M111	1565	Horizontal Radiation	FAST Log
M112	1566	Ambient Temperature	FAST Log
M113	1567	Module Temperature	FAST Log
M114	1568	Ambient Measure	FAST Log

Event Parameters:

Trigger Par.	Modbus Address	Description
M0XX	3400	Alarm Tripped

Detected Parameter	Modbus Address	Description
FL01c	7717	Inverter Status
FL01v	7735	Active Power Delivered

30.3. Smart String Box (QF)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M009	1659	Average Current	FAST Log
M010	1660	Maximum Current	FAST Log
M011	1661	Minimum Current	FAST Log
M014	1664	Module Temperature	FAST Log
M020	1670	String Performance Status+ Board I/O	FAST Log

Extended Mode – Additional Parameters

Parameter	Modbus Address	Description	Type of Log
M001	1651	String 1 Current	FAST Log
M002	1652	String 2 Current	FAST Log
M003	1653	String 3 Current	FAST Log
M004	1654	String 4 Current	FAST Log
M005	1655	String 5 Current	FAST Log
M006	1656	String 6 Current	FAST Log
M007	1657	String 7 Current	FAST Log
M008	1658	String 8 Current	FAST Log
M015	1665	Ambient Temperature	FAST Log

Event Parameters:

Trigger Par.	Modbus Address	Description
M018	1668	Alarm Tripped/String Theft

Detected Parameter	Modbus Address	Description
M019	1669	Strings KO
M009	1659	Average Current

30.4. Penta Drive (PD)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M062	1712	Ambient Temperature	SLOW Log
M002	1652	Speed Ramp Output	FAST Log
M004	1654	Motor Speed	FAST Log
M006	1656	Output Frequency	FAST Log
M026	1676	Output Current	FAST Log
M027	1677	Output Voltage	FAST Log

Extended Mode – Additional Parameters

Parameter	Modbus Address	Description	Type of Log
M064	1714	IGBT Temperature	SLOW Log
M028	1678	Output Power	FAST Log
M031	1681	Delayed Digital Inputs	FAST Log
M056	1706	Digital Outputs	FAST Log
M089	1739	Drive Status	FAST Log
M090	1740	Alarm Tripped	FAST Log

30.5. Penta Multipump (PM)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M621	1951, 1952	Operating Time of Pump 1	SLOW Log
M623	1953, 1954	Operating Time of Pump 2	SLOW Log
M625	1955, 1956	Operating Time of Pump 3	SLOW Log
M627	1957, 1958	Operating Time of Pump 4	SLOW Log
M629	1959, 1960	Operating Time of Pump 5	SLOW Log
M600	1551	Available Pumps	FAST Log
M601	1552	Pumps On	FAST Log
M604	1555	Status of Serial Communications to Slave Devices	FAST Log
M605	1556	Multipump Operating Conditions	FAST Log
M006	1656	Output Frequency	FAST Log

Extended Mode – Additional Parameters

Parameter	Modbus Address	Description	Type of Log
M062	1712	Ambient Temperature	SLOW Log
M018	1668	PID Reference at Constant RPM	FAST Log
M022	1672	PID Output	FAST Log
M020	1670	PID Feedback	FAST Log
M026	1676	Output Current	FAST Log
M028	1678	Output Power	FAST Log
M031	1681	Delayed Digital Inputs	FAST Log
M056	1706	Delayed Digital Outputs	FAST Log
M089	1739	Drive Status	FAST Log
M090	1740	Alarm Tripped	FAST Log

30.6. Penta Regenerative (PR)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M562	1712	Ambient Temperature	SLOW Log
M564	1714	IGBT Temperature	SLOW Log
M501	1651	DC-Bus Voltage	FAST Log
M502	1652	Mains Voltage	FAST Log
M503	1653	Drive Current	FAST Log
M504	1654	Mains Frequency	FAST Log
M505	1655	Active Power Delivered	FAST Log
M506	1656	Reactive Power Delivered	FAST Log
M508	1658	Power Factor	FAST Log
M515	1665	PLL Status	FAST Log
M516	1666	Status of Mains 2	FAST Log
M517	1667	Status of Mains 1	FAST Log

Extended Mode – Additional Parameters

Parameter	Modbus Address	Description	Type of Log
M531	1681	Digital Inputs	FAST Log
M556	1706	Digital Outputs	FAST Log
M589	1739	Drive Status	FAST Log
M590	1740	Alarm Tripped	FAST Log

30.7. String Box (QS)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
Ist1	14	String 1 Current	SLOW Log
Ist1	14	String 1 Current	FAST Log
Ist2	15	String 2 Current	FAST Log
Ist3	16	String 3 Current	FAST Log
Ist4	17	String 4 Current	FAST Log

Extended Mode – Additional Parameters

Parameter	Modbus Address	Description	Type of Log
Ist5	18	String 5 Current	FAST Log
Ist6	19	String 6 Current	FAST Log
Ist7	20	String 7 Current	FAST Log
Ist8	21	String 8 Current	FAST Log

30.8. Sunway M PLUS (SP)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M010	1661,1662	Energy Delivered	SLOW Log
A1-FL01	7712	Last Alarm	SLOW Log
M000	1650	PV Field Voltage	FAST Log
M004	1654	Grid Voltage	FAST Log
M008	1658	Active Power Delivered	FAST Log
M089	1739	Inverter Status	FAST Log
M110	1688	Module Radiation	FAST Log

Extended Mode – Additional Parameters

Parameter	Modbus Address	Description	Type of Log
M097	1659,1660	Delivery Time	SLOW Log
M015	1669	Grid KO Events	SLOW Log
M016	1670	Radiation KO Events	SLOW Log
M002	1652	PV Field Current	FAST Log
M005	1655	Grid Frequency	FAST Log
M006	1656	Grid Current	FAST Log
M111	1689	Horizontal Radiation	FAST Log
M112	1690	Ambient Temperature	FAST Log
M113	1691	Module Temperature	FAST Log
M114	1692	Ambient Measurement	FAST Log

Events Parameters:

Trigger Par.	Modbus Address	Description
M0XX	3400	Current Alarm Image

Detected Parameter	Modbus Address	Description
FL01c	7717	Inverter Status
FL01v	7735	Active Power Delivered

30.9. Meteo Center (MZ)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M001	0,1	Ambient Temperature	FAST Log
M002	2,3	Module Temperature	FAST Log
M003	4,5	Module Radiation	FAST Log
M004	6,7	Wind Direction	FAST Log
M005	8,9	Wind Speed	FAST Log
M006	10,11	Battery Level	FAST Log
M007	12,13	Average Radiation	FAST Log
M008	14,15	Total Radiation	FAST Log
M009	16,17	Average Wind Direction	FAST Log
M010	18,19	Average Wind Speed	FAST Log

30.10. Etesian D – Motor Monitoring (WD)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M073	1723	Rotor RMS Current	SLOW Log
M064	1714	IGBT Temperature	SLOW Log
M091	1739	Inverter Status	FAST Log
M092	1740	Alarm Code	FAST Log
M015	1665	RS Grid Voltage (RMS)	FAST Log
M016	1666	ST Grid Voltage (RMS)	FAST Log
M019	1669	TR Grid Voltage (RMS)	FAST Log
M701	3361	PLL Alarm Codes	FAST Log
M702	3362	GRID KO Alarm Codes	FAST Log
M077	1727	Stator Active Power	FAST Log
M078	1728	Rotor Active Power	FAST Log
M012	1662	R-phase Stator Current (RMS)	FAST Log
M013	1663	S-phase Stator Current (RMS)	FAST Log
M014	1664	T-phase Stator Current (RMS)	FAST Log
C208	100	Validated Zero Mark	FAST Log
C209	101	Enc Error	FAST Log
C210	102	No. of Pulses Recovered	FAST Log

30.11. Etesian Mini (WM)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M000	1650	DC Bus Voltage	FAST Log
M001	1651	DC Bus Voltage Ref.	FAST Log
M100	1674	Input Voltage	FAST Log
M102	1676	Input Current	FAST Log
M008	1658	Active Power Delivered	FAST Log
M057	1707	CPU Temperature	FAST Log
M059	1709	Heatsink Temperature	FAST Log
M050	1739	Inverter Status	FAST Log

Event Parameters:

Trigger Par.	Modbus Address	Description
M0XX	3400	Current Alarm Image

Detected Parameter	Modbus Address	Description
FL01d	7718	Inverter Status
FL01I	7724	Active Power Delivered

30.12. Etesian One (WO)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M013	1504	Energy Delivered	SLOW Log
A1-FL01	7712	Last Alarm	SLOW Log
M097	1933,1934	Delivery Time	SLOW Log
M010	1509	Input Voltage	FAST Log
M003	1498	Active Power Delivered	FAST Log
M007	1502	Grid Voltage	FAST Log
M089	1739	Inverter Status	FAST Log
M062	1712	Ambient Temperature	FAST Log
M064	1714	Heatsink Temperature	FAST Log
M001	1497	Grid Frequency	FAST Log

Extended Mode – Additional Parameters

Parameter	Modbus Address	Description	Type of Log
M009	1503	Grid Current	FAST Log
M012	1511	Input Power	FAST Log
M028	1678	Wind Direction	FAST Log
M029	1679	Wind Speed	FAST Log

Event Parameters:

Trigger Par.	Modbus Address	Description
M0XX	3400	Current Alarm Image

Detected Parameter	Modbus Address	Description
FL01c	7717	Inverter Status
FL01s	7731	Active Power Delivered

30.13. Etesian D – Grid-side Inverter (WG)

Standard Mode

Parameter	Modbus Address	Description	Type of Log
M062	1712	Ambient Temperature	SLOW Log
M064	1714	IGBT Temperature	SLOW Log
M089	1739	Inverter Status	FAST Log
M090	1740	Alarm Code	FAST Log
M700	3219	PLL Status	FAST Log
M701	3220	PLL Alarm Codes	FAST Log
M702	3221	GRID KO PLL Alarms	FAST Log
M509	1659	R-S Grid Voltage (RMS)	FAST Log
M510	1660	S-T Grid Voltage (RMS)	FAST Log
M511	1661	T-R Grid Voltage (RMS)	FAST Log
M512	1662	R-phase Stator Current (RMS)	FAST Log
M513	1663	S-phase Stator Current (RMS)	FAST Log
M514	1664	T-phase Stator Current (RMS)	FAST Log
M501	1651	DC Bus Current	FAST Log
M502	1652	Grid Voltage	FAST Log
M503	1653	Inverter Current	FAST Log
M504	1654	Grid Frequency	FAST Log