

AccuSine SWP

20–480 A

Operation

Active Harmonic Filter

02/2015



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Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this publication.

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Important Safety Information

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

⚠ DANGER
DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury .
Failure to follow these instructions will result in death or serious injury.

⚠ WARNING
WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury .
Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION
CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury .
Failure to follow these instructions can result in injury or equipment damage.

NOTICE
NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.
Failure to follow these instructions can result in equipment damage.

Please Note

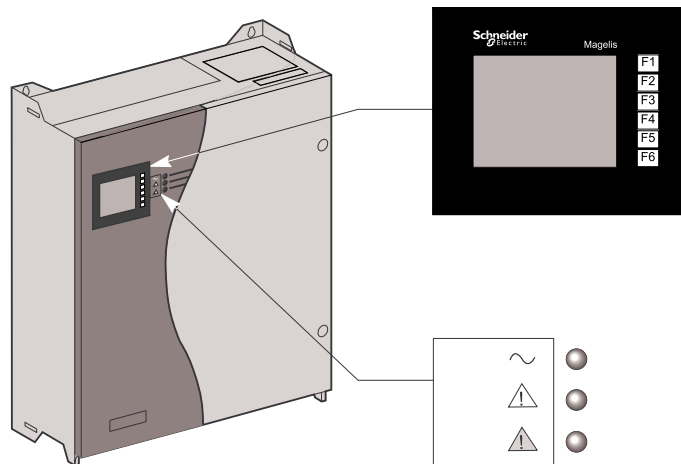
Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Overview

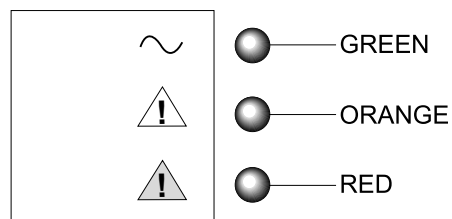
Display Interface

If the AccuSine SWP active harmonic filters are connected in parallel, each active harmonic filter can be started or shut down independently of the others.



Status LEDs

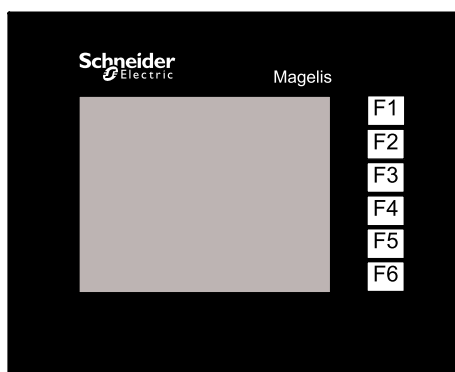
The operating state of the active harmonic filter is shown by the status LEDs.



Green LED lit.	Normal operation. The active harmonic filter is conditioning harmonics on mains.
Orange LED is flashing and green LED is lit. The orange LED will flash whether the active harmonic filter is running or stopped.	<p>Current-limiting operation.</p> <p>The harmonic RMS current absorbed by the load exceeds the active harmonic filter nominal current.</p> <ul style="list-style-type: none"> The active harmonic filter limits its compensating current to its nominal current rating. The load is not entirely compensated. The harmonic current difference (load harmonic I – compensating I) remains on mains. See <i>Troubleshooting</i>, page 24.
Red LED lit.	The active harmonic filter has stopped due to a manual STOP command or an operating anomaly. Consult the display to determine the status and to define the action required to correct the anomaly.

Display

Front view of display

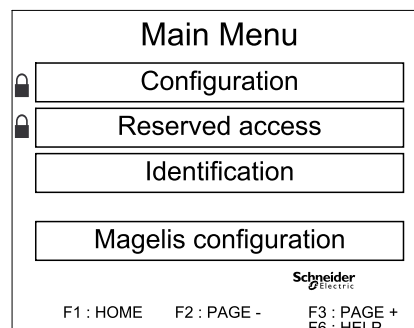
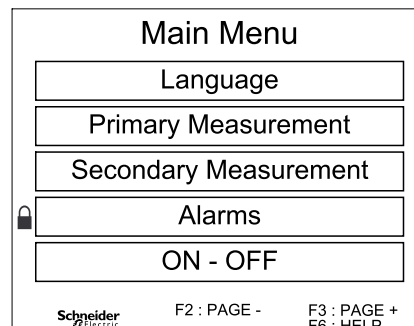


Display keys	Function
F1	Return to Main Menu
F2	Return to previous page
F3	Go to next page
F4	N/A
F5	N/A
F6	Go to help page

Main Menu

The first **Main Menu** screen is automatically displayed when the equipment is energized.

NOTE: The **Alarms**, **Configuration**, and **Reserved Access** menus are password protected and for Schneider Electric personnel only.



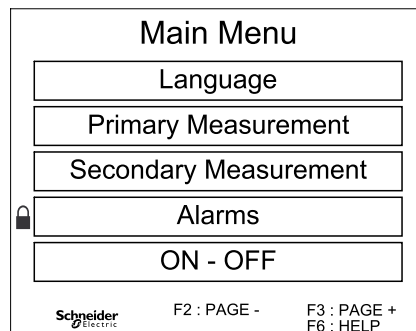
Configuration

The following parameters can be set. Work with your field service engineer to configure these parameters during initial start-up.

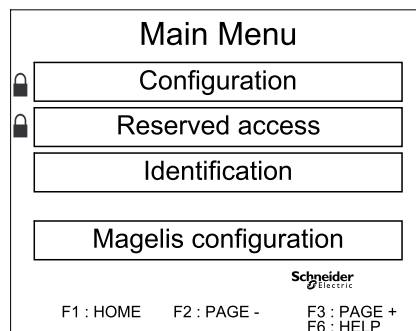
Parameter	Description	Possible settings	Factory setting
Sensor rating	Choose the rating of the current sensors used to measure the load currents.	300/1, 500/1, 600/1, 1000/1, 1500/1, 2000/1, 3000/1, 4000/1, 5000/1, 6000/1	300/1
Reactive compensation	Compensation or no compensation of the reactive energy. Reactive energy compensation is carried out to the detriment of harmonic compensation and it is therefore necessary to oversize the active harmonic filter if it is required to compensate both reactive energy and harmonics.	00 (not compensated) 01 (inductive) 02 (capacitive) 03 (inductive – capacitive)	00
With/without distributed neutral	Mains with or without distributed neutral.	00 (not distributed), 01 (distributed)	00
Choice of compensated harmonic orders	If this option is selected to optimize the active harmonic filter performance, the harmonic orders can be chosen.	0 (unfiltered), 1 (filtered)	1
Application type	Factory-set. It is defined in relation to the specific configuration.	0, 32 to 38, 64 to 70, 96 to 102	32
Number of devices in parallel	Choose the number of parallel-connected units.	From 1 (single unit) to x	1
Current sensor connected	Choose if the current sensor is connected.	0 (not connected), 1 (connected)	1
On / Off distance	Authorization or non authorization of remote RUN and STOP commands via the JBUS communication port.	00 (On), 01 (Off)	00
Startup delay	Choose the startup delay in seconds.	From 0 (no delay) to 9000.	0
Mains reference voltage	Load supply voltage.	From 99V to 901V	400V
Derating	Depending on altitude.	From 0% (no derating) to xx%.	10 %
Speed bauds for JBUS	In bauds per second.	0 (1200 bds) 1 (2400 bds) 2 (4800 bds) 3 (9600 bds)	3 (9600 bds)
JBUS mode	JBUS modes.	Modes can be: 0 (no parity, 1 stop bit) 1 (no parity, 2 stop bits) 2 (even parity, 1 stop bit) 3 (odd parity, 1 stop bit)	0 (Slave adress : 1)

Set Date and Time

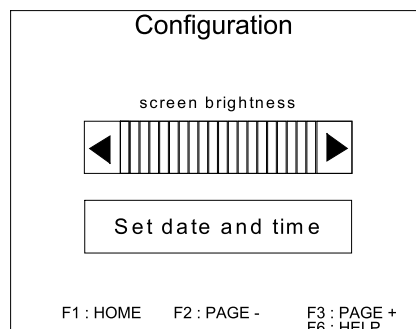
1. From the **Main Menu**, press **F3**.



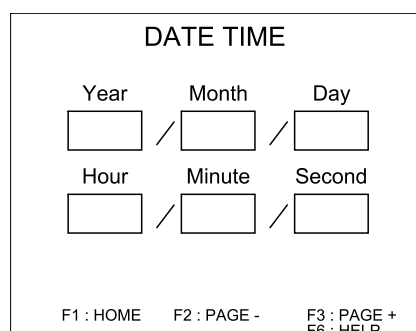
2. Tap **Magelis configuration**.



3. Tap **Set date and time**.

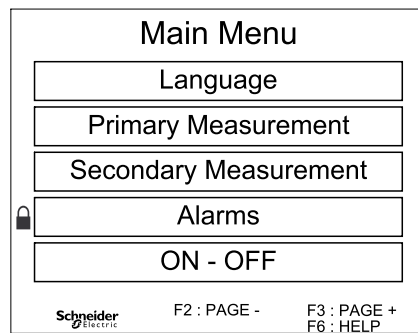


4. Tap the frames and set the values.

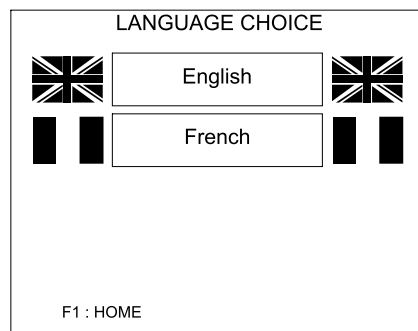


Select Language

1. From the **Main Menu**, tap **Language**.

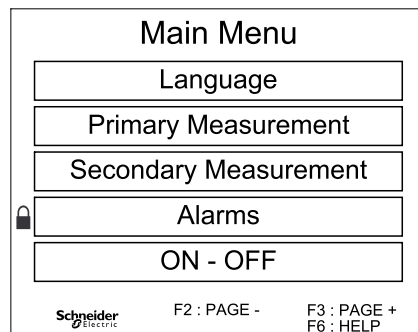


2. Tap chosen language.

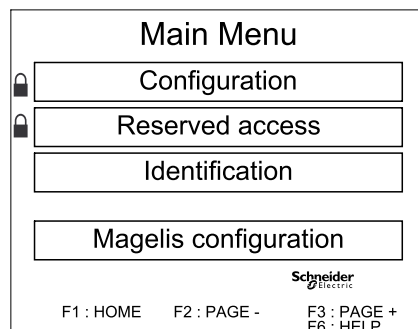


Set Brightness

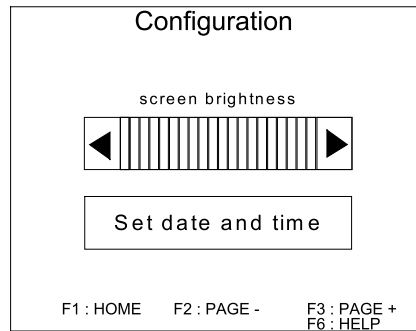
1. From the **Main Menu**, press **F3**.



2. Tap **Magelis configuration**.

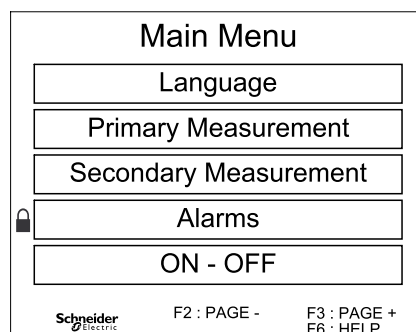


3. Tap the arrow frames and set the screen brightness.

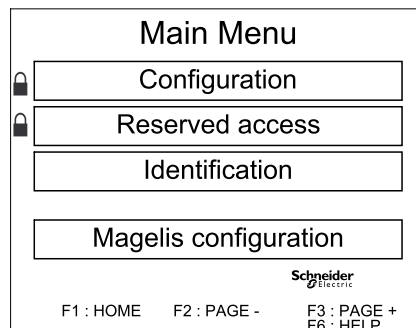


Set Screensaver

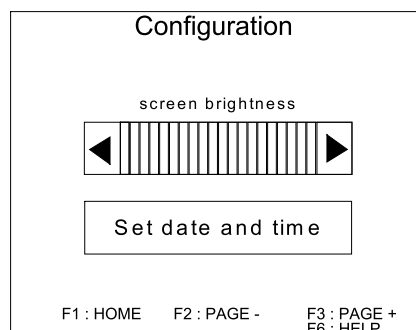
1. From the **Main Menu**, press **F3**.



2. Tap **Magelis configuration**.

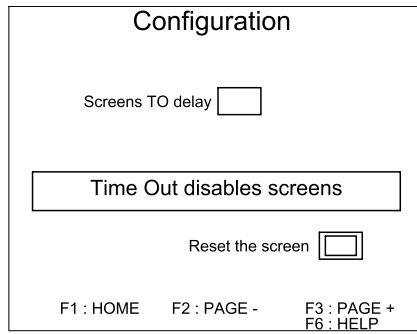


3. Press **F3**.



4. Tap **Screens TO delay** to set the value (in seconds from 1 to 3600).

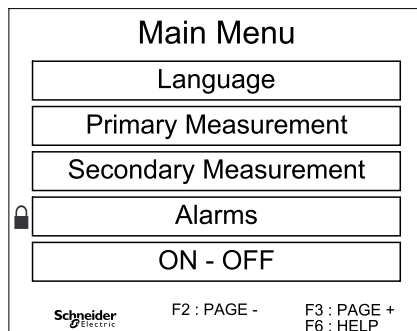
5. Tap **Time Out** disables screens.



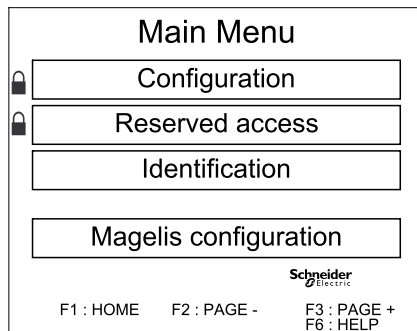
Reset Screen

NOTE: This operation will set all parameters to factory settings.

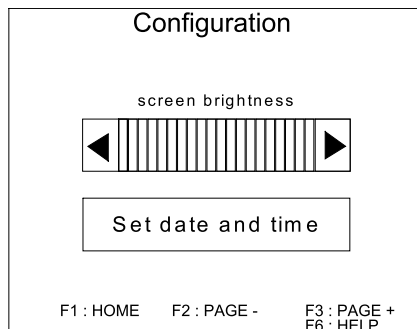
1. From the **Main Menu**, press **F3**.



2. Tap **Magelis configuration**.



3. Press **F3**.



4. Tap **Reset the screen.**

Configuration

Screens TO delay

Time Out disables screens

Reset the screen

F1 : HOME F2 : PAGE - F3 : PAGE +
F6 : HELP

Operation

Operation Procedures

Energize the Active Harmonic Filter

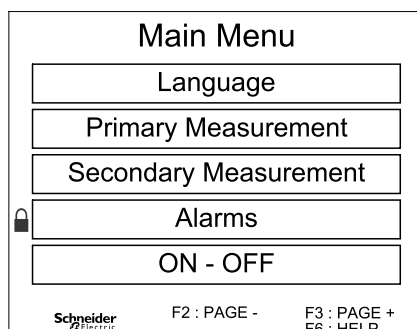
NOTE: The active harmonic filter must be energized for the first time by qualified Schneider Electric personnel who will carry out the necessary checks.

1. Close the active harmonic filter supply circuit breaker on your low voltage supply switchboard.
 - The active harmonic filter red LED lights up.
 - The display lights up.
 - After several seconds, the **Main Menu** is shown on the display.

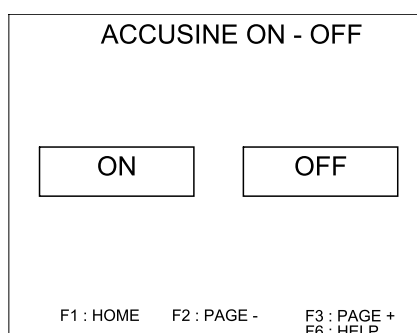
The active harmonic filter can be de-energized in any state by opening the supply circuit breaker.

Start the Active Harmonic Filter

1. From the **Main Menu**, tap **ON – OFF**.



2. Tap **ON**.

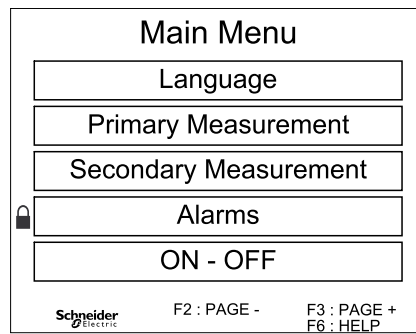


The active harmonic filter starts up and is then operational. The red LED goes off and the green LED lights up.

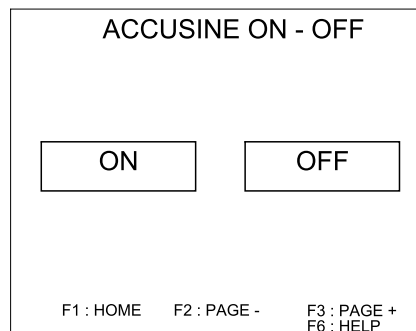
NOTE: The active harmonic filter will be automatically restarted when energized if the mains voltage disappears during operation. If the active harmonic filter is not energized and the mains voltage disappears, the active harmonic filter will remain stopped.

Stop the Active Harmonic Filter

1. From the **Main Menu**, tap **ON – OFF**.



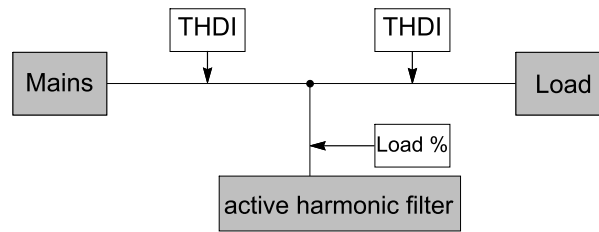
2. Tap **OFF**.



The active harmonic filter stops and no longer carries out compensation. The green LED goes off and the red LED lights up.

Access the Primary Measurements

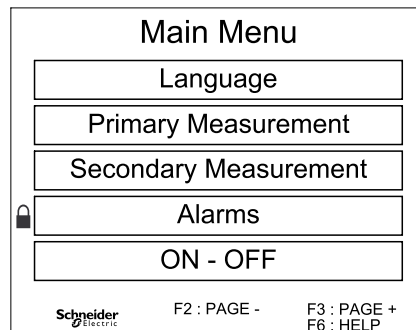
Measurement Points



NOTE: The current measurements in the neutral are not displayed in installations without distributed neutral.

NOTE: Insignificant measurements are replaced by * characters on the display and measurements where the capacity is exceeded are displayed with # characters on the display.

1. From the **Main Menu**, tap **Primary Measurement**.



2. Tap **F3** to display the different measurement screens:

MAINS		LOAD	
	rms		
I1	<input type="text"/> A	I1	<input type="text"/> A
I2	<input type="text"/> A	I2	<input type="text"/> A
I3	<input type="text"/> A	I3	<input type="text"/> A
IN	<input type="text"/> A	IN	<input type="text"/> A
F1 : HOME F2 : PAGE - F3 : PAGE +			

Actual RMS values shown in amps of the three phases and neutral of the mains current and the current absorbed by the non-linear load.

MAINS		LOAD	
overall rate distortion current absorbed by the load			
THDI1	<input type="text"/> %	THDI1	<input type="text"/> %
THDI2	<input type="text"/> %	THDI2	<input type="text"/> %
THDI3	<input type="text"/> %	THDI3	<input type="text"/> %
Ures		<input type="text"/>	
F1 : HOME F2 : PAGE - F3 : PAGE +			

Distortion rates of the three phases (THDI = I-harmonic/I-basic) of the mains current and the current absorbed by the non-linear load.

Ures: average value of the three mains phase-to-phase voltages.

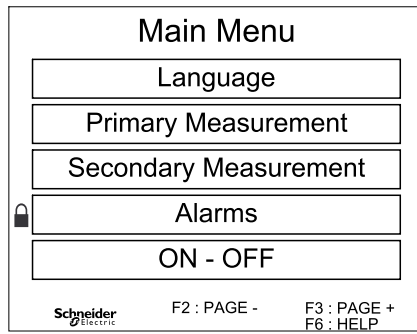
LOAD LEVEL - Accus.	
Accusine load level	
I1 / In	<input type="text"/> %
I2 / In	<input type="text"/> %
I3 / In	<input type="text"/> %
F1 : HOME F2 : PAGE - F3 : PAGE + F6 : HELP	

AccuSine load level on each of the phases.

- I1: RMS current supplied by the active harmonic filter on phase 1
- In: nominal RMS current

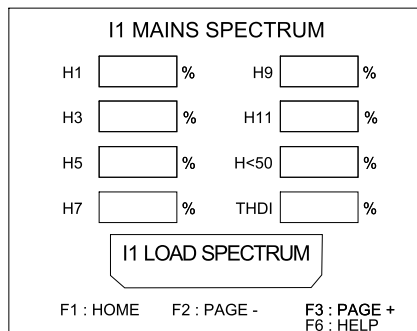
Access the Secondary Measurements

- From the **Main Menu**, tap **Secondary Measurement**.

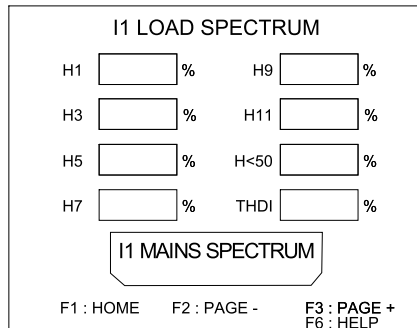


- H1, H3 – H<50: detailed spectrum of the first harmonic orders.
- THDI: total harmonic distortion rate of the current absorbed by mains.

- Tap **F3** to display phase 2 and phase 3 currents.



- Tap **I1 LOAD SPECTRUM**.



- H1, H3 – H<50: detailed spectrum of the first harmonic orders.
- THDI: total harmonic distortion rate of the current absorbed by the load.

- Tap **F3** to display phase 2 and phase 3 currents.

View Identification

1. From the **Main Menu**, press **F3**.

Main Menu

Language

Primary Measurement

Secondary Measurement

Alarms

ON - OFF

Schneider Electric F2 : PAGE - F3 : PAGE +
F6 : HELP

2. Tap **Identification**

Main Menu

Configuration

Reserved access

Identification

Magelis configuration

Schneider Electric

F1 : HOME F2 : PAGE - F3 : PAGE +
F6 : HELP

IDENTIFICATION

serial number

H3 A Un V Fn Hz
without neutral

commercial rating A

Index

SOFTWARE DSP

F1 : HOME F6 : HELP

This screen displays:

- **Serial number:** the device serial number
- **H3:** the nominal current
- **Un:** the nominal voltage
- **Fn:** the nominal frequency
- **Commercial rating:** AccuSine SWP active harmonic filter model
- **Software DSP:** the software versions built into the control and monitoring board

Monitoring via JBUS

Mains Measurements

The communication protocol used is compatible with both JBUS and MODBUS standards. The terms JBUS and MODBUS in this document can therefore be used interchangeably.

NOTE: The parameter addresses are given as “@JBUS Hexa”, and they are equivalent to MODBUS addresses in IEC61131 syntax “%MW Hexa” with 0–based indexes.

Basic Measurement	\$600
Validity of measurements (1 if valid)	\$601
Utility power period in micro seconds	\$602
Utility power voltages U12, U23, U31 in volt	\$603 to \$605
Mean utility power mesh voltage in volt	\$608
Number of parallel connected devices in operation	\$60A
Network Measurement phase 1	\$700
Validity of measurements (1 if valid)	\$701
Utility power RMS current in A	\$71C
har_i/H1 ratio: 1 to 25 utility power odd as a %	\$71D to \$729
Utility power THDI as a %	\$72A
I/In load percentage as a %	\$72B
Network Measurement phase 2	\$800
Validity of measurements (1 if valid)	\$801
Utility power RMS current in A	\$81C
har_i/H1 ratio: 1 to 25 utility power odd as a %	\$81D to \$829
Utility power THDI as a %	\$82A
I/In load percentage as a %	\$82B
Network Measurement phase 3	\$900
Validity of measurements (1 if valid)	\$901
Utility power RMS current in A	\$91C
har_i/H1 ratio: 1 to 25 utility power odd as a %	\$91D to \$929
Utility power THDI as a %	\$92A
I/In load percentage as a %	\$92B

Load Measurements

Load Measurement phase 1	\$2000
Validity of measurements (1 if valid)	\$2001
Load RMS currents in amps	\$201C
har _i /H1 ratio: 1 to 25 mains odd as a %	\$201D to \$2029
Load THDI as a %	\$202A
Load Measurement phase 2	\$2100
Validity of measurements (1 if valid)	\$2101
Load RMS currents in amps	\$211C
har _i /H1 ratio: 1 to 25 mains odd as a %	\$211D to \$2129
Load THDI as a %	\$212A
Load Measurement phase 3	\$2200
Validity of measurements (1 if valid)	\$2201
Load RMS currents in amps	\$221C
har _i /H1 ratio: 1 to 25 mains odd as a %	\$221D to \$2229
Load THDI as a %	\$222A

Neutral Measurement

Neutral measurement	\$2400
Validity of measurements (1 if valid)	\$2401
Mains Neutral RMS current in amps	\$2402
Load Neutral RMS current in amps	\$2403

Parameter Setting

Common Customization Zone

Common Customization Zone:		0
Validity of odd harmonics (3 to 25) to be filtered (1 if valid)		0 to \$B
Reactive compensation (1 if compensation)		\$C
Sensor rating		\$D
Presence of Neutral (1 if present)		\$E
Remote on/off authorization (1 if authorization)		\$F
JBUS Mode	without parity and one stop bit: coded 0 without parity and two stop bit: coded 1 even parity and one stop bit: coded 2 odd parity and one stop bit: coded 3	\$10
JBUS Rate	1200 b/s: coded 0 2400 b/s: coded 1 4800 b/s: coded 2 9600 b/s: coded 3	\$11
JBUS slave number (1 to 255)		\$12
Application type (scenario)		\$13
Number of cabled parallel-connected devices (1 to 4)		\$14
Derating		\$15
Mains rated voltage in volt		\$16
Sensor connected		\$17

Common Industrialization Zone

Common Industrialization Zone:		\$300
Device serial number		\$300
Max tolerance on mains U as a %		\$306
Min tolerance on mains U as a %		\$307

Parameter Zone

Parameter zone		\$500
Filter rating in A		\$500

Operating Indicator

Board Status Zone:		\$1500
Filter in operation = 3 (others: filter stopped)		\$1505

Troubleshooting

Alarms

Alarm Message in Display	Description and Corrective Actions
MERY PC board fault 1	The main control and monitoring board is inoperable. Contact Schneider Electric.
Internal fault	Active harmonic filter inoperable. Contact Schneider Electric.
Voltage out of tol.	The amplitude of the mains voltage is outside of the tolerances. Check the presence and amplitude of the three phases and neutral. Check the voltage at the active harmonic filter inlet. The voltage tolerances permitted are defined in the active harmonic filter installation manual.
Frequency out of tol.	Mains frequency is outside of the tolerances. Check mains frequency at the active harmonic filter inlet. The frequency tolerances are defined in the active harmonic filter installation manual.
MERY PC board fault 2	The main control and monitoring board is inoperable. Contact Schneider Electric.
Internal overtemp.	The active harmonic filter has been stopped by the thermal protection thus avoiding damage to the equipment. Check that the three ventilators are operating correctly, that the air vents are clean and check the temperature of the room. The temperature tolerances permitted are defined in the active harmonic filter installation manual.
Harm current > I nom	<p>The harmonic RMS current absorbed by the load exceeds the active harmonic filter nominal current making it operate in current limiting mode.</p> <ul style="list-style-type: none"> • The active harmonic filter limits its compensating current to its nominal current rating. • The load is not entirely compensated. • The harmonic current difference (load harmonic I — compensating I) remains on mains. • The rate of harmonics remaining on mains can affect your installation. • Contact Schneider Electric.

Corrective Actions

Scenario	Corrective Actions
Display and LEDs are off	Check the voltage at the active harmonic filter input. The voltage tolerances permitted are defined in the active harmonic filter installation manual.
Display is OFF	Check that the display is plugged in.
Orange LED is flashing	active harmonic filter is limiting current because the compensation need of the installation is higher than the current the active harmonic filter can supply. active harmonic filter automatically protects itself. The load is not entirely compensated.

Statuses Preventing Restart @JBUS

NOTE: Status 1 indicates a fault.

Digital Input D0: Internal fault D1: Reserved D2: Internal fault D3: Overheat D4: Overheat D5: Overheat D6: Overheat D7: Reserved D8: Reserved D9: Reserved D10: Reserved D11: MERY-1 board fault D12: Reserved D13: Internal fault D14: Internal fault D15: Free	\$1601
Rapid check faults D0: Mains Amplitude Out of Tolerance D1: Mains Amplitude Out of Tolerance D2: Mains Amplitude Out of Tolerance D3: Frequency Out of Tolerance D4: Internal fault D5: Internal fault	\$1607
Slow check fault D0: MERY-1 board fault D1: MERY-1 board fault D2: I > In D3: Reserved	\$160D
Miscellaneous faults: D0: Internal fault D1: Internal fault D2: Internal fault D3: Internal fault D4: Internal fault D5: Internal fault D6: Internal fault D7: Reserved	\$1613
DSP fault D0: MERY-1 board fault D1: MERY-1 board fault D2: MERY-2 board fault D3: MERY-2 board fault D4: MERY-1 board fault D5: MERY-2 board fault D6: MERY-2 board fault D15: Reserved	\$1619
Digital Input 2 D0: Reserved D1: Reserved D2: Reserved D3: Internal fault D4: Internal fault	\$161F

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