1 Operating Parameters

NOTE for user on the online help

This chapter is integrated as an online help in the user interface.

The description of parameterization of the operating parameters can be found in the manual SICAM P850/P855, order number E50417-H1040-C482-A4.

1.1 Process Connections

The following process connections are available:

- AC Measurement
- Binary Outputs
- LEDs

1.1.1 AC Measurement

Parameter	Default Settings	Setting Range
Rated frequency	50 Hz	50 Hz (± 7.5 Hz) 60 Hz (± 9 Hz)
Network type	Four-wire, 3-phase, unbalanced	1-phase network Three-wire, 3-phase balanced Three-wire, 3-phase, unbalanced (2 * I) Three-wire, 3-phase, unbalanced (3 * I) Four-wire, 3-phase, balanced Four-wire, 3-phase, unbalanced
Primary nominal voltage	AC 400.00 V	AC 1 V to AC 1 000 000 V, dependent on the setting range in the selected network type
Voltage transformer	no	yes no
At voltage transformer: yes		
Primary rated voltage	AC 400.00 V	AC 100.00 V to 1 000 000.00 V
Secondary rated voltage	AC 400.00 V	AC 1.0 V to 1000.0 V
Voltage measurement range	ph-N: AC 400 V (inject a maximum of AC 347 V for UL), ph-ph: AC 690 V (inject a maximum of AC 600 V for UL)	ph-N: AC 63.5 V, ph-ph: AC 110 V ph-N: AC 110 V, ph-ph: AC 190 V ph-N: AC 230 V, ph-ph: AC 400 V ph-N: AC 400 V (max. 347 V for UL) ph-ph: AC 690 V (max. 600 V for UL)
Current measurement range [1)]	AC 5 A	AC 1 A AC 5 A
Current transformer	no	yes no
At current transformer: yes		
Primary rated current	AC 1000.00 A	AC 1.00 A to 100 000.00 A
Secondary rated current	AC 1.00 A	AC 0.01 A to 10.00 A
Zero point suppression	0.3 % (from Vrated, Irated)	0.0 % to 10.0 %
Voltage harmonic unit	%	% V

1) Recalibration must be done if current measurement range is changed.

1.1.2 Binary Outputs

Parameter	Default Settings	Setting Range
Source type	Indication	Indication Energy counter
Indication (only if source type = indication)	-none-	-none- Device OK Battery Failure Settings Load Settings Check Settings Activate Modbus TCP OK Ethernet Link Error Modbus Serial OK Time Synchronization Error Primary NTP Server Error Secondary NTP Server Error Daylight Saving Time Default IP Address IEC 60870-5-103 OK Limit Violation y (y = 1 to 16) Indication 1 from Remote Indication 2 from Remote Rotation Field Clockwise Group Indication x (x = 1 to 4) IEC 61850 Communication OK SD Card Error Voltage Event Available Frequency Event Available Volt. Unbalance Event Available
Energy counter (only if source type = energy counter)	-none-	WPa_sup WPb_sup WPc_sup WP_sup WPa_dmd WPb_dmd WPc_dmd WP_dmd WQa_ind WQb_ind WQc_ind WQ_ind WQa_cap WQb_cap WQc_cap WQ_cap WSa WSb WSc WS
Source inverted (only if source type = indication)	no	no yes

Parameter	Default Settings	Setting Range
Operating mode (only if source type = indication)	Persistent	Persistent Persistent with fail safe Pulse Pulse with retrigger
Energy increase per pulse (only if source type = energy counter)	1.0 Wh	0.1 Wh/VAh/varh to 1 000 000 Wh/VAh/varh
Output time pulse operating mode (only if source type = indication and pulse output or pulse output with retrigger or if source type = energy meter)	20 * 10 ms = 200 ms	50 ms to 3 600 000 ms

1.1.3 LEDs

LED	Default Setting	Setting Range
RUN	Device ready	Not settable
ERROR	-none-	-none- Battery Failure Ethernet Link Error Time Synchronization Error Primary NTP Server Error Secondary NTP Server Error SD Card Error
H1 H2	-none-	-none- Device OK Battery Failure Settings Load Settings Check Settings Activate Modbus TCP OK Ethernet Link Error Modbus Serial OK Time Synchronization Error Primary NTP Server Error Secondary NTP Server Error Daylight Saving Time Default IP Address IEC 60870-5-103 OK Limit Violation y (y = 1 to 16) Indication 1 from Remote Indication 2 from Remote Rotating Field Clockwise Group Indication x (x = 1 to 4) IEC 61850 Communication OK SD Card Error Voltage Event Available Frequency Event Available Volt. Unbalance Event Available
Indication inverted	no	no yes

1.2 Automation Functions

The following automation functions are available:

- Limit violation 1-8
- Limit violation 9-16
- Group indication 1-4

1.2.1 Limit Violation 1-8 and 9-16

Parameter	Default Setting	Setting Range
Measurand	-none-	-none- Va, Vb, Vc Vab, Vbc, Vca Ia, Ib, Ic VN, Vavg IN, Iavg Pa, Pb, Pc, P Qa, Qb, Qc, Q Sa, Sb, Sc, S cos φ (a), cos φ (b), cos φ (c), cos φ PFa, PFb, PFc, PF φUIa, φUIb, φUIc, φUI f Vunbal Iunbal THDS Va, THDS Vb, THDS Vc THDS Ia, THDS Ib, THDS Ic φab V, φca V φab I, φca I Q1a, Q1b, Q1c; Q1 Pinst (a-n), Pinst (b-n),Pinst (c-n) Pst (a-n), Pst (b-n),Pst (c-n) Plt (a-n), Plt (b-n),Plt (c-n) Pinst (a-b), Pinst (b-c),Pinst (c-a) Pst (a-b), Pst (b-c),Pst (c-a) Plt (a-b), Plt (b-c),Plt (c-a) (Setting ranges pending from network type and device type)
Limit	0.00	-1 000 000 000 to 1 000 000 000 (unit)
Limit type	Lower	Lower Upper
Hysteresis (%)	1.0	0.0 to 10.0
Violation indication	Limit Violation x (x = 1 to 16)	The name of the limiting value indication is customizable.

1.2.2 Group Indications 1-4

Parameter	Default Setting	Setting Range
Source	-none-	-none- Device OK Battery Failure Settings Load Settings Check Settings Activate Modbus TCP OK Ethernet Link Error Modbus Serial OK Time Synchronization Error Primary NTP Server Error Secondary NTP Server Error Daylight Saving Time Default IP Address IEC 60870-5-103 OK Limit Violation y (y = 1 to 16) Indication 1 from Remote Indication 2 from Remote Rotation Field Clockwise Group Indication x (x = 1 to 4) IEC 61850 Communication OK SD Card Error Voltage Event Available Frequency Event Available Volt. Unbalance Event Available
Source inverted	no	no yes
Logic operation	NONE	NONE OR AND
Group indication name	Group Indication x	Any

1.3 HMI

1.3.1 Display Settings

Parameter	Default Setting	Setting Range
Contrast	8	0 to 10
Time until dimmed	10	1 min to 99 min
Refresh time	1000	330 ms to 3000 ms
Inverse display	no	no yes
Phase label	(L1,L2,L3)	(L1,L2,L3) (a,b,c)
Use password	yes	no yes

1.3.2 User Defined Screen

Parameter	Default Setting	Setting Range
Screen type	-none-	-none- 2 measured values, numerical 4 measured values, numerical 2 measured values, graphical + numerical 3 measured values, graphical + numerical
Screen name	USER_SCREEN_x (x = 1 to 4)	any
2 measured values, numerical Display 1, numerical Display 2, numerical	-none-	-none- Va, Vb, Vc Vab, Vbc, Vca Ia, Ib, Ic VN, Vavg IN, Iavg Pa, Pb, Pc, P Qa, Qb, Qc, Q Sa, Sb, Sc, S cos φ (a), cos φ (b), cos φ (c), cos φ PFa, PFb, PFc, PF φUIa, φUIb, φUIc, φUI f Vunbal Iunbal THDS Va, THDS Vb, THDS Vc THDS Ia, THDS Ib, THDS Ic φab V, φca V φab I, φca I Q1a, Q1b, Q1c; Q1 Pinst (a-n), Pinst (b-n), Pinst (c-n) Pst (a-n), Pst (b-n),Pst (c-n) Plt (a-n), Plt (b-n), Plt (c-n) Pinst (a-b), Pinst (b-c), Pinst (c-a) Pst (a-b), Pst (b-c), Pst (c-a) Plt (a-b), Plt (b-c), Plt (c-a) WPa_sup, WPb_sup, WPc_sup, WP_sup WPa_dmd, WPb_dmd, WPc_dmd, WP_dmd WQa_ind, WQb_ind, WQc_ind, WQ_ind WQa_cap, WQb_cap, WQc_cap, WQ_cap WSa, WSb, WSc, WS (Setting ranges pending from network type and device type)
4 measured values, numerical Display 1, numerical Display 2, numerical Display 3, numerical Display 4, numerical	-none-	
2 measured values, graphical and numerical Display 1, graph./num. Display 2, graph./num.	-none-	
3 measured values, graphical and numerical Display 1, graph./num. Display 2, graph./num. Display 3, graph./num.	-none-	
Display x, graph./num. (x = 1 to 3) Min value Max value	1.0 10.0 (unit according to measured value)	The minimum and maximum value is defined by the selected parameters (see chapter 7.3.3.1.1).

1.4 Recording and Reporting

1.4.1 Event Recorders

Parameter	Default Setting	Setting Range
Supply Voltage		
Swell threshold	110 %	105 % to 140 % in 5-% steps
Dip threshold	90 %	75 % to 95 % in 5-% steps
Interruption threshold	5 %	1 %, 2 %, 3 %, 5 %, 8 % 10 %
Event hysteresis	2 %	1 % to 6 % in 1-% steps
Frequency		
Underfrequency threshold	1 %	0.1 % to 0.9 % in 0.1-% steps 1 % to 5 % in 1-% steps
Overfrequency threshold	1 %	0.1 % to 0.9 % in 0.1-% steps 1 % to 5 % in 1-% steps
Unbalance		
Voltage unbalance threshold	5 %	1 % to 5 % in 1-% steps

1.4.2 Trigger Management

Parameter	Default Setting	Setting Range
Voltage trigger limits		
Trigger active	no	no yes
Tolerance unit	Percentage	Percentage Numerical
Lower threshold	90.00 % of the of the primary nominal voltage	0.00 % to 99.99 % of the of the primary nominal voltage 0.0 V to 1 000 000.0 V
Upper threshold	110.00 % of the of the primary nominal voltage	100.0 % to 10 000.0 % of the primary nominal voltage 0.0 V to 1 000 000.0 V

Hysteresis	2.00 % of the of the primary nominal voltage	0.0 % to 50.0 % of the of the primary nominal voltage
Current trigger limits		
Trigger active	no	no yes
Tolerance unit	Percentage	Percentage Numerical
Lower threshold	90.00 % of nominal current In	0.00 % to 99.99 % of of nominal current In 0.0 A to 1 000 000.0 A
Upper threshold	110.00 % of nominal current In	100.0 % to 10 000.0 % of of nominal current In 0.0 A to 1 000 000 A
Hysteresis	2.00 % of nominal current In	0.0 % to 50.0 % of of nominal current In
Waveform capture setting		
Total recording duration	2.0 s	0.2 s to 3.0 s in 0.2-s steps
Pretrigger ratio	10 %	0 % to 30 % in 5-% steps
Record ph-ph voltage	no	no yes

1.4.3 Recorder Management

SICAM P850

Parameter	Default Setting	Setting Range	
Measurement Recorder			
Average intervals - Frequency	10 s	fixed	
Average interval - Voltage / Unbalance / Harmonics	10 min	30 s, 1 min, 10 min, 15 min, 30 min, 1 h, 2 h	
Record additional data (I, P, Q, S etc.)	no	no yes	
Recorder of average - Min	no	no yes	
Recorder of average - Max	no	no yes	
Harmonics parity	Odd	Even Odd All	
File generation every: (corresponds to the setting of the *Average interval* parameter)	24 h	File generation every:	At average interval
		1 h	30 s
		2 h	1 min
		2 h	10 min, 15 min, 30 min, 1 h or 2 h
		4 h	
		6 h	
		12 h	
		24 h	
Recorded file type	CSV	CSV	

SICAM P855

Parameter	Default Setting	Setting Range
Measurement Recorder		
Average intervals - Frequency	10 s	fixed
Short term flicker	10 min	fixed
Long term flicker	2 h	fixed
Average interval - Voltage / Unbalance / Harmonics	10 min	30 s, 1 min, 10 min, 15 min, 30 min, 1 h, 2 h
Record additional data (I, P, Q, S etc.)	no	no yes

Recorder of average - Min	no	no yes	
Recorder of average - Max	no	no yes	
Harmonics parity	Odd	Even Odd All	
File generation every: (corresponds to the setting of the *Average interval* parameter)	24 h	File generation every:	At average interval
		1 h	30 s
		2 h	1 min
		2 h	10 min, 15 min, 30 min, 1 h or 2 h
		4 h	
		6 h	
		12 h	
		24 h	
Recorded file type	PQDIF	PQDIF CSV All	
Flicker lamp model	230 V	230 V 120 V	
Trend Recorder			
Tolerance unit	Percentage	Percentage Numerical	
Tolerance number	Percentage: 3 % of declared input voltage Udin, Numerical: 0.50 V	1 % to 5 % in 1 % steps 0.20 V to 500.0 V	
Maximum recording interval	10 min	10 min, 30 min, 1 h, 2 h, 4 h, 6 h, 12 h, 24 h [1)]	

1) The trend recorder also creates a PQDIF file when 1024 data points have been generated within the recording interval.

1.4.4 Memory Management

SICAM P850

Parameter	Default Setting	Setting Range
Splitting		
Measurement recorder	85.0 % (the recording time depends on the aggregation interval)	60 % to 90 % [1]
Fault recorder	15.0 % (residual storage capacity)	10 % to 40 % [2]

1) The memory sizes for measurement recorder can be changed.

2) If the rest storage capacity fall below 10 %, it will mark as red color on User Interface, then the activation is not possible.

SICAM P855

Parameter	Default Setting	Setting Range
Splitting		
Event recorder	1.0 %	1 % to 33 % [1]
Measurement recorder	35.0 % (the recording time depends on the aggregation interval)	33 % to 65 % [1]
Trend recorder	61.0 % (residual storage capacity)	31 % to 63 % [2] [3]
Fault recorder	3.0 % (Numbers of records depends on the fault record time.)	3 % to 35 % [1]

1) The memory sizes for event list, PQ records and fault records can be changed.

2) The memory size for continuous recording is calculated automatically and forms the difference to 100 % of the total memory size. The maximum total memory size of 100 % cannot be exceeded due to parameterization errors.

3) If the residual storage capacity falls below 31 %, then the activation is not possible. In this case appear the report was not successfully action in the status line.

1.4.5 Report Configuration

Parameter	Default Setting	Setting Range
General Information		
Company: Department: Supervisor: Inspector: Location: Comment:	-	Any text displayed in the print-out of the power quality report
Power Quality Report		
Evaluation mode according to:	EN 50160 LV&MV	EN 50160 LV&MV EN 50160 HV User defined
Flagging acc. to IEC 61000-4-30	no	no yes
Power frequency: 99.5 % of measurand should be in -1.0 % to 1.0 % deviation of the power frequency. 100 % of measurand should be in -6.0 % to 4.0 % deviation of the power frequency.		Any setting for user-defined evaluation mode
Power supply voltage magnitude: 95 % of measurand should be in -10.0 % to 10.0 % deviation of the clared input voltage Udin. 100 % of measurand should be in -15.0 % to 10.0 % deviation of the clared input voltage Udin.		Any setting for user-defined evaluation mode
Voltage unbalance: [1)] 95 % of measurand should be less than 2.0 %. 100 % of measurand should be less than 3.0 %.		Any setting for user-defined evaluation mode
Subgroup Total Harmonic Distortion (THDS): 95 % of measurand should be less than 8.0 %.		Any setting for user-defined evaluation mode
Supply voltage interruptions: 1. Short interruption until 1 second duration 2. Short interruption until 3 minute duration 3. Long interruption longer than 3 minute duration		Any setting for user-defined evaluation mode
Harmonic voltages: Even harmonics Odd harmonics: multiples of 3 Odd harmonics: not multiples of 3		Any setting for user-defined evaluation mode

1) According to EN 50160, up to 3 % unbalance can occur in 3-wire networks in areas with many 1-wire and 2-wire connections.

1.4.6 Recording Control

Parameter	Default Setting	Setting Range
Start record option	Start next 10th minute	Start next minute Start next 10th minute Start immediately Start next hour Start next day
Start time	-	Display of the start time in: Depends on the configuration of Date/time format.
Recording status	-	Not settable Status display of recorder started or recorder stopped

1.5 Administrative

The following administrative settings are available:

- Time Synchronization
- Ethernet Communication
- Communication Serial
- Communication SerialDevice and Language

1.5.1 Time Synchronization

Parameter	Default Settings	Setting Range
Source time synchronization	Internal	Internal Ethernet NTP Fieldbus
Time zone offset to UTC	+00:00	-12 to +13 (hours) (in increments of 0.5 h)
Daylight Saving Time switchover	yes	no yes
DST offset to UTC	+01:00	0 to + 2 (hours) (in increments of 0.5 h)
Start of DST	March Last week Sunday 02:00 AM	January to December First week Second week Third week Fourth week Last week Sunday to Saturday 0:00 to 23:00 (full hour)
End of DST	October Last week Sunday 03:00 AM	January to December First week Second week Third week Fourth week Last week Sunday to Saturday 0:00 to 23:00 (full hour)
Additional Parameters if the Source is Ethernet NTP		
Primary NTP server IP Address	192.168.0.254	Any
Secondary NTP server IP Address	192.168.0.253	Any No polling of the NTP server if 0.0.0.0 was entered
Error indication after	10 min	2 min to 120 min
Additional Parameters if Source is Fieldbus		
Error indication after	10 min	2 min to 120 min

1.5.2 Ethernet Communication

Parameter	Default Settings	Setting Range
IP Address [1]	192.168.0.55	Any 0.0.0.0 = DHCP
Subnet mask [1]	255.255.255.0	Any
Default gateway [1]	192.168.0.1	Any
Enable SNMP	no	no yes
Bus protocol	Modbus TCP	Modbus TCP IEC 61850 -none-
Bus Protocol Modbus TCP		
Use a user-port number [2]	no	no yes
User-port number [2] (can only be set when *Use a user-port number* is parameterized with *yes*)	10000	10000 to 65535
Access rights for user port (can only be set when *Use a user-port number* is parameterized with *yes*)	Full	Full Read only
Access rights for user port 502	Full	Full Read only
Keep Alive time	10 s	0 s = switch off 1 s to 65 535 s
Communication supervision time	600 * 100 ms	0 s = none 100 ms to 6 553 400 ms
Bus Protocol IEC 61850		
IED name	SICAM_P85x_01	max. 13 characters
Voltage - Deadband	0.2 %	0.2%, 0.5%, 1 % to 5 %, in 1-% steps
Current - Deadband	5 %	1 % to 5 %, in 1-% steps
Power - Deadband	0.5 %	0.5%, 1 % to 5 %, in 1-% steps
Power factor - Deadband	5 %	2 % to 5 %, in 1-% steps
Frequency - Deadband	0.05 %	0.02 % 0.05 %

[1] After the parameter changes have been enabled, the device resets.

[2] After enabling the parameter changes, any currently active Modbus TCP connections will be closed. The Modbus TCP client must later re-open these connections.

1.5.3 Communication Serial

Parameter	Default Setting	Setting Range
Bus protocol	Modbus RTU	-none- Modbus RTU IEC 60870-5-103
Bus Protocol Modbus RTU		
Device address	1	1 to 247
Baud rate	19 200 bit/s	1200 bit/s, 2400 bit/s 4800 bit/s, 9600 bit/s 19 200 bit/s, 38 400 bit/s 57 600 bit/s, 115 200 bit/s
Parity	Even	None, 1 stop bit Even Odd None, 2 stop bit
Access rights	Full	Full Read only
Communication supervision time	600 * 100 ms	0 s = none 100 ms to 6 553 400 ms
Bus Protocol IEC 60870-5-103		
Device address	1	1 to 254
Baud rate	9600 bit/s	9600 bit/s 19 200 bit/s 38 400 bit/s
Measured value range	120 % corresponds to a measured value range from -4096 to +4095 (-120 % to +120 %)	120 % 240 % corresponds to a measured value range from -4096 to +4095 (-120 % to +120 % or -240 % to +240 %)
Transmit energy	no	yes (every minute) no
Transmit HVa Mag.(Fundamental, 3rd, 5th,...,39th)	no	no yes
Transmit HVa Mag.(2nd, 4rd, 6th,...,40th)	no	no yes
Transmit HVb Mag.(Fundamental, 3rd, 5th,...,39th)	no	no yes

Parameter	Default Setting	Setting Range
Transmit HVb Mag.(2nd, 4rd, 6th,...,40th)	no	no yes
Transmit HVc Mag.(Fundamental, 3rd, 5th,...,39th)	no	no yes
Transmit HVc Mag.(2nd, 4rd, 6th,...,40th)	no	no yes
Transmit HIa Mag.(Fundamental, 2nd, 3rd,...,21st)	no	no yes
Transmit HIb Mag.(Fundamental, 2nd, 3rd,...,21st)	no	no yes
Transmit HIc Mag.(Fundamental, 2nd, 3rd,...,21st)	no	no yes
Transmit HIa Mag.(22nd, 23rd, 24th,...,40th)	no	no yes
Transmit HIb Mag.(22nd, 23rd, 24th,...,40th)	no	no yes
Transmit HIc Mag.(22nd, 23rd, 24th,...,40th)	no	no yes
Cyclic sending period	50 * 100 ms	30 * 100 ms to 600 * 100 ms
Communication supervision time	600 * 100 ms	0 s = none 100 ms to 6 553 400 ms

NOTE

For the serial communication via IEC 60870-5-103, the parity is permanently set to **even.**

1.5.3.1 Device and Language

Parameter	Default Settings	Setting Range
Device name	SICAM P850	Any Max. 32 characters
Language	ENGLISH (US)	ENGLISH (US) DEUTSCH (DE)
Date/time format	YYYY-MM-DD, Time with 24 hours	YYYY-MM-DD, Time with 24 hours YYYY-MM-DD, Time with 12 h AM/PM DD-MM-YYYY, Time with 24 hours DD-MM-YYYY, Time with 12 h AM/PM MM/DD/YYYY, Time with 24 hours MM/DD/YYYY, Time with 12 h AM/PM
Activation password	000000	Any 6 to 14 characters
Maintenance password	311299	Any 6 to 14 characters

Readme-OSS

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