INSTALLATION AND OPERATING MANUAL

EN

ATS Controller

ATyS C66

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CONTENTS

1. GENERAL SAFETY INSTRUCTIONS

- This manual provides instructions on safety, connections instructions on the SOCOMEC ATyS C66 ATS controller.
- Whether the ATyS C66 is sold as a loose product, as a spare, in a kit or as part of an enclosed solution or in any other configuration, this device must always be installed and commissioned by qualified and experienced personnel, in line with the manufacturers recommendations, following good engineering practices and after having read and understood the details in the latest release of the relative product instruction manual.
- Maintenance on the product and any other associated equipment including but not limited to servicing operations must be performed by adequately trained and qualified personnel.
- Each product is shipped with a label or other form of marking including rating and other important specific product information. One must also refer to and respect markings on the product prior to installation and commissioning for values and limits specific to that product.
- Using the product outside the intended scope, outside SOCOMEC recommendations or outside the specified the specified ratings and limits can cause personal injury and/or damage to equipment.
- This instruction manual must be made accessible so as to be easily available to anyone who may need to read it in relation to the use, installation or maintenance of the ATyS C66
- The ATyS C66 is cULus Listed to UL 61010-2-201 is certified to UR 1008 for transfer switches and complies with NFPA 70 and NFPA 110 requirements for emergency systems.
- No covers on the ATyS C66 should be opened (with or without voltage) as there may still be dangerous voltages inside the product such as those from external circuits.
- **Do not handle any control or power cables connected to the ATyS C66 when voltage may be present on the product directly through the mains or indirectly through external circuits.**
- Voltages associated with this product may cause injury, electric shock, burns or death. Prior to carrying out any maintenance or other actions on live parts in the vicinity of exposed live parts, ensure that the switch including all control and associated circuits are de-energized.

DANGER	**RISK: Electric shock, burns, death**
WARNING	**RISK: Possible personal injury**
CAUTION	**RISK: Equipment damage**

The information provided in this instruction manual is subject to change without notice, remains for general information only and is non-contractual.

2. INTRODUCTION

ATYS C66 ATS controller is compliant to international product standards and is designed specifically for use in low voltage power applications to ensure the safe transfer of a load supply between a normal and an alternate source.

The ATyS C66 is a universal automatic transfer switch controller that has the capability to manage power contactor type as well as circuit breaker type of transfer switching equipment.

Besides being listed to UL 61010 product standard, the C66 is also UL 1008 listed when used together with a Socomec ATyS FT (fast transfer) or ATyS DT (delayed transition) transfer switches.

This version of instruction sheet is based on C66 product with firmware version 2.3.

The latest firmware versions are available on the Socomec website : https://www.socomec.us.

The firmware upgrade is done using the Product Upgrade Tool software (also available on the Socomec website), and connecting the PC to the Micro USB port of the C66.

ATyS C66 automatic transfer switch (ATS) controllers ensure:

- Safe controls for transfer between a normal and alternate source
- Intuitive and simple controls for local operation
- Quick easy and safe electrical manual operation
- Straightforward installation with effective ergonomics
- A simple and secure control interface
- Easy mounting and smart configuration
- Suitable for indoor and outdoor applications up to Nema 3R12 without the need for additional accessories.

Glossary:

ATS: Automatic Transfer Switch
ACB: Air Circuit Breaker
MCCB: Molded Case Circuit Breaker
FT: Fast Transfer
DT: Delayed Transition
SCPD: Short Circuit Protection Device
CT: Current Transformer
VT: Voltage Transformer
GND: Ground
I/O: Inputs/Outputs
RTC: Real Time Clock
ECS: Easy Config System
S1: Source 1
S2: Source 2
EMC: Electromagnetic compatibility
RMS: Root Mean Square

3. QUICK START

QUICK START GUIDE

EN

549349E

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ATyS C66

ATS Controller

Preliminary operations

- Check the following upon delivery and after removal of the packaging:
- Packaging and contents are in good condition.
- The product reference corresponds to the order.
- Contents should include:
  - Qty 1 x C66 Controller
  - Qty 1 x Controller gasket for NEMA 3R12
  - Qty 4x door mounting screws
  - Qty 4x backplate mounting feet

Warning

⚠Risk of electrocution, burns or injury to persons and / or damage to equipment.

This Quick Start is intended for personnel trained in the installation and commissioning of this product. For further details refer to the product instruction manual available on the SOCOMEC website.

- This product must always be installed and commissioned by qualified and approved personnel.
- Maintenance and servicing operations should be performed by trained and authorized personnel.
- Do not handle any control or power cables connected to the product when voltage may be, or may become present on the product, directly through the mains or indirectly through external circuits.
- Always use an appropriate voltage detection device to confirm the absence of voltage.
- Ensure that no metal objects are allowed to fall in the cabinet (risk of electrical arcing).

Failure to observe good engineering practices as well as to follow these safety instructions may expose the user and others to serious injury or death.

⚠Risk of damaging the device.

- In case the product is dropped or damaged in any way it is recommended to replace the complete product.
- Installation standards must be respected.

Accessories

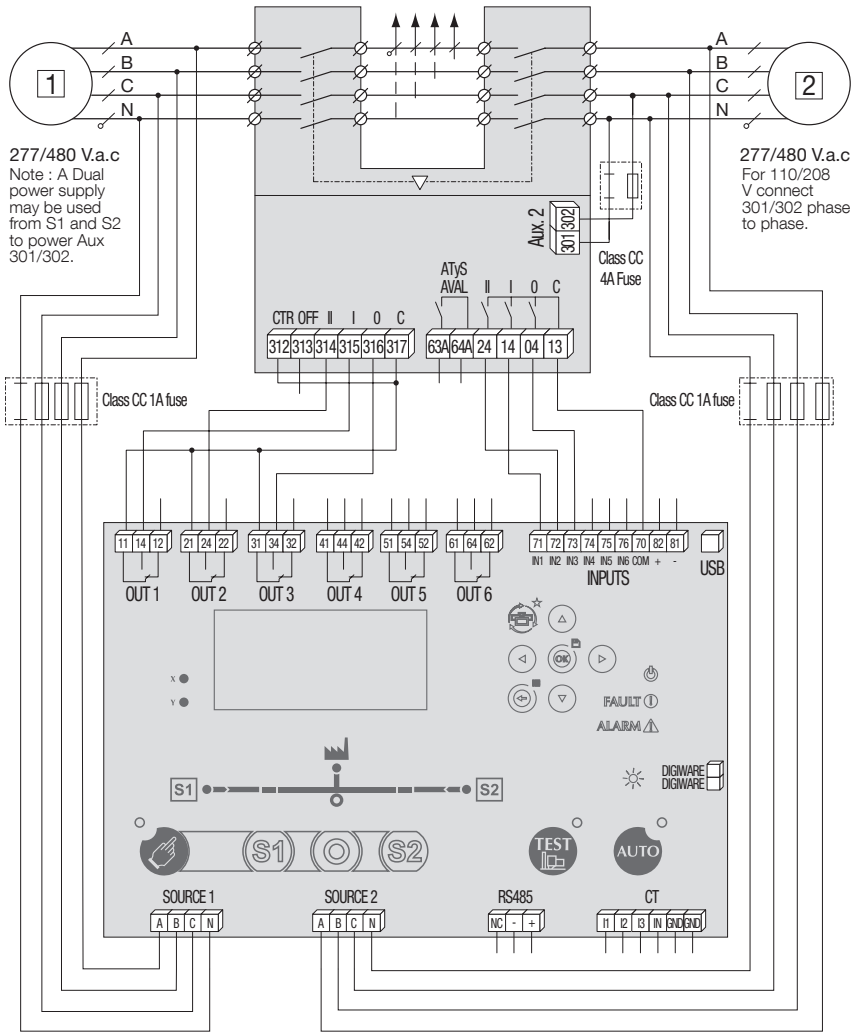
- Digiware I/O 10 (ref. 48290140)
- Gateway M70 (ref. 48290222)
- Controller 24 VDC aux power supply (6W minimum type SELV) mandatory with I/0 10 Modules (Ref. 4829 0120)

* For further details refer to the product instruction manual under chapter “Spares and Accessories”.

Spares

- Connector kit (ref. 16090002)
- Controller mounting feet (ref. 16090005)
- Controller mounting screws (ref. 16090004)
- Controller NEMA 3R12 gasket (ref. 16090001)

Connection diagram with ATYS UL

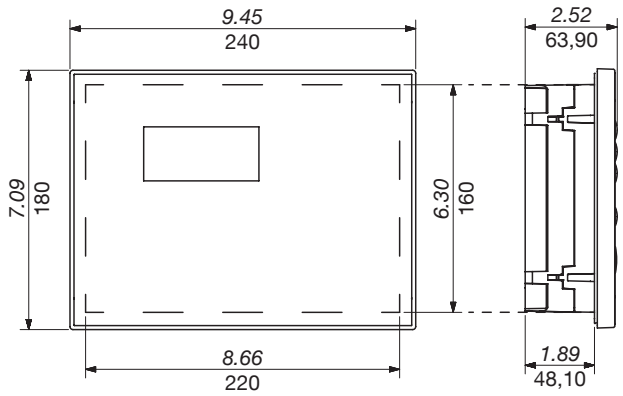


UL61010

Non contractual document.
Subject to change without notice.

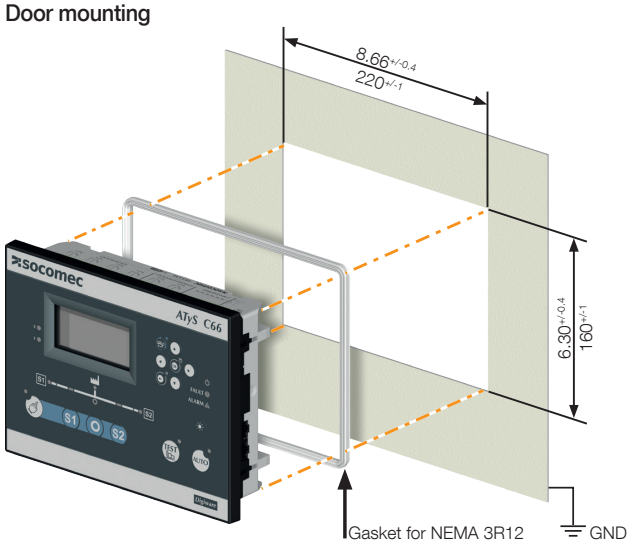
Product dimensions

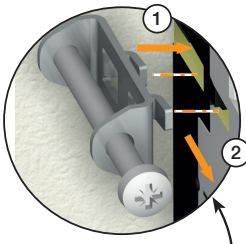
Dual Dimensions
in/mm



1 Mounting & connecting controller

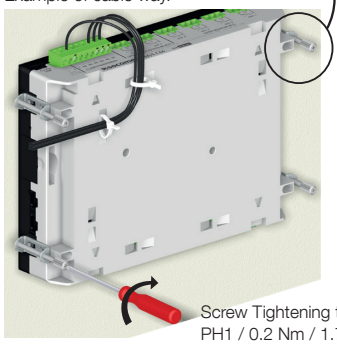
Door mounting





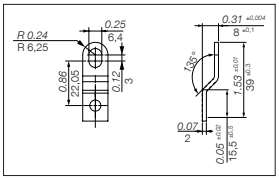
Insert the 4 door mounting screws in the designated slot and push back to lock in place.

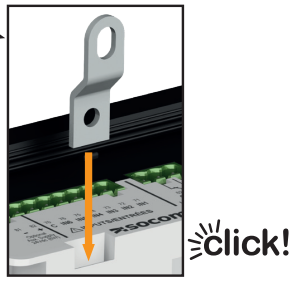
Example of cable way.



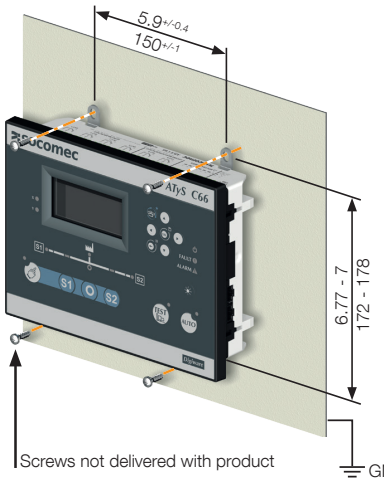
Screw Tightening torque
PH1 / 0.2 Nm / 1.77 lb.in

Backplate mounting

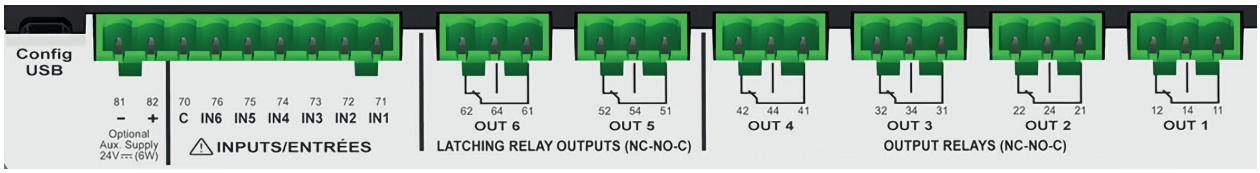




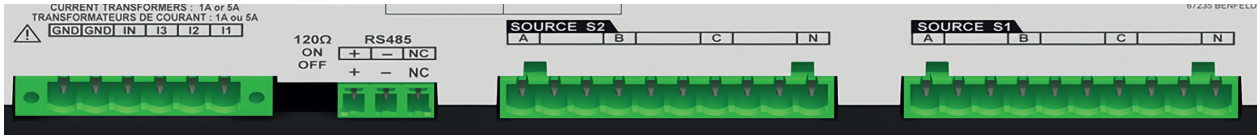
Clip the mounting feet in the designated slot



2 Controller wiring



Top view

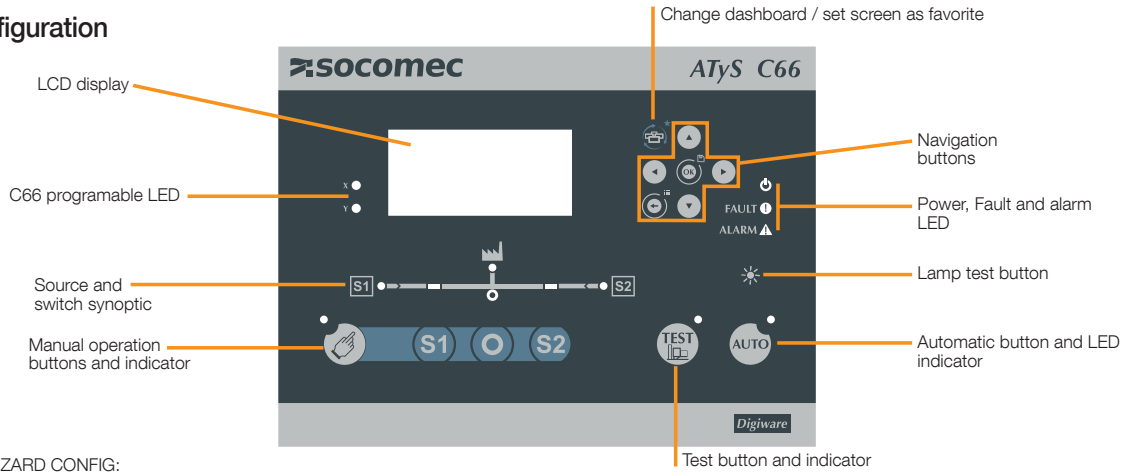


Bottom view

Type	Terminal N°	Description	Characteristics	Recomended cross section
Inputs	71	IN1: programmable input 1	Do not connect to any power supply from terminal 70 common point.	1.5-2.5mm² AWG 16-14 Tightening torque 0.5-0.6 Nm 4.4-5.3 Lb.in
	72	IN2: programmable input 2		
	73	IN3: programmable input 3		
	74	IN4: programmable input 4		
	75	IN5: programmable input 5		
	76	IN6: programmable input 6		
	70	Common point for inputs		
Aux power supply	81/82	- : negative terminal for aux supply +: positive terminal of aux supply	12-24 Vd.c.	
Outputs	12/14/11	OUT1: programmable output 1	Dry contacts 8A / 277 VAC 50/60 Hz 5A / 24 VDC	
	22/24/21	OUT2: programmable output 2		
	32/34/31	OUT3: programmable output 3		
	42/44/41	OUT4: programmable output 4		
Latching relays	52/54/51	OUT 5: programmable output 5 (latching)		
	62/64/61	OUT 6: programmable output 6 (latching)		
Current transformers	IN/I3/I2/I1	CT neutal / CT phase C / CT phase B / CT phase A	CT input 1A or 5A	
Serial connection	RS485	Connection RS485 -: negative terminal of RS485 bus +: positive terminal of RS485 bus NC : Ground	RS485 bus insulated	LiYCY sheilded twisted pair 0.14 to 1.5 mm² / 30-14 AWG Tightening torque 0,22 -0,25 Nm 1.9-2.2 Lb.in
Digiware*	DIGIBUS	Connection point for I/O 10 optional accessories (must use 24 VDC input)	RJ 45 digiware cable	

* For more information check I/O module instruction sheet ref 545597.

3 Configuration



SMART WIZARD CONFIG:

When powered for the first time the controller will prompt the user to configure using the wizard. To access the wizard input code 1000 then the configuration will go as follow:

Language ▶ Time & date ▶ Source config ▶ Switch & Application ▶ Product Name ▶ Communication

For advanced configuration go to parameters menu.

4 Visualization

1	SUMMARY
<1.1>	SOURCES
<1.2>	METERING
<1.3>	INFORMATION

2	STATUS
<2.1>	STATE
<2.2>	SYNCHRONIZATION

3	METERING
<3.1>	SYSTEM
<3.2>	I : CURRENT
<3.3>	V : P-N VOLTAGE
<3.4>	U: P-P VOLTAGE
<3.5>	FREQUENCY

4	POWER & ENERGY
<4.1>	SYSTEM
<4.2>	P : ACTIVE POWER
<4.3>	Q : REACTIVE POWER
<4.4>	S : APPARENT POWER
<4.5>	PF : POWER FACTOR
<4.6>	Ea : ACTIVE ENERGY
<4.7>	Er : REACTIVE ENERGY
<4.8>	Es : APPARENT ENERGY
<4.9>	RESET ENERGY

- Short press on this button to cycle the dashboards starting by the dashboard set as favorite.
- Long press to select current dashboard as favorite.

8	MAINTENANCE
<8.1>	ALARM 1
<8.2>	ALARM 2

7	INPUTS OUPUTS
<7.1>	INPUTS
<7.2>	OUTPUTS
<7.3>	EXTERNAL INPUTS
<7.4>	EXTERNAL OUTPUTS

6	ALARMS
<6.1>	ACTIVE ALARMS
<6.2>	FINISHED ALARMS

5	TIMERS
<5.1>	RUNNING TIMERS
<5.2>	SOURCE 1 TIMERS
<5.3>	SOURCE 2 TIMERS
<5.4>	OPTIONAL TIMERS
<5.5>	TEST ORDER TIMERS
<5.6>	EXTERNAL TEST TIMERS

5 Menus & programming

- Short press on this button to go back one level.
- Long press to access the menus.

MAIN MENU
- CONTROL
- LOG
- STATISTICS
- ENGINE EXERCISER
- PARAMETERS
- SPECIFIC FUNCTIONS
- MAINTENANCE
- ABOUT

CONTROL
- MODE / POSITION
- TEST
- MANUAL RETRANSFER

LOG
- EVENT LOG
- EVENT BY DATE
- ALARM LOG
- FAULT LOG

STATISTICS
- CYCLES
- OPERATIONS
- OPERATING HOURS
- SOURCE 1
- SOURCE 2
- GENSET 1
- GENSET 2
- BREAKER
- BYPASS

EXERCISER
- GENERAL PARAMETERS
- CUSTOM 1
- CUSTOM 2
- CUSTOM 3
- CUSTOM 4

SPECIFIC FUNCTIONS
- MANUAL RETRANSFER
- INPHASE TRANSFER
- GO TO CENTER OFF
- ELEVATOR
- FORCED LOAD SHEDDING
- SMART LOAD SHEDDING
- POWER UP IN AUTO
- HVAC COMPRESSOR
- TRIPPING ACTION
- LOAD ADDING
- CYCLER
- COMMIT TO TRANSFER
- DYNAMIC RETURN TIMER

PARAMETERS
- NETWORK
- LOAD
- DISPLAY
- TIMERS
- I/0
- COMMUNICATION
- ALARMS
- PASSWORDS
- WIZARD

NETWORK
- AUTODETECT
- SETUP
- APPLICATION
- OP RANGE S1
- OP RANGE S2

LOAD
- LOAD STATUS
- LOAD TYPE
- RATED CURRENT
- LOAD NAME
- CT PRIMARY
- CT SECONDARY
- NEUTRAL CT PRIMARY
- NEUTRAL CT SECONDARY
- CT PHASE A POLARITY
- CT PHASE B POLARITY
- CT PHASE C POLARITY
- CT NEUTRAL POLARITY

DISPLAY
- SCREEN
- DATE AND TIME
- LED CONFIG
- OPTIONS
- CHANGE PRODUCT NAME
- SCREENSAVER TEXT

TIMERS
- OPERATION
- GENSET SOURCE 1
- GENSET SOURCE 2
- LOAD TESTS
- NO LOAD TESTS

I/O
- INPUTS
- OUTPUTS
- EXTERNAL I/O DETECTION
- EXTERNAL I/O CONFIG

COMMUNICATION
- MODBUS ADDRESS
- RS485 MODBUS
- DIGIBUS COMM
- DIGIWARE MODE

ALARMS
- MEASURE ALARMS
- COMBI ALARMS
- LOGICAL ALARMS
- MAINTEN. ALARMS
- SYSTEM ALARMS

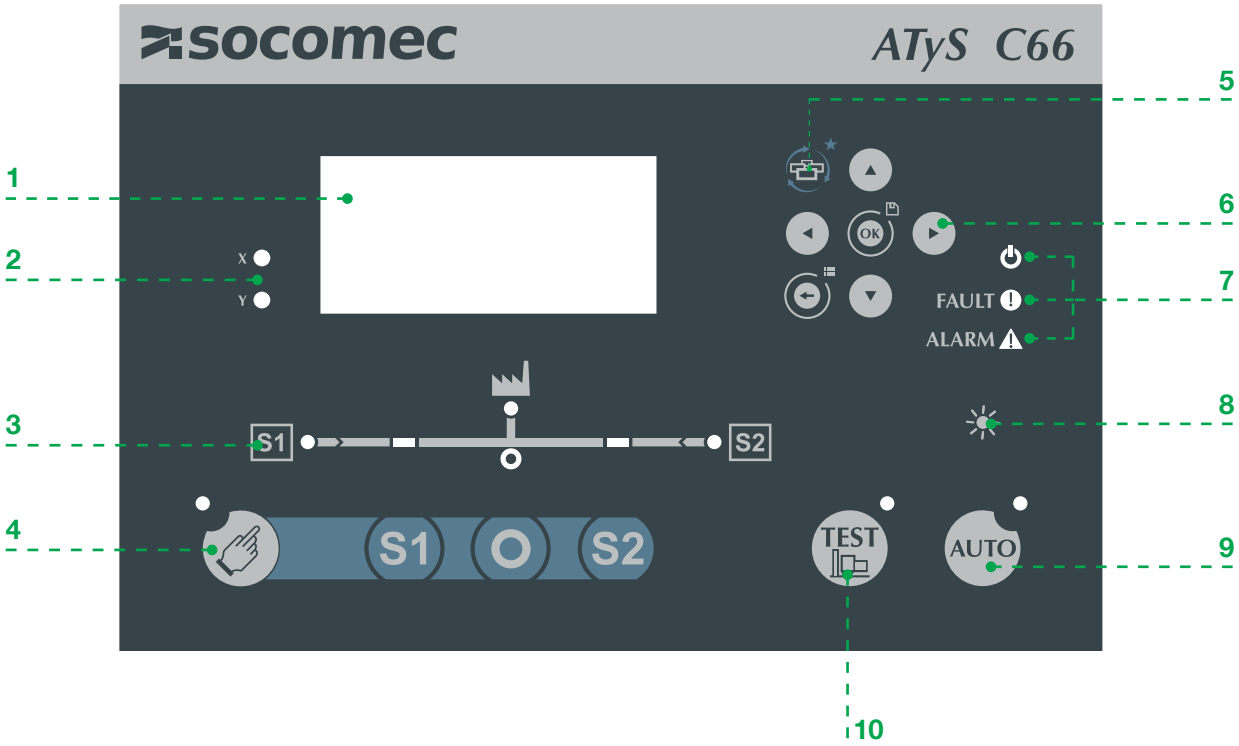
PASSWORDS
- CHANGE OPERATOR PWD
- CHANGE CONFIG PWD
- CHANGE MAINTENANCE PWD
- BACK

4. GENERAL OVERVIEW

The ATyS C66 ATS Controller reference 1600 0066 includes:

- 1 ATS Controller
- 1 NEMA 3R12 gasket reference 1609 0001
- 1 mounting kit reference 1609 0004
  Set of 4 screws and metal mounting clips
  Set of 4 backplate mounting feet 1609 0004
- 1 set of terminal connectors reference 1609 0005
- Quickstart instruction sheet

All other components described in this instruction manual are available as accessories and sold separately.



1. LCD display
2. Programmable LED's
3. Source availability and switch position synoptic
4. Electric manual operation push buttons and status indicator
5. Change dashboard screen / set screen as favorite (hold 1,5s to set screen as favourite)
6. Navigation arrows (Up/Down/Left/Right)
7. Power, Fault and alarm LED
8. Lamp test button / Clear faults (hold 1,5s to clear faults)
9. Automatic mode push button and LED status indicator
10. Test button and status indicator

5. ENVIRONMENTAL

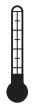
The ATyS C66 controllers meet the following environmental requirements:

5.1. NEMA Rating

- Up to NEMA 3R12 mounted with the supplied gasket.IP30 door mounted without gasket.

5.2. Operating Conditions

5.2.1. Temperature



- From -22 to +158 °F (-30 to +70°C).

  NOTE: With limitations on the LCD screen that may show temporary distortion below 14°F (-10°C).

5.2.2. Hygrometry

- 95% humidity without condensation at 130°F (55° C).

5.2.3. Altitude

- Up to 6560ft (2000m).

5.3. Storage Conditions

5.3.1. Temperature

- From -40° to 158°F (-40 to +70°C).

5.3.2. Hygrometry

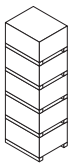
- Recommendation: to be stored in dry, non-corrosive and non-saline atmospheric conditions.

5.3.3. Storage duration period

- Maximum storage up to a period of 12 months

5.3.4. Storage position

- maximum of 5 boxes may be stacked vertically



5.3.5. Volume and shipping weights by reference ATyS

Product	Reference Number	Weight (Lbs)		Volume (in) inc packing
		Net	Gross	
ATyS C66	1600 0066	2.4	3.3	11.6x10x4.5 (LxWxH)

6. STANDARD COMPLIANCE AND MARKING

CE marking

Cmim

Lead free process

WEEE Directive 2012/19/EU

Standards compliance

Certified according to:

UL 61010-2-201 listed (File E206136)

UL 61010-1 listed (covered by File E206136)

UR 1008 (File E506172)

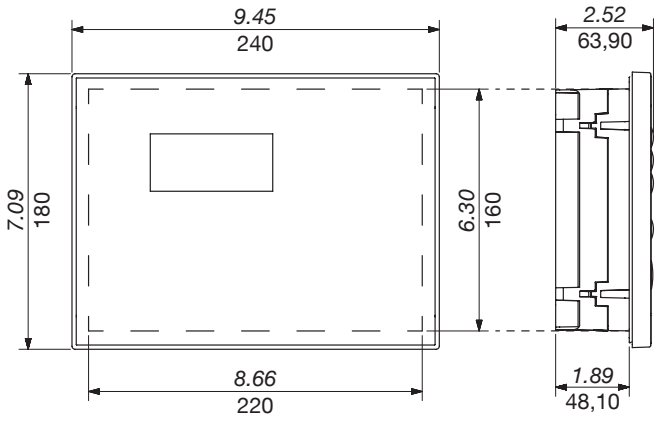
Conforms to the requirements of:

UL 1008 listed when associted with ATyS FT / ATyS DT transfer switch

NFPA 110 and NFPA 70 for emergency systems

7. MOUNTING AND CABLING THE CONTROLLER

7.1. Product dimensions (in/mm)



7.2. Mounting the product

The ATyS C66 can be either mounted on the door or on the backplate of an enclosure.

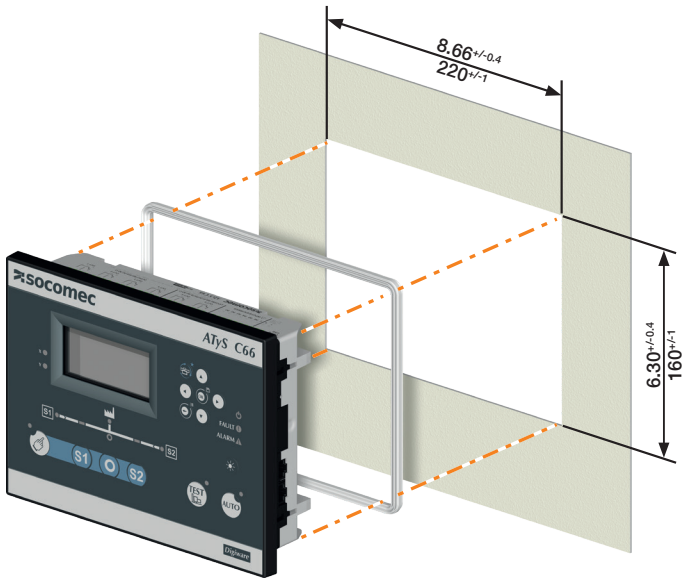
(Both mounting accessory kits are delivered with the product).

7.2.1. Door mounting

The ATyS C66 can be mounted on doors with a cut-out as shown below. The maximum door thickness is 0.15in (4mm).

STEP 1: Cut out for the controller

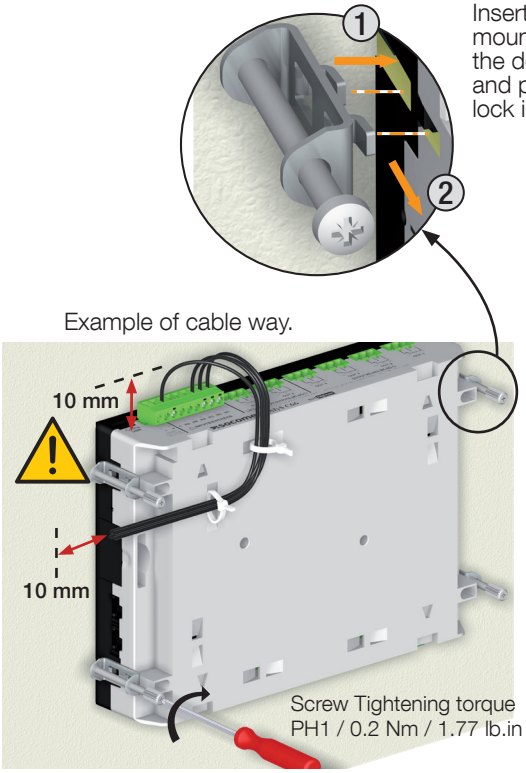
Cut a rectangle hole of 220x160mm / 8.66 x 6.3in on the enclosure door as shown below.



CAUTION ! For Nema 3R12 protection, the gasket must be placed and fitted around the inside edge of the controller as shown above.

STEP 2: Fixing the controller on the door:

Place the ATS controller inside the door cut-out and clip the door mounting screws into the side of the controller as shown. (2 mounting screws on each side). It is important to respect the tightening torque indicated below and to follow good engineering practice when installing the ATS controller.



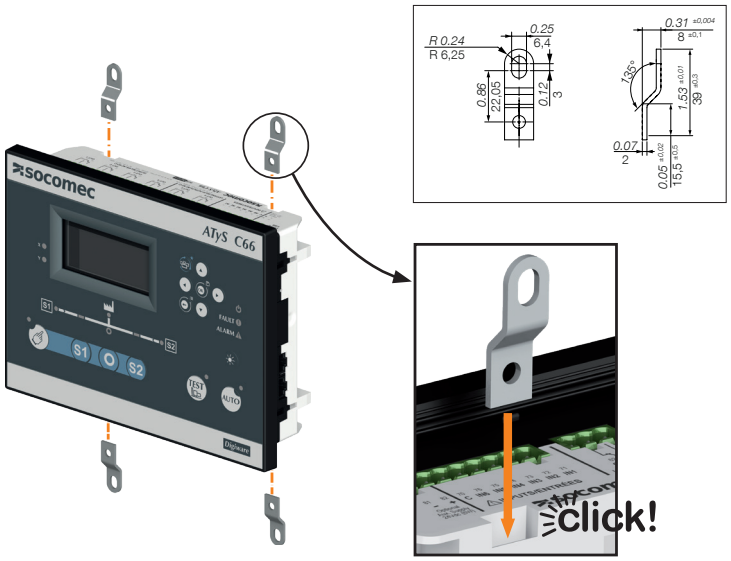
Cable must be more than 10mm away from the RTC battery cover and USB.

Do not drill holes above the controller after it has been mounted.

7.2.2. Backplate mounting

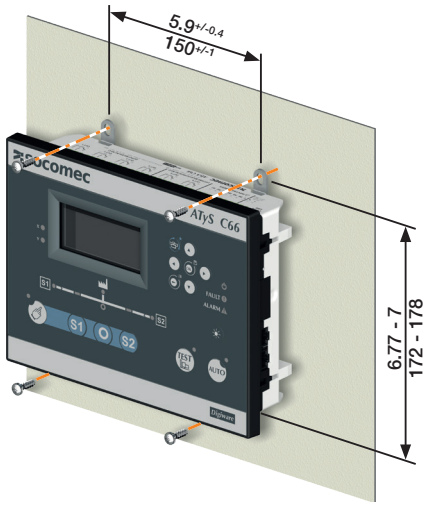
STEP 1: Placing the 4 mounting legs on the controller

Insert the mounting legs into the 4 slots (2 top side and 2 bottom side (cf bellow top side view).



STEP 2: Fixing the controller on the backplate

Drill mounting holes in the backplate to match the fixing holes as shown and indicated below. Fix the controller through the mounting legs to the backplate with a maximum screw diameter of 0.22in/6mm.



Use NRTL certified or Listed industrial enclosures.

Mounting of Digital I/O extension modules (Accessory):

Digital I/O modules are available as an accessory to be ordered separately. Up to six modules can be added to the ATyS C66 controller and are din rail mounted. These optional modules can be ordered using references **Ref. 4829 0140**:

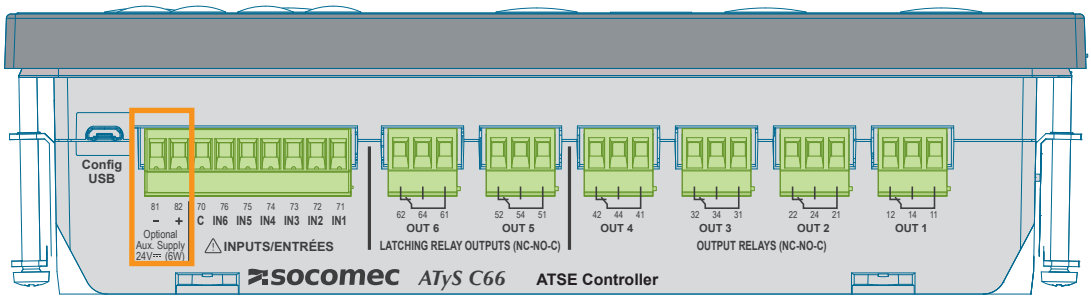
IO input/output modules

DIRIS Digiware IO-10
Digital inputs/outputs
DIRIS Digiware IO-10
Ref. 4829 0140

Digital I/O modules provide additional inputs /outputs to be used with/by the ATyS C66.

To reduce the electromagnetic emissions, it is recommended to minimise the distance between modules and the controller. The maximum length of the digiware bus is 4000 feet (100 meters).

⚠ CAUTION ! The maximum number of I/O optional modules that can be added through the Digiware bus to the controller is 6; this is equivalent to 24 digital inputs and 12 digital outputs.
In order to use the I/O modules the 24VDC input of the C66 controller must be supplied with 24 VDC.

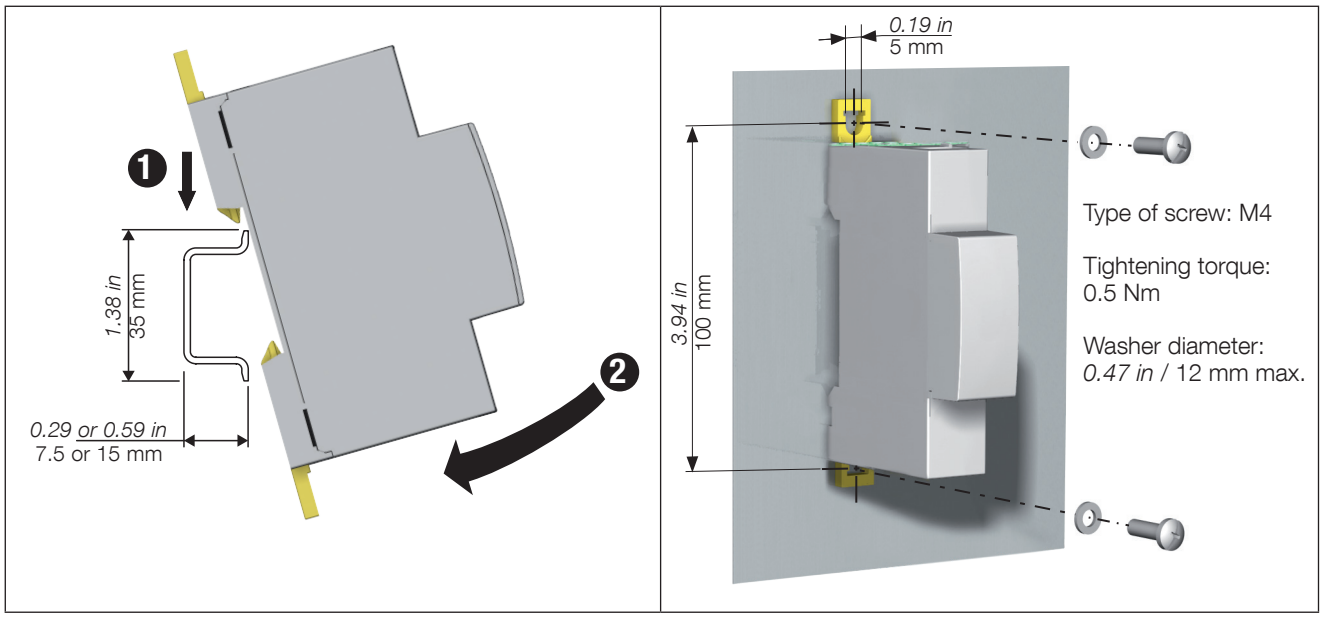


An end-of-the-bus resistor is necessary for a correct communication between the modules and the controller:

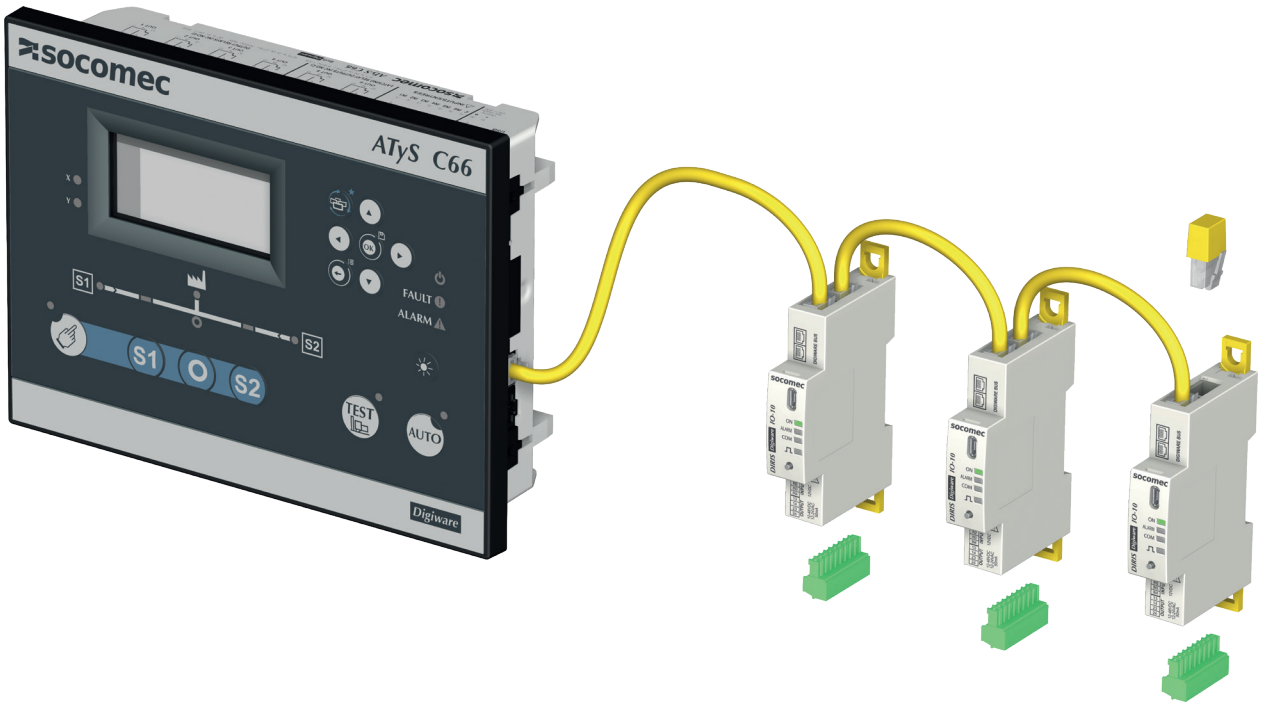
	Quantity	Part number
	1	4829 0180

Mounting the I/O modules:

Position the I/O modules on DIN rail or on backplate as shown on the image bellow.

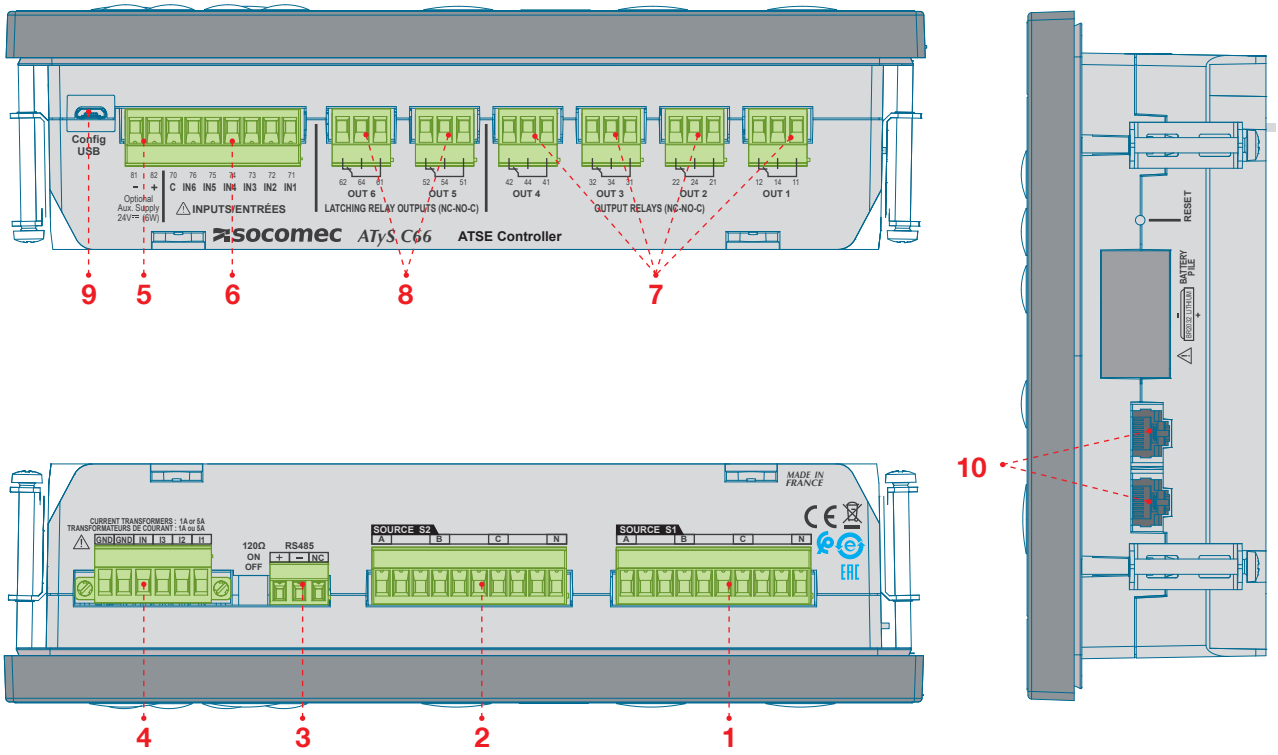


The connection between modules and to the ATyS C66 Digiware input is on the side of the controller by means of an RJ45 connector and after this the other modules are daisy chained (up to 6 modules).



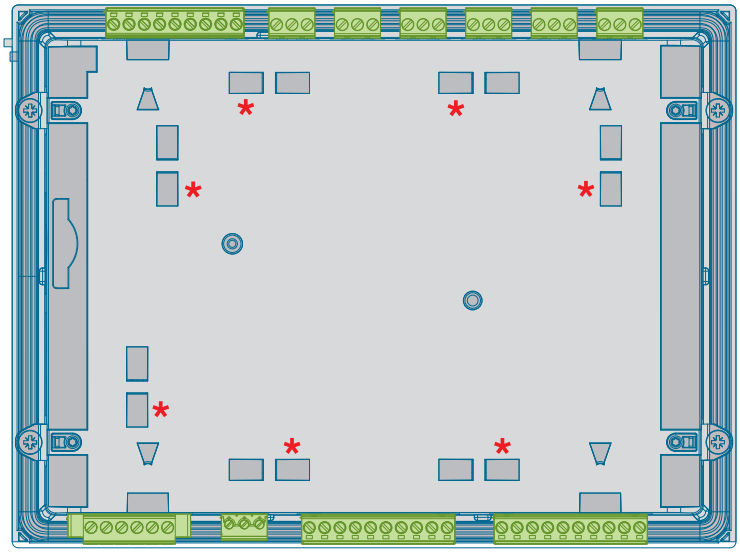
7.3. Terminal Connections

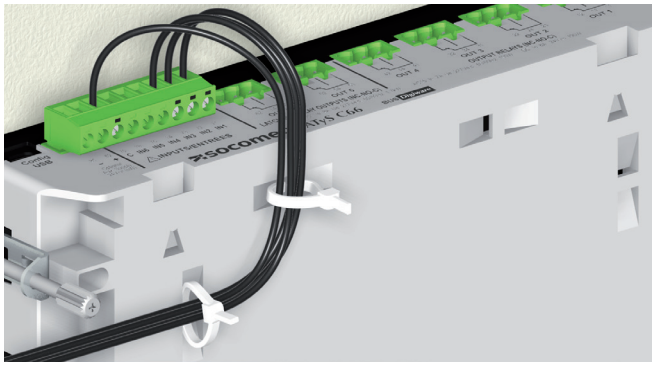
Top / Side / Bottom views:



Securing the wiring harness:

To help secure the control cables the controller includes seven fixing supports on the back of the controller to facilitate wiring and retain the cables in place securely with standard cable ties as shown below *.





N°	Denomination	Terminal	Description	Characteristics	Recommended Cable Section	Tightening torque
1	Voltage sensing source 1	L1 / A	Phase 1 / A	1Ph / 3Ph 50 - 332 / 575VAC (50/60 Hz) (+/- 10%) Impulse V. Withstand Test: 6/8kV* Ui 600V	0.75 - 2.5 mm² AWG 18-14	0.5-0.6 N.m 4.4-5.3 lb.in
		L2 / B	Phase 2 / B			
		L3 / C	Phase 3 / C			
		N	Neutral			
2	Voltage sensing source 2	L1 / A	Phase 1 / A	1Ph / 3Ph 50 - 332 / 575V 575VAC (50/60 Hz) (+/- 10%) Impulse V. Withstand Test: 6/8kV* Ui: 600V		
		L2 / B	Phase 2 / B			
		L3 / C	Phase 3 / C			
		N	Neutral			
3	RS 485	+	DATA + (A)	-	LiYCY sheilded twisted pair 0.14 to 1.5 mm² / AWG 30 - 14	0.22-0.25 N.m 4.4-5.3 lb.in
		-	DATA - (B)			
		NC	Ground			
4	CURRENT TRANSFORMERS	I1 /Ia	CT phase 1 / A	CT Input /1A or /5A	1.5-2.5 mm² AWG 16-14	0.5-0.6 N.m 4.4-5.3 lb.in
		I2 /Ib	CT phase 2 / B			
		I3 /Ic	CT phase 3 / C			
		In	CT neutral			
		GND	Ground			
		GND	Ground			
5	Optional Aux. Supply 24Vdc	81	-	9-28VDC 24VDC -20%/+20% for I/O modules	0.5-2.5 mm² AWG 20-14	
		82	+			
6	PROGRAMMABLE INPUTS	70	COMMON	Do no connect to any power supply. To be used with dry contacts Line maximum length100m		
		71	Input 1			
		72	Input 2			
		73	Input 3			
		74	Input 4			
		75	Input 5			
		76	Input 6			
7	PROGRAMMABLE OUTPUTS	11-12 NC/ 11-14 NO	Output 1	Dry contacts 8A / 277 VAC 50/60 Hz 5A / 24 VDC	1.5-2.5 mm² AWG 16-14	
		21-22 NC/ 21-24 NO	Output 2			
		31-32 NC/ 31-34 NO	Output 3			
		41-42 NC/ 41-44 NO	Output 4			
8	LATCHING RELAYS	51-52 NC/ 51-54 NO	Output 5			
		61-62 NC/ 61-64 NO	Output 6			
9	Config USB	Micro USB	USB 2.0 for configuration	-	Micro USB Type B	-
10	Digiware bus	BUS	2x RJ45 DIGIWARE BUS	CAT V - 600V RJ45 UTP	RJ45 DIGIWARE CABLE	-

Note:
- Use 0.28 in / 7mm as stripping length for the controller terminals.
- Use 194 °F / 90°C copper wire for installations with ambient temperature from 95 - 140°F / 35-60°C. When the ambient temperature is above 140°F / 60°C, Use 221°F / 105°C copper wire.
- Use UL listed current transformers for current and energy monitoring.

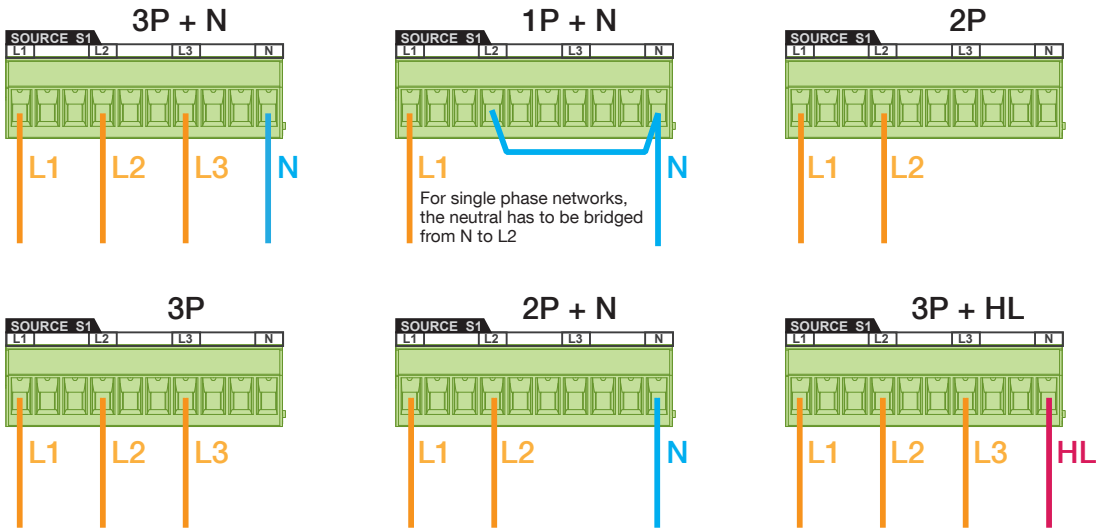
7.3.1. Power Supply

The ATyS C66 controller is Self-powered from the voltage sensing of any available source, and may also be powered (as a backup) from the DC auxiliary power input (24VDC). The controller also includes an internal energy backup of 15 seconds (default value, adjustable up to 30s) to keep the controller and communication in operation during a power outage and during the Genset startup.

7.3.1.1. Dual Power Supply / Sensing

The ATyS C66 controller will be automatically supplied from the voltage sensing connectors of both sources thanks to an internal DPS (dual power supply) module that in case main source failure, will immediately switch to the secondary available source supply.

NOTE: The nominal auxiliary power supply feeding the sensing terminals must be within the limits of 88 -> 576 VAC and wired as follows:

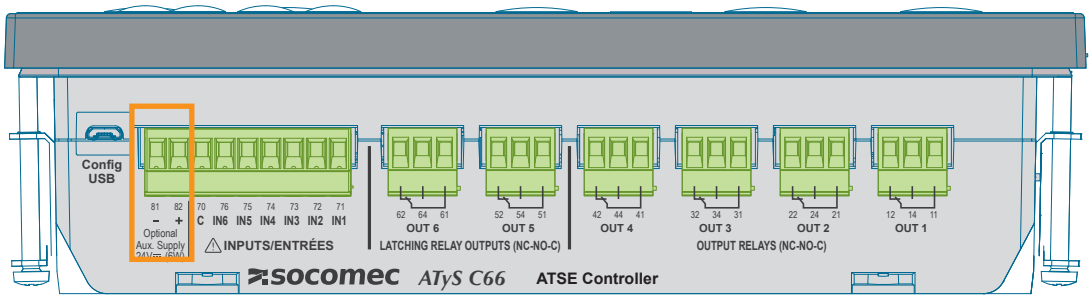


Note: the C66 standalone ATS controller must include a SCPD such as fuses on each phase of the voltage sensing control wiring. Class CC 1A fuses are recommended.

7.3.1.2. DC Power Supply

The ATyS C66 includes an optional DC power supply input to power the controller in case both sources are off for over 15-30 seconds. The DC power supply voltage needed to power up the controller is between 9VDC and 28VDC. The 24VDC power supply is mandatory in case of use with additional external I/O expansion modules.

WARNING ! DC supply is optional when using the controller alone, but necessary in case of using Digiware extension modules (I/O module). When using a DC supply please follow the recommendations below :
- The 24Vdc is SELV (safety extra low voltage) and must be fused and grounded in the installation.
- The current measurement and the digiware will be at the same potential as the 24Vdc.
- RS485 includes functional insulation.



7.3.1.3. Energy Backup

The ATyS C66 has an internal energy backup that will keep the ATS controller powered up for 30 seconds. Setting configured to 15 seconds by default and can be modified inside the maintenance menu. In the case when both sources are not available and there is no DC power supply included the backup energy will keep the main functions of the controller powered so as to inform the user about the ATSE status as follows:

- ATS function (sensing, automatism, relays, genset start…)
- Display screen (with backlight)
- Menus navigation and control pushbuttons
- Communications

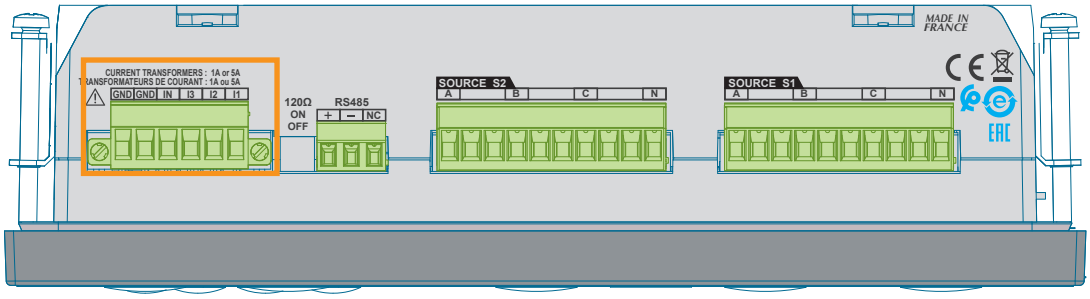
Note:
- The Energy backup will supply the ATyS C66 controller excluding accessories.
- After these 15-30 seconds, the relays outputs and the inputs will no longer be operational and the 2 latching relays (OUT5 and OUT6, contacts 51-54 and 61-64) will automatically change state to start the generator(s) using their own latching relay backup power.

7.3.1.4. Current Measurement

Current measurement can be done with current transformers by connecting the secondary of the transformer between the phases Ia, Ib, Ic and the GND. Neutral can be measured using an additional current transformer. If this is not fitted the neutral current will be calculated using the phase values.

Current transformer's secondary should be /1A or /5A and this configuration needs to be set in the "Parameters" section of the menu. The accuracy of the current measurement on the controller is +/- 1%

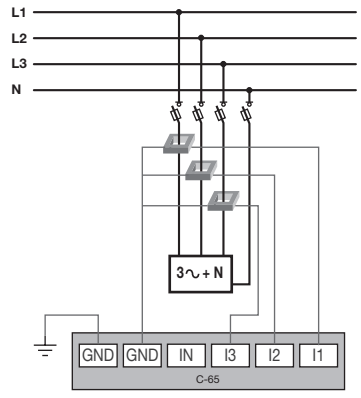
Recommended cable cross sectional area: AWG 16 (1,5mm²).



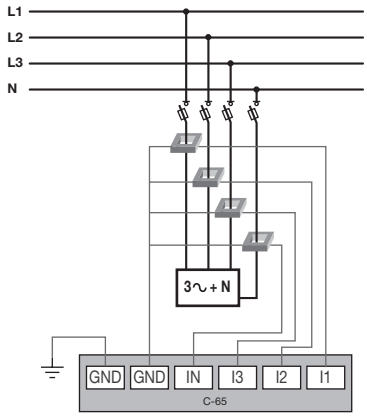
The configuration for the measurement should be done in the Parameters/Load menu (see chapter 11.1.2).

All secondaries of current transformers should be connected between the correct phase and ground (GND):

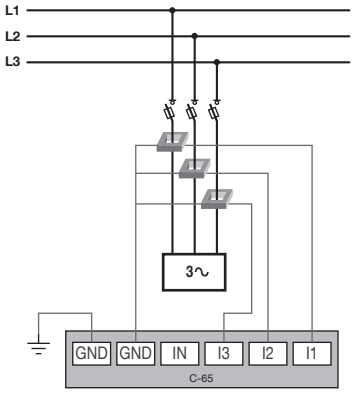
3P + N – 3CT



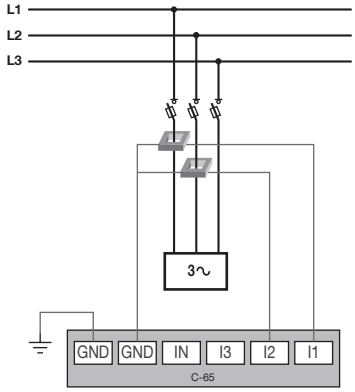
3P+N – 4CT



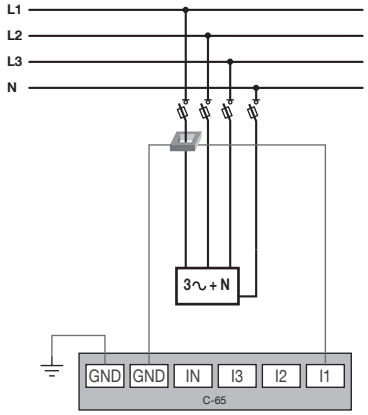
3P – 3CT



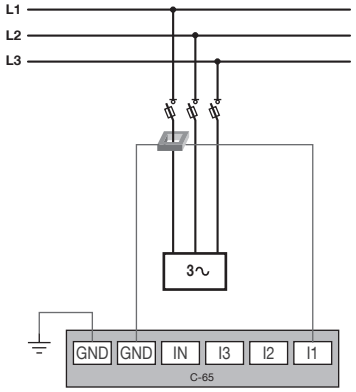
3P – 2CT



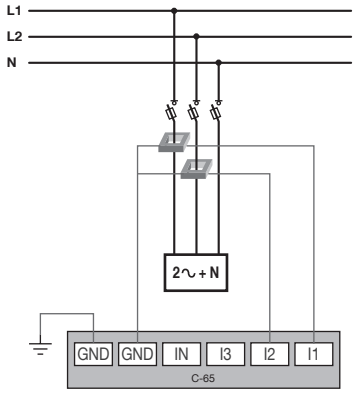
3P + N – 1CT



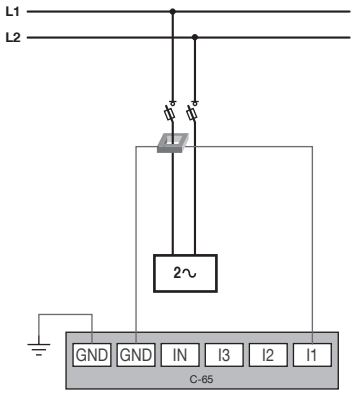
3P – 1CT



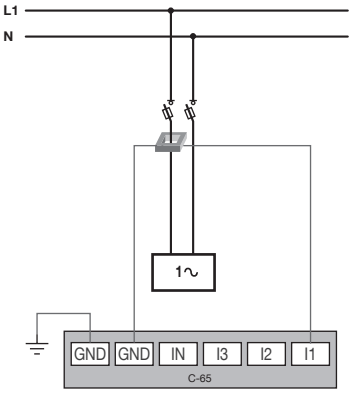
2P + N – 2CT



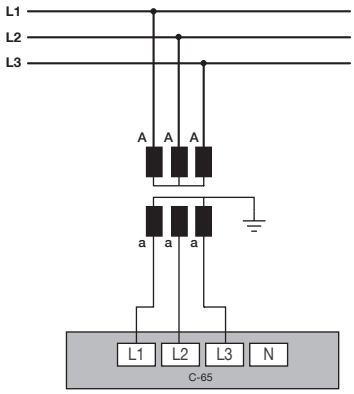
2P – 1CT



1P + N – 1CT

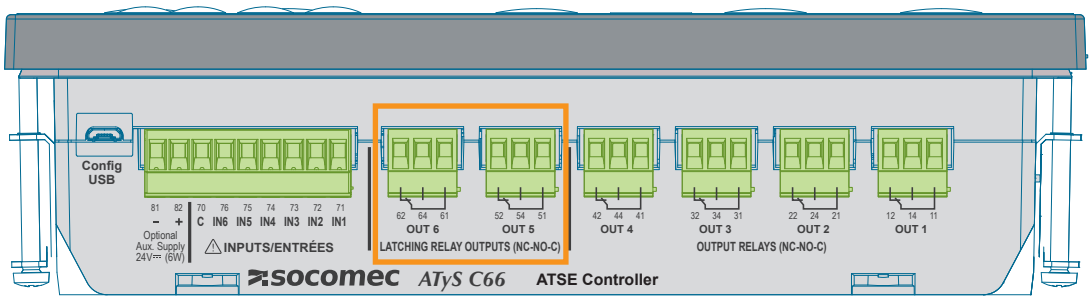


VT - VOLTAGE TRANSFORMER



WARNING ! One of the GND inputs must be grounded.

7.3.1.5. Command circuits



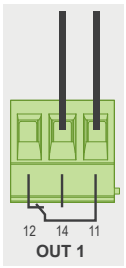
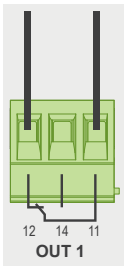
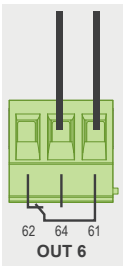
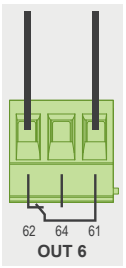
By default, the inputs and outputs in the C66 are set up as follows:

		By default	Configuration changes when changing RTSE technology			
INPUTS	**Switch Tech**	ATyS FT	ATyS DT	Breakers	Contactors	ATyS UL
	Input 1	SWITCH IN POS 1	SWITCH IN POS 1	BRK1 CLOSED	SWITCH IN POS 1	SWITCH IN POS 1
	Input 2	SWITCH IN POS2	SWITCH IN POS2	BRK2 CLOSED	SWITCH IN POS2	SWITCH IN POS2
	Input 3	COVER OPEN	SWITCH S1 IN POS 0	BRK1 OPEN	COVER OPEN	SWITCH IN POS0
	Input 4	INHIBIT S1	SWITCH S2 IN POS 0	BRK2 OPEN	INHIBIT S1	INHIBIT S1
	Input 5	INHIBIT S2	INHIBIT S2	INSHIBIT S2	INHIBIT S2	INHIBIT S2
	Input 6	EXT LOAD TEST	EXT LOAD TEST	EXT LOAD TEST	EXT LOAD TEST	EXT LOAD TEST
OUTPUTS	Output 1	POS 1 ORDER	POS 1 ORDER	CLOSE BRK1	POS 1 ORDER	POS 1 ORDER
	Output 2	POS 2 ORDER	POS 2 ORDER	CLOSE BRK2	POS 2 ORDER	POS 2 ORDER
	Output 3	POS 1 ORDER	POS 0 ORDER S1	OPEN BRK1	NONE	POS 0 ORDER
	Output 4	POS 2 ORDER	POS 0 ORDER S2	OPEN BRK2	NONE	NONE
	Output 5	ELEVATOR	ELEVATOR[1]	ELEVATOR[1]	ELEVATOR[1]	ELEVATOR[1]
	Output 6	GENSET S2 START	GENSET S2 START	GENSET S2 START	GENSET S2 START	GENSET S2 START
	Logic	Impulse[2]	Impulse	Impulse	Maintained	Impulse

[1] See chapter specific functions for more details.
[2] Impulse duration and length and number of retries can be configured in "NETWORK"=>"APPLICATION".

Important note: for use with ATyS DT , POS 0 means "Center OFF", SWITCH S1 IN POS 0 Means source 1 opened, SWITCH S2 in POS 0 means SOURCE 2 open. POS 0 ORDER S1, means order to open source 1, POS 0 order S2 means order to open source 2.

All inputs and outputs can be configured and functions can be changed by going in the Parameters / I/O menu of the controller. For the cabling, please consider the following table of functioning:

		Cabling Output relays 1-4		Cabling Output Latching relays 5 & 6	
					
Controller config	**STATE (relay)**	Normally Open (NO) (11-14)	Normally Closed (NC (11-12))	Normally Open (NO) (61-64)	Normally Closed (NC) (61-62)
Output configured as NO	OFF (not active)	Open	Closed	Open	Closed
	ON (activated by firmware)	Closed	Open	Closed	Open
	Controller not supplied	Open	Closed	Closed*	Open*
Output configured as NC	OFF (not active)	Closed	Open	Closed	Open
	ON (activated by firmware)	Open	Closed	Open	Closed
	Controller not supplied	Open	Closed	Closed*	Open*

ATyS C66 controllers have added security levels to ensure power availability to the loads.

Outputs 5 and/or 6 are by default to be used as genset start/stop relays however are still configurable by the user.

These latching relays will change state as follows:

- When the controller logic sends a signal such as genset start order (after the failure timer has elapsed),
- When the device loses all power including the controller 15s energy backup as well as the relay energy backup

Note: the latching relays will change state (NO will close) after 10-15min of no power supply on the controller.

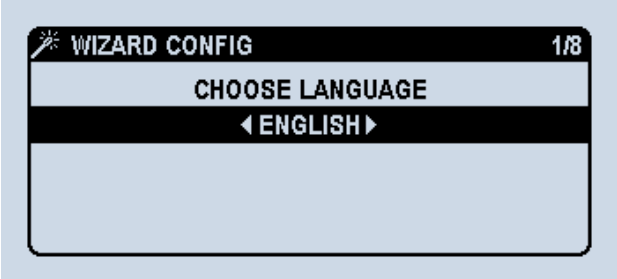
CAUTION ! It is highly recommended to cable the outputs 5 and 6 as NO (Normally Open) to benefit from the above feature.

8. FIRST POWER UP – SMART WIZARD

Once the controller is connected to the switch with the cable harness, as soon as the controller is powered up, it will automatically start in MANUAL mode and, in order to facilitate the commissioning, a smart wizard will appear to drive the user through the main configuration parameters.

The first out of 8 questions will be the language. User can choose between the following 3 languages:

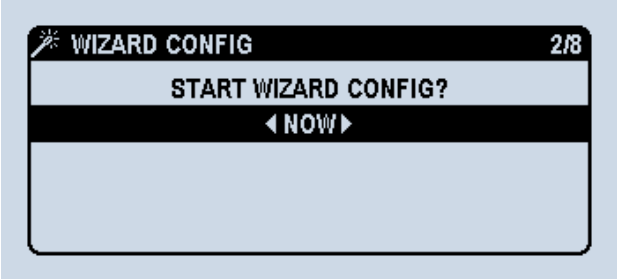
- English
- French
- Spanish



Then it will follow the option to start the wizard with the following options:

- Start now
- Remind me the next power on
- Never ask me again

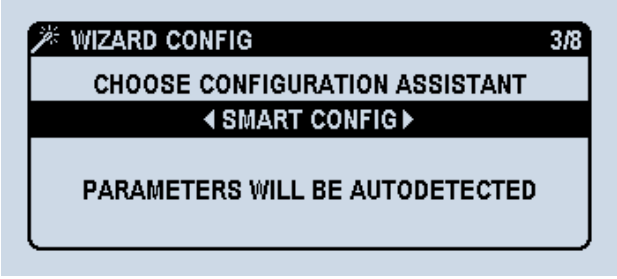
The wizard will remain accessible inside the menu PARAMETERS/WIZARD.



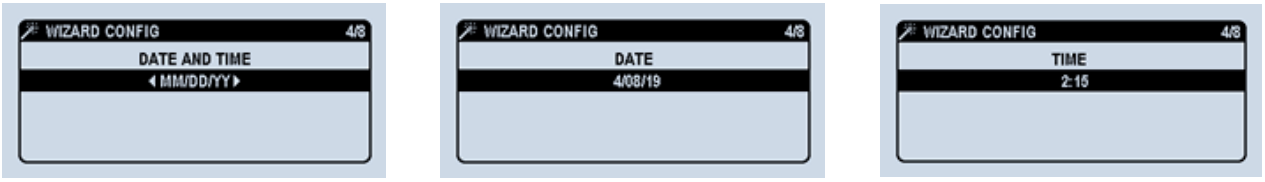
In case the decision taken is to begin with the wizard configuration, then the options are:

- To use the smart configuration: parameters like voltage, frequency and phase rotation will be auto detected and proposed to the user.
- To use the manual configuration: the user needs to enter the values manually.

The controller will require the configurator 4-digit password before the configuration (**by default set to 1000**).

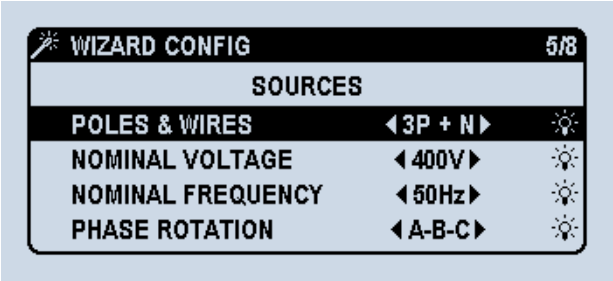


Once the configuration starts, the user needs to enter the date format, date and time as follows:



These time/date values will be saved and from that moment the RTC battery will keep the clock running even if the supply to the controller is lost.

Once these parameters are set, the next step is the source settings, where the user has to confirm the values proposed by the controller (in case of smart configuration) or enter the values (in case of manual configuration) for the number of poles of the switch / wires coming from the sources, nominal voltage, nominal frequency and phase rotation



Step 6 is about the installation parameters.

Application type stands for the type of sources coming to the controller. The options are:

- Main-Genset (by default): Power supply coming from a transformer on the priority source and from a Genset on the non-priority source.
- Main-Main: Power supply coming from a transformer for both sources 1 and 2.
- Genset-Genset: Power supply coming from a diesel generator for both sources 1 and 2.

Source priority stands for the preferred source in automatic mode when both sources are fully available.
The options are:

- Source 1: the source connected to source 1 sensing on the switch will become the preferred source and the transfer switch will automatically transfer to this source as long as it is available and the timers are respected.
- Source 2: the source connected to source 2 sensing on the switch will become the preferred source and the transfer switch will automatically transfer to this source as long as it is available and the timers are respected.
- No priority: no preferred source. The switch will stay in the same source as long as it is available and will only transfer automatically when it will be lost. In case a source comes back the switch will not transfer automatically as long as the current source is available.

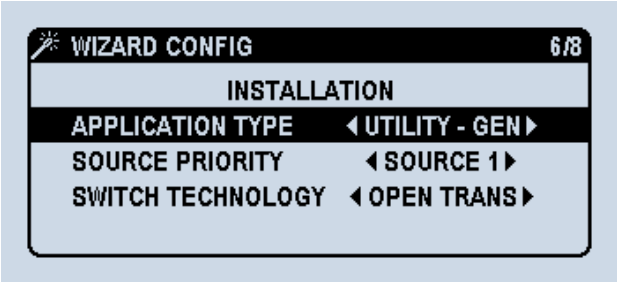
Note: It is possible to connect either the transformer or the genset to both source 1 or 2 during the wizard configuration by selection the priority source, or directly in "PARRAMETERS" > "NETWORK" > "APPLICATION".

CAUTION ! Make sure that the settings are matching your installation for the correct functioning of the transfer switch

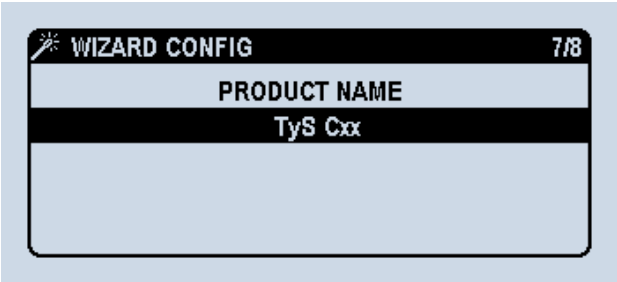
Switch technology stands for the type of switch used with the controller. The options are:

- ATyS FT / OPEN TRANSITION: to be selected when using an open transition single operator power contactor switch with 2 positions: I-II. In this configuration, the in-phase transfer & monitoring will be automatically enabled.
- ATyS DT / DELAYED TRANSITION: to be selected when using an delayed transition dual operator power contactor switch with 3 positions: I - center off – II. In this configuration, in-phase transfer is disabled by default.
- ATyS UL: to be selected when using a motorized TRANSFER SWITCH such as ATyS UL.
- CONTACTOR: to be selected when using 2 separated circuit contactors.
- CIRCUIT BREAKER: to be selected when using 2 separated circuit breakers / air circuit breakers (MCCB or ACB).

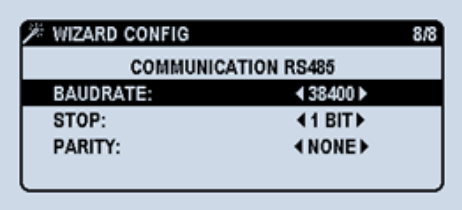
According to this configuration, the INPUTS and OUTPUTS of the controller to pilot the switch and receive the position feedback will be automatically configured to match the application requirements (see values by default in chapter 7.3 and I/O detail in chapter 12) but they can always be modified in the menu PARAMETERS / I/O later on.

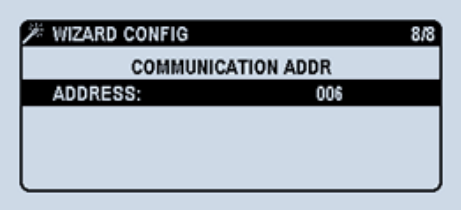


The 7th step is not affecting the functioning of the transfer switch but permits the user to select a name for the product. As default, it's ATyS C66, but it can be changed for any combination of letters, numbers and signs, for instance, "Cooling", "Line 1" or "DTC/21".

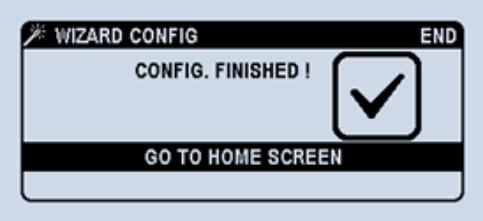


To finalize the configuration, the wizard asks for the communication parameters, such as the slave address (by default 6) and the communication parameters:





After entering and confirming these parameters, the wizard informs that the minimum parameters needed for the transfer switch to work are set and invites to go to the menu home screen where the user can set more parameters and functions manually (see next chapter).

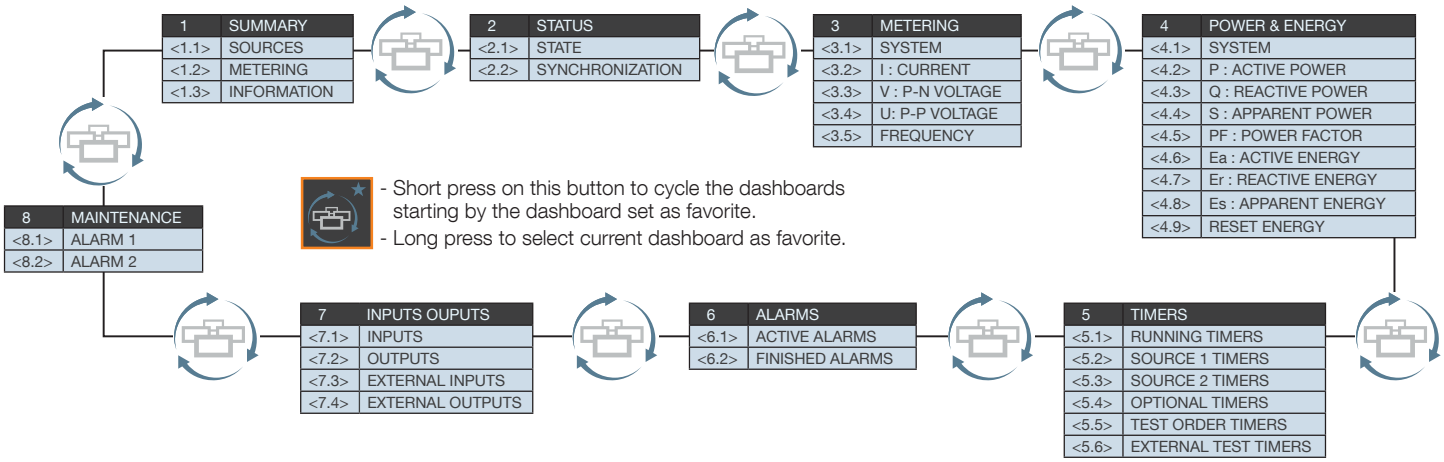


Note: For a detailed configuration please consult chapter "Configuration", page 45.

9. VISUALISATION OPTIONS

The visualisation DASHBOARDS

The controller has a direct access button to the visualization dashboards on the front face. The dashboards can be accessed by short pressing the key. By pressing again we switch from one dashboard to another and inside each dashboard there might be different number of screens as it is shown on the image below. Each dashboard is numbered from 1 to 7 (Ex. 3. METERING) and the screens are numbered using a second digit (Ex. 3.1 METERING - SYSTEM



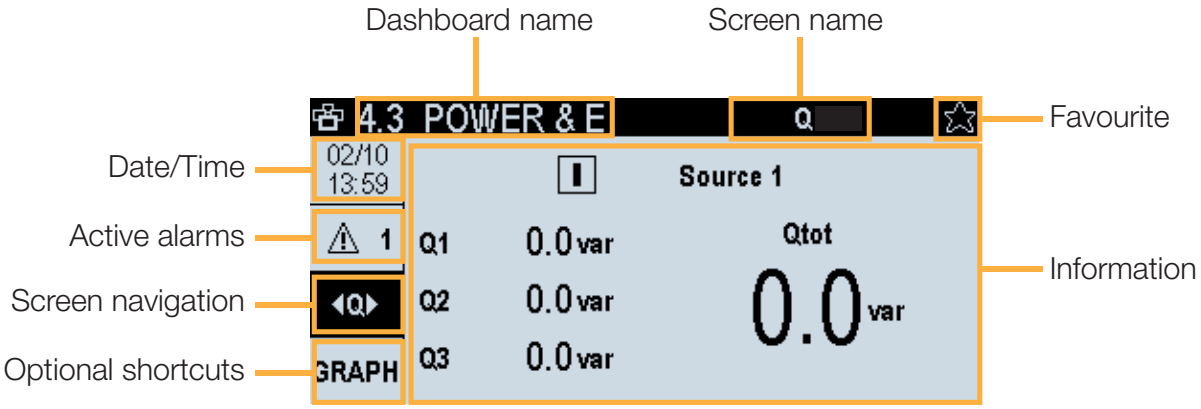
The dashboards can be visualized and screened through without the use of a password.

By pressing the key it gives direct access to these screens (no matter the current menu screen), starting by the screen selected as favorite. To select a screen as favorite maintain the pressed for 1,5 seconds (long-press) while the screen is shown*. When a dashboard screen is selected as favorite the star in the top right hand corner will be shown filled: ★.

*The favorite function is only available for the screens of the dashboard menu.

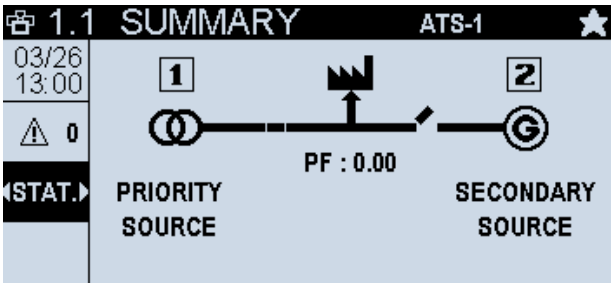
To display the favorite screen after navigation exit the menu by pressing the return key and then press the dashboard key.

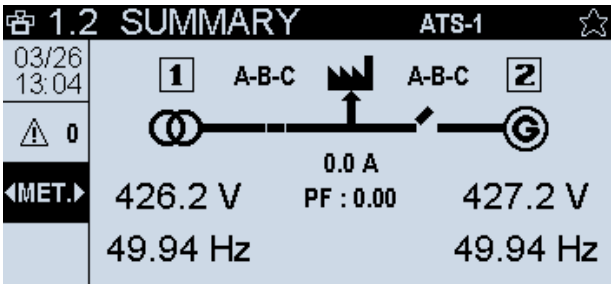
All the dashboards have the same display format logic as follows:



1 - SUMMARY: This screen gives the user information on the availability of the sources, the position of the switch. The user can cycle 3 sub-menus using the navigation arrows:

STAT.: gives the user information on the sources and loads.
MET.: gives the user information on the voltage, current and frequency of the sources.
INFO.: gives information on the time running of each source.

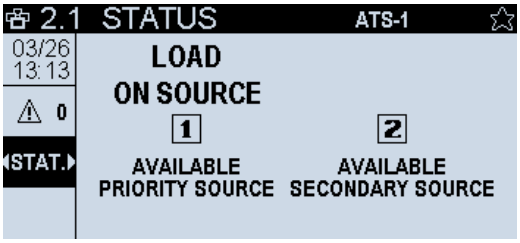


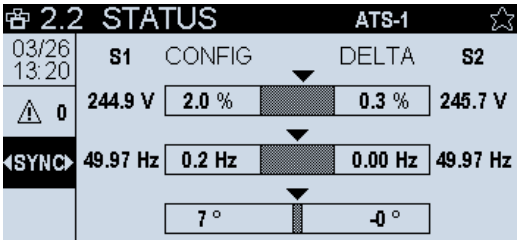


On the Summary display a mimic shows the status of the switch and the supply to the load. The sources will appear crossed if they are not available and not crossed if they are available. This information is also detailed in the status screen 2.1.

2 - STATUS: This screen gives more detailed information on the supply sources

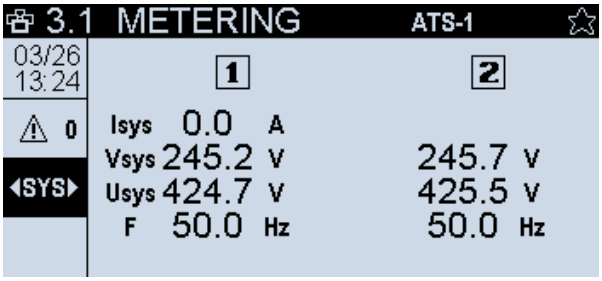
STAT: informs the user on the availability of each source.
SYNC: Information on the voltage, frequency and phase angle of both sources.





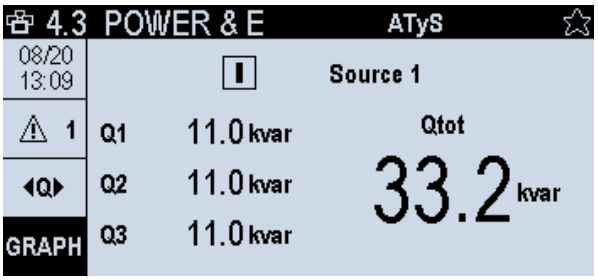
3 - METERING: Allows the user to visualize detailed metering information on the load side.

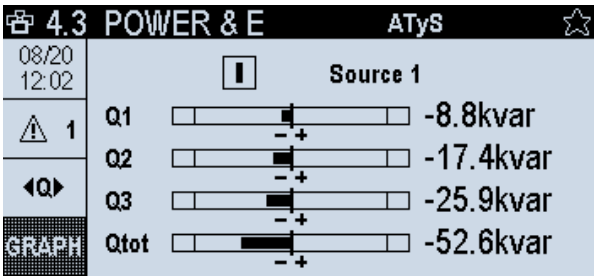
U: Phase-Phase voltage.
V: Phase-Neutral voltage.
F: Frequency.
SYS: Voltage, frequency and current of the system.
I: all currents measured (current transformers need to be connected to use this function).

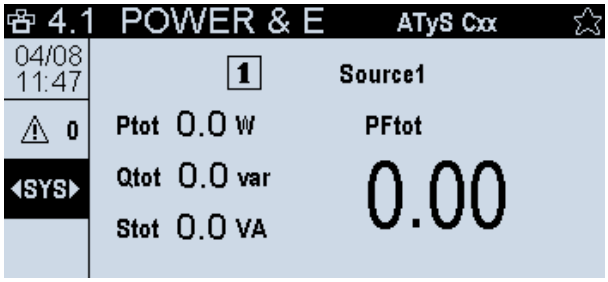


4 - POWER &E: Allows the user to visualize the power and energy used by the load. (Current transformers must be used to enable this function). The information can be shown in numerical or both numerical and bar graph.

SYS:System information including Ptot (total active power used), Qtot (total reactive power used), Stot (total power used) and PFtot (power factor).
P: Active power phase by phase.
Q: Reactive power phase by phase.
S total apparent power phase by phase.
Pf: Power factor phase by phase.
Ea: Active energy.
Er: Reactive energy.
Es: Apparent energy.
RST E : Resets the energy measured.

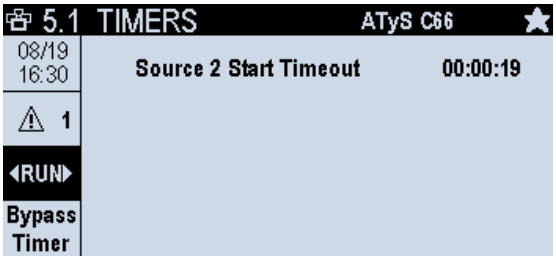






5 - TIMERS: Allows the user to visualize the status of the timers.

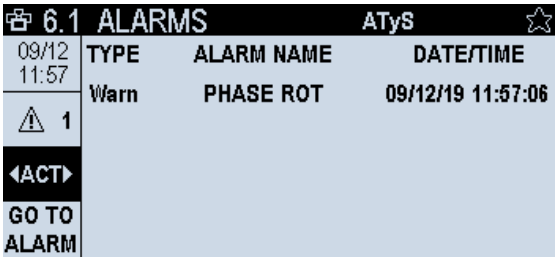
RUN: Shows all the ongoing timers, and allows the user to bypass the timers.
S1: Shows all timers linked to source 1
S2: Shows all timers linked to source 2.
OPT: Shows all optional timers



6 - ALARMS: Allows the user to visualize active and ended alarms. It also has a shortcut by pressing OK to go to the Alarms menu and clear alarms (password protected: operator).

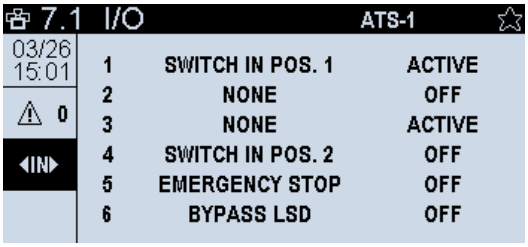
ACT: Shows all active alarms, and allows the user to direct access to the alarm menu.
FIN: Shows all finalized alarms that are not acknowledged by the user.

In this screen, a direct access to the alarm log is available by pressing “down arrow” + “ok”, which will select the GO TO ALARM access in the left bottom of the screen. See more information about the alarm LOG in chapter 10.8.



7 - I/O: Allows the user to visualize the configuration of the inputs and outputs. The settings for the I/O on the controller will be displayed as well as those for external I/O modules (when used).

IN: Controller inputs.
OUT: Controller outputs.
E.IN: External inputs (IO10 modules).
E.OUT: External outputs (IO10 modules).



Visualisation POP-UPS:

The controller will inform the user about the main real-time events through a pop-up on the display.

This pop-up can have 2 types of purpose:

- Timer running: timer pop-ups show the name of the timer that is active, the configured value and the countdown value with double font.

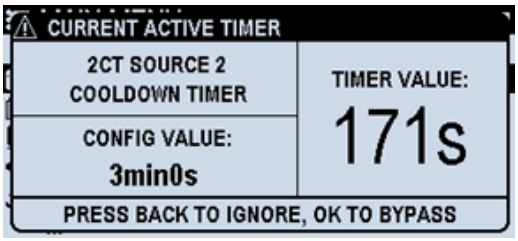
This is a dynamic pop-up that gives 2 options to the user:

Press BACK to ignore (hide the pop-up but the timer will keep running and can be seen in the TIMERS dashboard)

or

OK to bypass (skip the timer and go directly to next action; this can also be done through the input BYPASS TIMER).

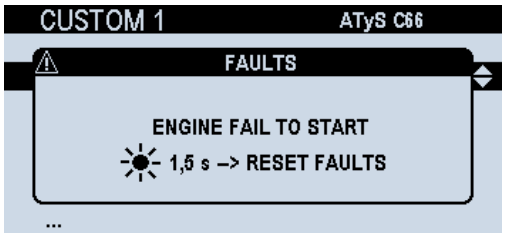
NOTE : Bypassing the timer will request a validation and an operator password.



- Validation / Action requested:

Various events use this type of pop-up, such as fault clearing, confirmation to run a test, confirmation to change parameters, validation to bypass a timer etc…

Usually these type of pop-ups can be ignored by pressing the BACK button whilst others offer various options to the user.

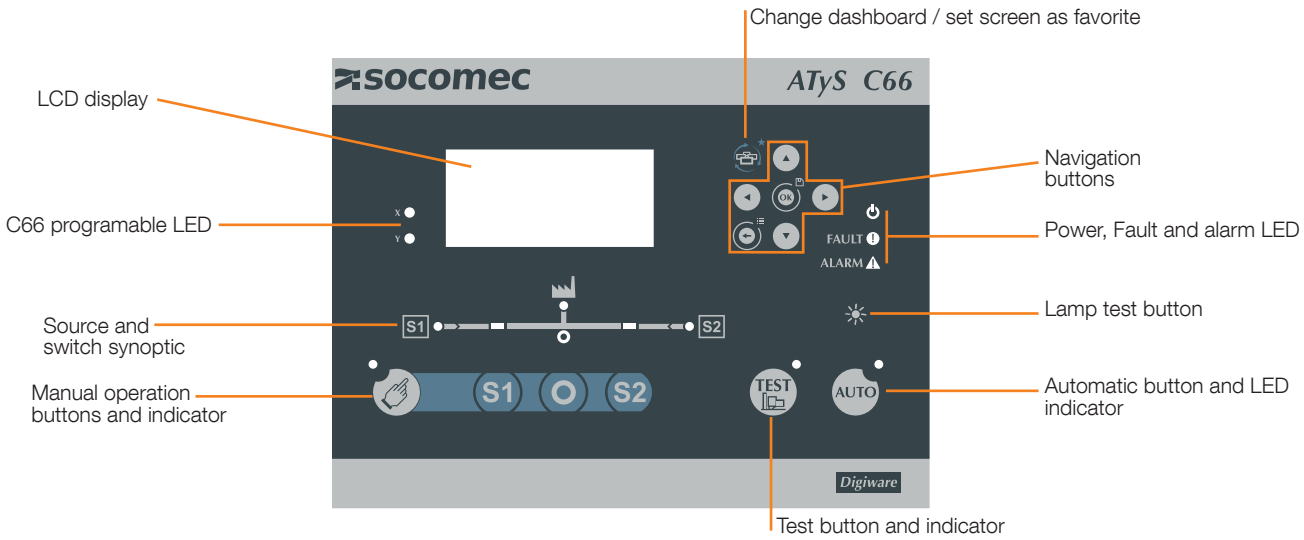


10. OPERATION AND CONTROL

10.1. HMI use

The HMI provides 14 keys/buttons that may be used to configure, operate and visualize the ATS values anytime.

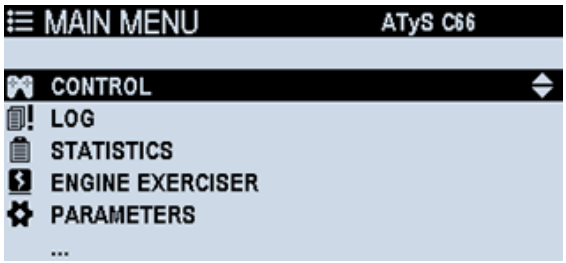
Overview of the HMI



Button	Operation
Manual	Turns on CTRL mode. Allows the use of the I, 0, II buttons that will send position orders to the switch.
Automatic	Turns on AUTO mode. Controller will automatically perform transfers in case of priority source unavailability and priority source comeback.
S1	Position I (source 1) manual order. Only in CTRL mode.
0	Center-offf (position 0) manual order. Only in CTRL mode.
S2	Position II (source 2) manual order. Only in CTRL mode.
TEST	Performs a TEST (as defined inside Parameters/Display/Options menu)
Arrows	Navigation through different screens, menus, options and values.
Lamp Test/Fault clear	Press: lamp test and information about option X and Y LEDs on screen Long press: Clear faults pop-up (only if faults active)
Back/Menu	Press: back/return to previous screen or clear pop-up Long press: Back to Main Menu page
Dashboard/Favorite	Press: Go to the favourite Dashboard / Change between dashboard type (1 to 8, in a loop) Long press: Sets the current dashboard screen as favourite
OK/Save & Quit	Press: Enter / OK / set a value / accept / confirm Long press: (only when configuring) Save and Quit (back to previous configuration screen)

10.2. Navigation Menu

The Menu on the display can be accessed with the Return/Menu button on the front face of the controller. It is structured in different chapters and is easy to navigate through it with the navigation pad. To select a screen use the navigation arrows , then press the ok key to validate the selected screen.



CONTROL – This menu allows to change the operation mode as well as to test position orders and engine start signals. (See chapter 10.7)

LOG – In this menu, the operator can see the list of past events, search an event by date, see the statistics of the transfer switch and manage faults and alarms. (See chapter 10.8)

STATISTICS – This menu gives users information on the use of the ATS system such as, number of cycles, runtime on sources etc...

ENGINE EXERCISER – The operator can set 4 different customized engine start programs and schedule them in a cyclic or non-cyclic mode. (See chapter 10.9)

PARAMETERS – In this menu all the configuration parameters of the controller can be set, as well as the timers, communication, alarms, I/O and display parameters. Passwords and specific functions can also be set in this menu. (See chapter 11.1)

SPECIFIC FUNCTIONS – All functions that are specific for the controller are inside this menu. See all the options in chapter 11.1.9.

MAINTENANCE – This menu is reserved for maintenance purposes (service team). (See service chapter 1)

ABOUT – The main information of the controller is showed on this menu: product serial number, firmware, communication address and the maintenance telephone to call for the service.

The Home screen (Main Menu) can always be accessed by long-pressing the button from any other screen.

10.3. Operating modes

The controller has 4 types of operation modes:

Manual Operation (CTRL mode): it allows the user to take the control of the commands sent by the controller and the automatic procedure is totally disabled.

To enter manual mode, click the Manual operation button:

The LCD will prompt the user to enter the operator password. The Manual mode LED will light up and the manual operation buttons will be enabled. Select S1 to switch to source 1, S2 to go to source 2 and to go to center off position (if existing).

Note: in manual mode, if a source is lost, the genset (if any) will start and the controller will not force an automatic transfer. The controller will remain in manual mode until reverted to Auto by the user.

Automatic Operation: in automatic mode the controller will take full control over the monitoring and switching according to the configuration settings such as operating range, timers, etc.

To switch from manual mode to Automatic mode, ensure that there are no external orders that inhibit automatic mode (inputs, cover open, etc..) and click the automatic operation button: AUTO

The LCD will prompt the user to enter the operator password. The automatic mode LED will light up.

Note: the switch may transfer as soon as automatic mode has been enabled.

Test Mode: This allows an authorized maintenance person to perform a transfer to perform a transfer to backup source (default Source 2) and to decide when to go back to the priority source (default Source 1). The testing of the ENGINE START can be performed using a NO LOAD TEST test in the menu or assigning the TEST button to this function. The TEST mode can be launched from both MANUAL or AUTOMATIC modes.

To switch to TEST mode, make sure there are no external inhibitions and click the automatic operation button: TEST

The LCD will prompt the user to enter the operator password. The TEST mode LED will light up.

Note: the switch may transfer as soon as TEST mode has been enabled, respecting the elevator timers, in-phase timers (for open transition switches with positions I-II) and center-off position timer (if the switch has a 0 position).

Inhibit Mode: This mode is activated in case of major faults, switch cover open. In inhibited mode the switch will not be operable using the controller.

These modes can also be selectable through the display, through inputs or through communications; LED will indicate the state of the switch.

Note: To change the operation mode, a password might be required.

10.4. Availability conditions

There are 3 different status for the sources:

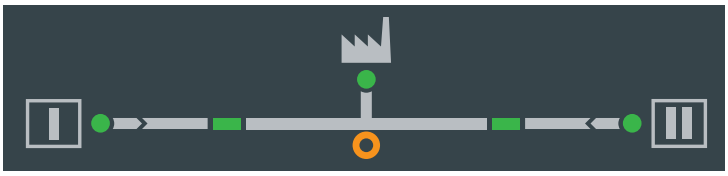
- Dead bus
    - No voltage present on the source (all voltages below 50V).
- Source present
    - Voltage present (at least 1 phase above or equal to 50V) but availability conditions are not reached (see “Source available” below)
- Source available
    - To consider the source available:
        - the voltage and frequency should be inside the limits set in the operating range
        - all phases should be present (according to the network configuration selected)
        - sources should not be set by an input as unavailable / inhibited
        - phase rotation should be ok (if check rotation is selected in the menu)

For source availability the controller is checking as well the loss of the connectors upstream the sensing connection to the phases and the neutral:

- Loss of Neutral: will be detected in all cases except for balanced networks with balanced loads, where is not possible to detect the loss unless the load has a minimum value of unbalance.
- Loss of Phase: will be detected in all cases.

Note: it is not possible to detect a loss of phase or neutral downstream of the controller's connection to the supply to the switching device.

The synoptic on the C66 controller informs the user on the status of the sources:



The round green LED next to S1 or S2 indicates if the source is available or not.

- If the LED is on but not blinking then the source is considered as available.
- If the LED is blinking, the voltage is present but the source is not considered available.
- If the LED is off, then the busbar is dead.

The 2 rectangle green LED indicates the position of the switch.

- If the LED is on, the switch is closed on that position (I or II).
- If the LED is blinking, the controller considers the switch is in that position, but there is no return from the switch (the input has to be configured as a position).
- If the LED is off, the switch is not in that position.

The green LED in the center-up of the diagram indicates if the load is powered.

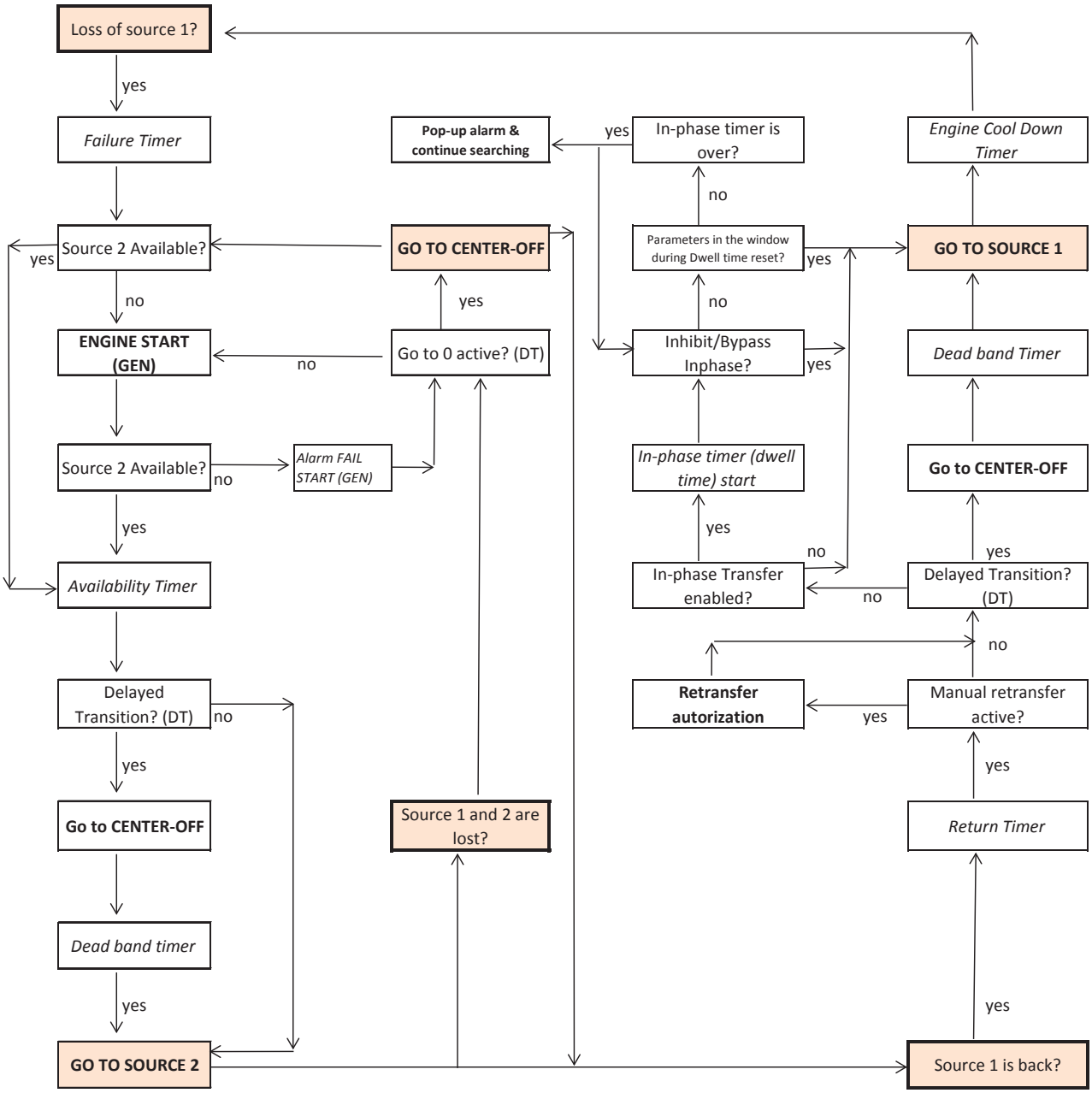
- If the LED is on, the load is supplied by either source 1 or source 2, which means that the source is available and the switch is in one of these positions.
- If the LED is blinking, the load is supplied but a load shedding is taking place.
- If the LED is off, the load is not supplied (switch not closed on an available source).

The “0” amber LED under the load LED indicates the center-off position.

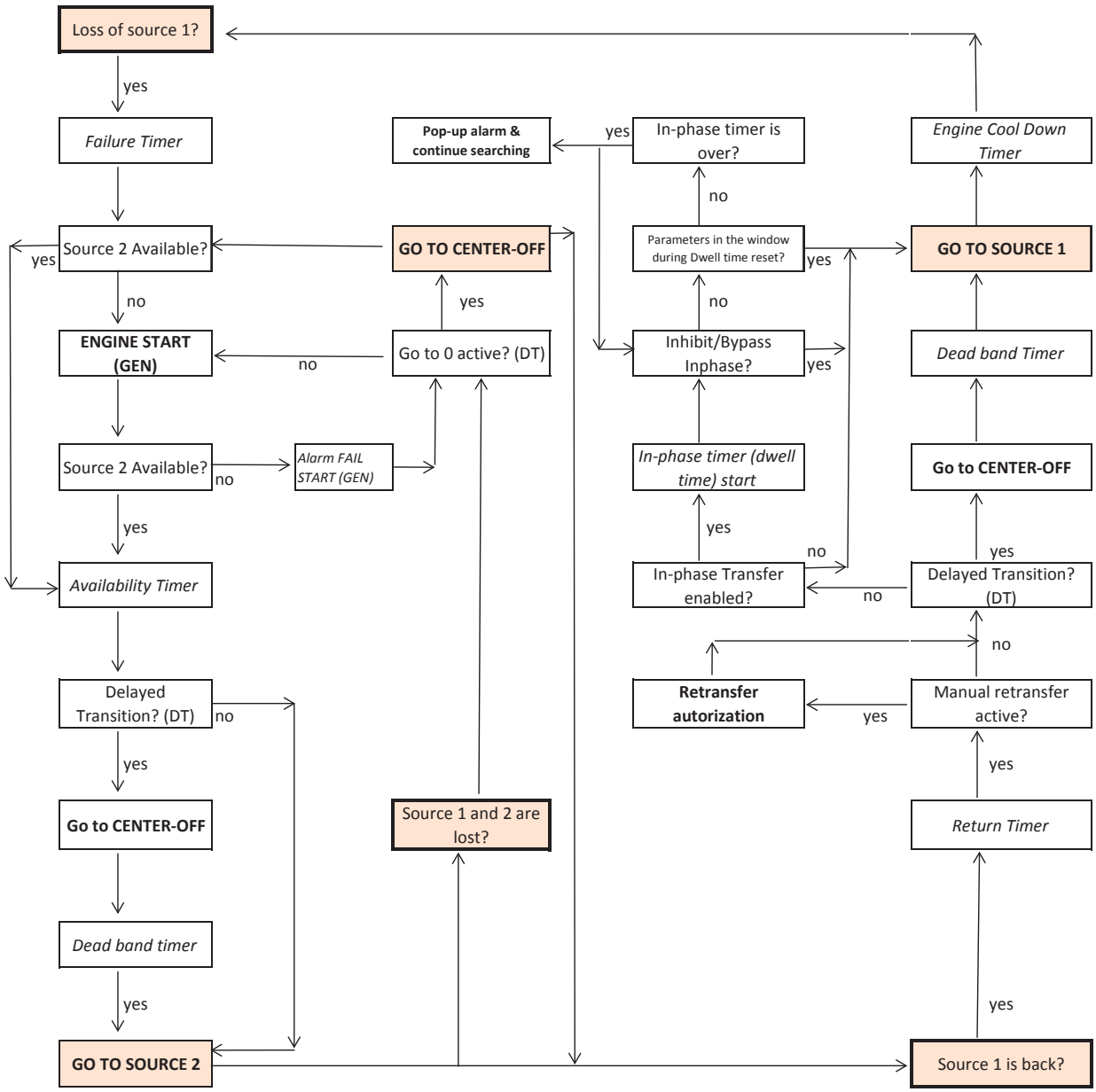
- If the LED is on, the switch is in center-off position (only if there is a 0 poistion)
- If the LED is off, the switch position is either on S1, S2 or unknown (should always be off for technologies without 0 position)
- If the LED is blinking, the controller considers the switch is in that position, but there is no return from the switch (the input has to be configured as 0 position)

10.5. Automatism for Automatic mode

Main-genset applications:



MAIN-MAIN Applications:



10.6. Test operating mode

TEST button on the HMI can be used (by default) to perform a LOAD TEST (as standard) or NO LOAD TEST and can be configured inside the "MAIN MENU" > "PARAMETERS" > "DISPLAY" > "OPTIONS" menu (TEST BUTTON USE).

LOAD TEST: a load test sequence will start by sending a start-gen signal to the secondary source (if in Utility-Gen), and will initiate a transfer to the secondary source, once the test has ended the switch will transfer back to the priority source.

NO LOAD TEST: will start the genset and check that is it correctly started within the configured time, but will not give the order to transfer to the secondary source when it becomes available.

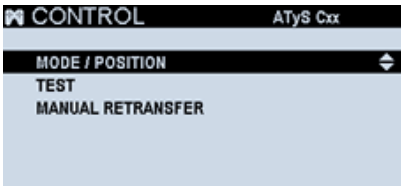
The duration of the tests can be limited (in the configuration) or can be set to Unlimited, when set to unlimited the user will have to press the test button again to stop the tests..

This operation can also be performed with an input, using the EXTERNAL LOAD TEST function.

Note: LOAD TEST will cause a load supply interruption when testing the transfer function as the load will change from one source to another in open transition.

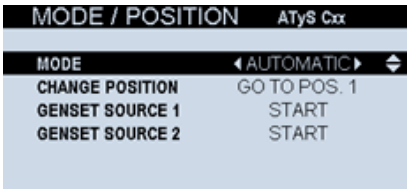
10.7. Control Menu

There are 3 type of commands available in the control menu and all of them require the operator profile password.
Those commands are:



- MODE / POSITION: in the CONTROL menu permits changing the operating mode, changing position and starting/stopping the genset or gensets
  - MODE options: Automatic/Manual/Inhibit:
    - AUTOMATIC: Standard automatic operation of the controller and transfer function. Manual operation through the HMI and through the control menu are inhibited
    - MANUAL: Control of the switch manually either through the menu using the HMI or with push buttons S1 - 0 - S2 which will be activated on the HMI in manual mode.
    - INHIBIT: AUTO functions and manual operation through the HMI menu's will be inhibited until the mode is changed again by the user in the MODE menu or in the Auto/Manu push buttons on the HMI.

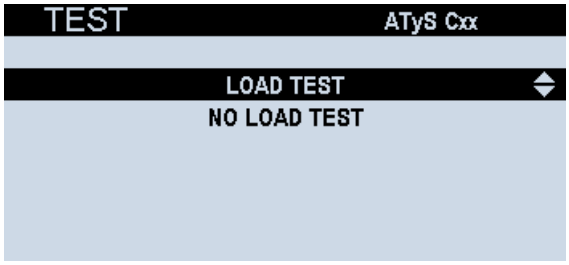
Note: for a total inhibition of the controller including the HMI, the external inhibit inputs must be used.



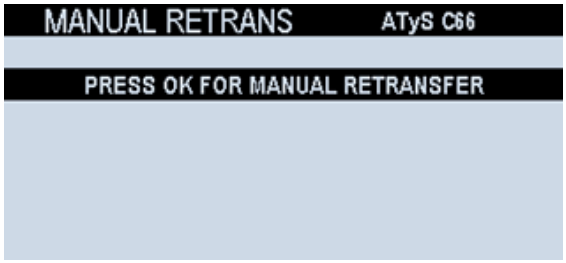
- CHANGE POSITION: (only in CTRL mode) permits sending orders to go to position 1, 0 (center-off) or 2 to the switch device.
- GENSET SOURCE 1/2: permits START or STOP the gensets installed as source 1 or 2.

Note: the CONTROL/ MODE menu is an "order" menu, to activate commands, but it doesn't show the current mode or position (to visualize that the user needs to go to the dashboard screens). Example: mode can be inhibited, but when entering the menu the mode will say "automatic" (which is not the current mode, it's just a list of possible orders to be used.

- TEST: permits launching a LOAD TEST or a NO LOAD TEST. Refer to previous chapter for more details.



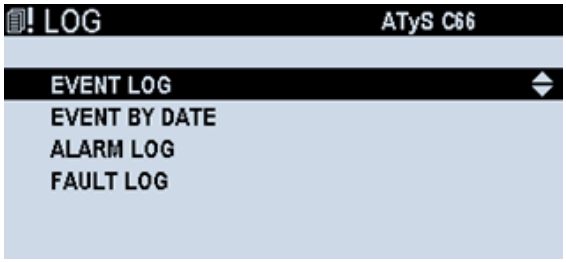
- MANUAL RETRANSFER: when the “manual retransfer” (YES or NO) option is selected in SPECIFIC FUNCTIONS / MANUAL RETRASFER, the user must validate the retransfer directly on the HMI as shown below or alternatively using the programmable external inputs. The retransfer is done by pressing OK and confirming in this screen.



10.8. Log Menu

The LOG menu contains history; register and logs of:
EVENTS (such as operations, timers, mode changes, configuration changes, product status, source availability.)
ALARMS (such as user-selectable alerts) and
FAULT (such as major alerts, not selectable by user and set by default).

All the LOG menu elements are protected by the “operator” password (see chapter 11.1.8).

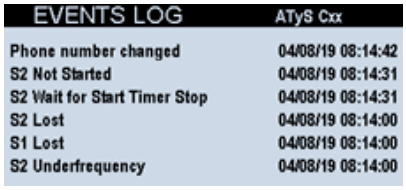


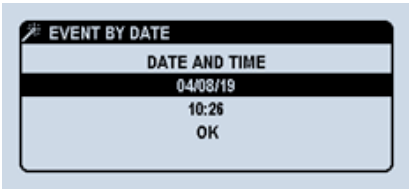
- EVENTS LOG: The controller C66 can store up to 3000 events using FIFO to replace older events when the memory is full.

  The event log will show the information of virtually everything happening in the controller and transfer switch with a timestamp and event description.

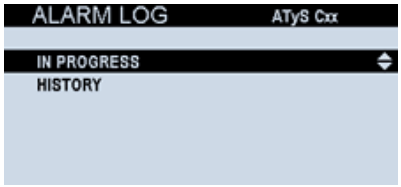
  To navigate through the event log, the UP and DOWN arrows can be used to advance on the event list one by one and the LEFT and RIGHT arrows to advance 6 events every time.

  As the controller can host a large number of registers in the log, the EVENT BY DATE function is a search engine that permits to go directly to a selectable date and time to see targeted events that took place at a specific moment.





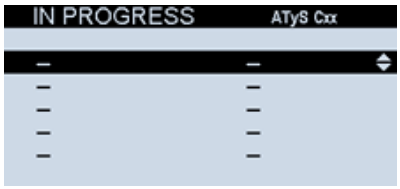
- ALARM LOG: This log can store up to 100 alarms or faults, even if they are in 2 different menus to make it simpler to the user. On the alarm log screen there are 2 options: in progress and history. “In progress” shows all active alarms and the history shows all the last alarms that have ended.

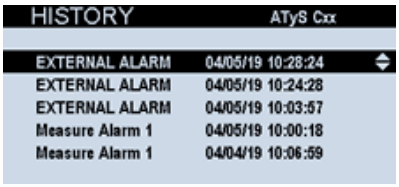


For each alarm, unlike with the events, the details are available, permitting the user to see:

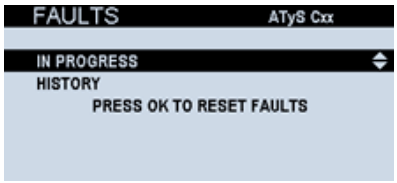
- Type of alarm
- Status
- Starting time and date
- Duration of the alarm active (counter running for active alarms)
- Criticallity of the alarm

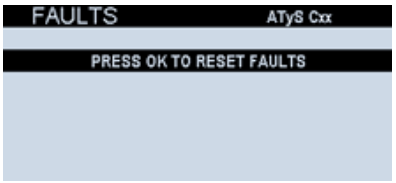
To learn about alarm configuration and options (see chapter 11.1.7).



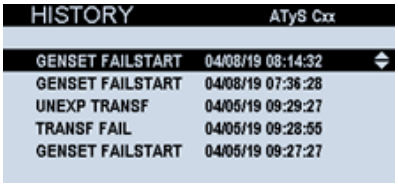


- FAULTS: 100 registers of faults and alarms can be stored inside the internal memory and they are divided into “in progress” and “history”. Faults also permit the reseting of faults using the option “ PRESS OK TO RESET FAULTS” and confirming this on the pop-up that appears on screen.





The information on the history log is the fault description and the time & date when it occurred.



10.9. Statistics menu

This menu gives the value of counters on the following information :

CYCLES: Shows information on duration of operation, number of cycles, number of cycles in automatic mode, number of cycles in manual mode.

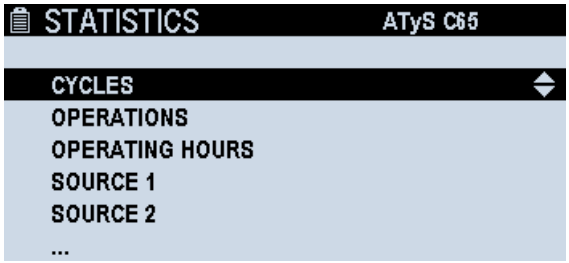
OPERATIONS: Shows the total number of operations as well as the number of operations for each position.

OPERATING HOURS: Shows the total and partial operating hours (partial operating hours can be reset in the maintenance menu).

SOURCE 1/2: Shows the total and partial time spent on the source as well as the time since last operation on the source.

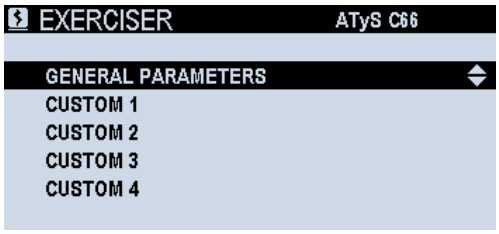
GENSET 1/2: Shows the time the corresponding genset has been running, the number of time the genset has been started and the time the genset spent connected to the load. (If the corresponding source is not configured as a genset the screen will only show “SOURCE 1/2 IS NOT A GENSET”.

BREAKER: Shows the number of trip actions and time since last trip action took place. The switch must be in “CIRCUIT BREAKER” technology to use this menu. Trip actions will only be counted if TRIP BRK1/2 is programmed as an input.



10.10. Engine Exerciser Menu

There are 4 selectable engine exerciser programs that are set in order of priority on the display. That means that the program “CUSTOM 1” is priority over the “CUSTOM 2” in case there is any overlap in the schedule. This is to avoid conflicts such as trying to exercise a genset that is already running. Inside the GENERAL PARAMETERS menu (on the same screen), one can also set a “GENSET IDLE TIMEOUT” time in minutes. This is to avoid exercising a genset that was just running for any other reason. By default this idle time value is set to 168minutes. (If a minimum idle time is not required this timer may be configured by the user as necessary – For example 0minutes).



For each program (CUSTOM 1-4), the following settings can be defined individually:

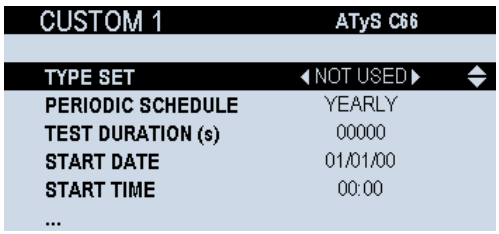
- **Type of test:** type of test that will be performed on this program
  - LOAD TEST: will perform a full LOAD TEST including all the timers and operating the transfer switch (full cycle).

Note: on all switches, a LOAD TEST is done in open transition and will cause a blackout time when testing the transfer function.

  - NO LOAD TEST: will perform a genset start for the defined time, and a genset stop after the configured time elapses.
  - NOT USED: will not perform anything
- **Periodicity Schedule:** every how often will the program take place. It can be set yearly, semi-yearly (every 6 months), bimonthly (every 2 months), monthly, 28 days, biweekly (every 2 weeks), weekly, every 2 days, daily or NON CYCLIC (no repetition, single use).
- **TEST DURATION:** is the time the generator will run with the load before transferring back to priority source (for example, 15minutes).

WARNING ! If using “Manual retransfer” specific function, the transfer to the main source will not take place after this time, but it will wait user validation to retransfer.

- **Starting time&date:** is the date&hour where this periodic program will start (for example, starting on January 5th at 1pm). (date and hour when first TEST will take place)



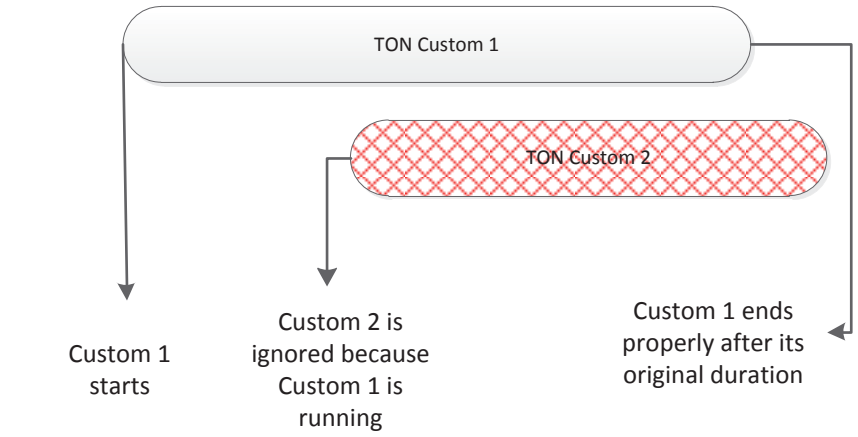
*Example:

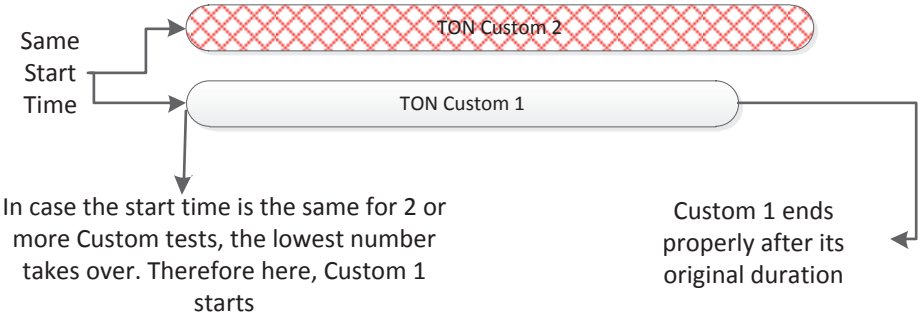
- Type: LOAD TEST
- Periodicity: Monthly
- Test duration: 15min

The exerciser program will do the following:

Exerciser will carry on a full load test (starting genset, counting timers, operating the switch and transferring the load from priority source to alternate source) on Jan 5th at 1pm for 15 minutes. This will be repeated every month at the same time (1pm) for the following months.

In the case of overlapping several exerciser/scheduler programs, the one that is priority (lower custom numbers 1-4) will take precedence. Examples:





11. CONFIGURATION

The configuration on the ATyS C66 can be done:

- Directly on the HMI.
- By USB connection to the controller (using EasyConfig software, available for free download at www.socomec.com)
- Through communication (DIGIWARE or RS485)

Note: the configuration can also be done without powering up the controller through the AC or DC supply and simply using a USB cable connected to a computer USB port or aux battery or power supply such as a telephone charger. The controller will use the USB to power up the screen, buttons and main functions, permitting the configuration through any of these methods.

11.1. Configuration through the display

How to configure the main parameters manually using the display:

PARAMETERS MENU

MAIN MENU / PARAMETERS is accessible after entering the Configurator password (by default 1000) is where all the main parameters of the controller can be configured:

NETWORK – Permits the configuration of the network nominal voltage and frequency, the phase rotation, the type of switch technology, the source priorities, as well as the operating range where the controller will consider a source as available. See chapter 11.1.1.

LOAD – Permits the configuration about the nominal current and the current transformers used for power measurement on the load side of the switch. See chapter 11.1.2.

DISPLAY – Permits selecting the language, setting the date&time and choosing the preferences for the screen and the test button use (“load test” or “no load test”). See chapter 11.1.3.

TIMERS – Permits setting all the different operation timers (used in automatic mode). See chapter 11.1.4.

I/O – Permits the configuration of the Inputs and Outputs of the controller and the external module. See chapter 11.1.5.

COMMUNICATION – Permits the configuration of the communication parameters such as the Modbus address, the baudrate and the use of the RJ45 outputs. See chapter 11.1.6.

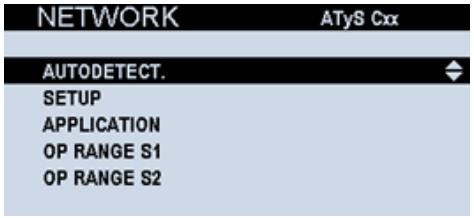
ALARMS – Permits programming different alarm types that can be linked to outputs and will show the information on the screen of the ATyS C66 as well as the webserver. (The webserver is available with M70 or D70 gateways available as an accessory). See chapter 11.1.7.

PASSWORDS – Permits changing the passwords for the different user type levels. See chapter 11.1.8.

Important Note: after finalising the configuration through the HMI, ensure to put the controller in AUTO mode after the configuration is over and the transfer switch and installation are ready to be put in service. (In AUTOMATIC mode)

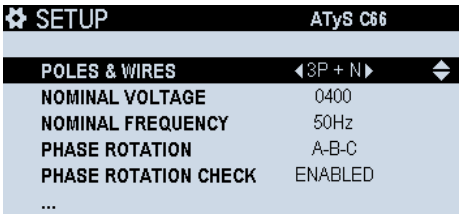
11.1.1. NETWORK parameters menu

The NETWORK menu allows the user with the Configurator profile to configure the installation parameters.
Inside NETWORK, there are 5 different submenus:



AUTODETECT. – When selected the function, a pop-up will show asking for a validation from the user to start autodetecting the network type, the nominal voltage and frequency and the phase rotation. After the autodetection the result can be consulted and modified in the SETUP menu. Information can be consulted on the SETUP menu.

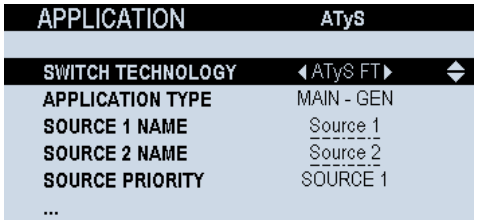
SETUP – Settings concerning the installation can be configured here:



- POLES & WIRES: number of poles and wires. See detail on page "Types of network" inside this chapter
- NOMINAL VOLTAGE
- NOMINAL FREQUENCY
- PHASE ROTATION (ABC or CBA)
- PHASE ROTATION CHECK: this can be enabled or disabled. By default it is enabled but it can be disabled for applications where the user intentionally wants to do so. (Usually only for loads that are not affected by a change in rotation).
- VT USED: (“Used” or “Not used”) When voltage transformers are used for certain applications with V levels above the maximum that the controller can measure directly (ph-ph: 576Vac). Example: 600/480V transformers for 600V Networks. This ratio must be added to the next two lines in parameters “VT primary” and “VT secondary”.
- VT PRIMARY: Voltage of the primary on the voltage transformer used.
- VT SECONDARY: Voltage of the secondary on the voltage transformer used.

⚠ WARNING ! In order to save the settings it’s mandatory to select SAVE CONFIG on the bottom of the screen or press OK button for 1,5s and a pop-up will appear asking for confirmation before “save & exit”.

APPLICATION – Settings concerning the usage of the controller (which type of switch, type of sources, priorities…)



- SWITCH TECHNOLOGY – Type of transfer switching device technology. Options by default are:
  - ATyS FT – (fast transfer) makes reference to Socomec's ATyS FT or equivalent 2 position (I-II) fast transfer switching device or equivalent such as I – II mechanically held power contactors. Selecting this technology activates the in-phase transfer settings and functionality.
  - ATyS DT – (delayed transfer) makes reference to Socomec's ATyS DT, dual operator transfer switch with 3 positions (I-delayed center off-II) switching device or equivalent.
  - ATyS UL makes reference to Socomec type ATyS UL transfer switch or equivalent motorized switch-based three position transfer switch (I – 0 – II).
  - CIRCUIT BREAKER – (MCCB or ACB) makes reference to circuit breakers with 2 positions for each device (ON and OFF), offering the option to have 3 positions when used as a transfer switch (I-0 / 0-II).
  - CONTACTOR – Contactors with 2 electrically held positions per source (ON and OFF). This technology forces the maintained logic for the position order outputs from the controller.

Note:
- To make configuration easier, the controller automatically sets the I/O configuration for position orders and position return feedback from the switch (using preset values) according to the technology that will be set in the controller.
- For safety reasons the change of technology has to be done on Manual mode and requires the configurator profile password.

- APPLICATION TYPE: This setting defines the type of network connected to each source. options are :
  - UTILITY-UTILITY: Select this option when both source 1 and source 2 are connected to transformers, the mains, the utility, a UPS or any other source which does not require a start signal.
  - UTILITY-GENSET: Select this option when using one generator type source (source needing a start signal and/or cooldown sequence), the source linked to the generator will be the secondary source (source which is not set as priority).
  - GENSET-GENSET: Select this option when using two generators type sources (source needing a start signal and/or cooldown sequence).

- SOURCE NAME: user can enter a name for each source. By default "Source 1" and "Source 2"
- SOURCE PRIORITY: Users can use this option to select which should be the preferred source (controller will prioritize this source when available) this can be set to:
  - SOURCE 1: When source 1 is available and the controller is in automatic mode it will transfer to this source, in UTILITY-GENSET application the generator will be linked to source 2.
  - SOURCE 2: When source 2 is available and the controller is in automatic mode will transfer to this source, in UTILITY-GENSET application the generator will be linked to source 1.
  - NO PRIORITY: When this option is used the controller will not change source in automatic mode unless the current connected source is lost. This option is not available in UTILITY-GENSET mode.

- LOGIC: These settings will allow users to define the duration of the closing of outputs linked to RTSE orders (CLOSE BREAKER, OPEN BREAKER, GO TO POS). This modulates the impulse duration of the electrical signal sent to the RTSE used to control it.
  Other settings in this menu will act on the repetition and frequency of this signal. Users can configure the following :
  - IMPULSE: The output from the controller will close for a short period of time, creating a pulsed signal with a defined duration to the switch to change position (settings for pulse duration, number of retries can be configured in APPLICATION).
  - SMART IMPULSE: The impulse will be maintained until the switch has reached the requested position or the duration set in “PULSE LENGTH” has elapsed (whichever comes first). If this option is selected there will be no retries if the switching fails. This option can be used to limit the impulse duration for RTSE which do not indicate the minimum pulse duration needed to confirm position orders.
  - CONTACT: (Maintained) The output from the controller will close and stay closed indefinitely as long as the switch is requested to stay in a position. This logic is used mainly with contactors but in some cases can also be used with breakers and class PC switches that accept it. For example when switching to the source 2 the output “POS 2 ORDER” will be closed (active) until the next transfer, then either “POS 1 ORDER” will be active to switch to source 1 or both position orders will be inactive to switch to the position 0 (center off / isolated).

- (EXT) LOAD TEST PRIO (yes/no): these two options allow users to prioritize tests over the loss of sources. When a test is taking place if the tested source is lost the test will keep going until the tests timers have elapsed. By default both of these settings are set to “NO” (disabled).

Note: if the test timer is set to Unlimited, the switch will remain in test until the user ends the test.

RETRY NUMBER: This setting is available with IMPULSE logic only. Users can choose to send the position order a number of times (0-10), if the position is not reached after a first pulse of position order the controller will send the position order again (retry). After all retries have occurred if the intended position is still not reached the controller will detect this as a "FAILED TO TRANSFER" fault. If this value is set to 0 the controller will only send a single pulse when giving position orders. Once the requested position is reached retries will stop even if there are remaining retries available. By default this value is set to 3.

RETRY DELAY: Can be adjusted from 600 to10000ms. It defines time interval between each retry. Minimum is always pulse length + 500ms, this delay starts counting at the beginning of the impulse. By default this value is set to 1000ms.

PULSE LENGTH: Can be adjusted from 100 to 5000ms. It defines the duration of the pulse (only for IMPULSE mode). Indicates max pulse length in SMART IMPULSE mode. By default this value is set to 100ms.).

Note: in order to save the settings it’s mandatory to select SAVE CONFIG on the bottom of the screen or press OK button for 1.5s and a pop-up will appear asking for confirmation before “save & exit”.

OP RANGE S1 and S2 – Permits setting the limits of acceptability for the sources 1 and 2 respectively.

OP RANGE S1	ATyS Cxx
S1 OV FAIL (%)	115
S1 OV RESTORE (%)	110
S1 UV FAIL (%)	85
S1 UV RESTORE (%)	95
S1 UB FAIL (%)	00
...	

OP RANGE S2	ATyS Cxx
S2 OV FAIL (%)	115
S2 OV RESTORE (%)	110
S2 UV FAIL (%)	85
S2 UV RESTORE (%)	95
S2 UB FAIL (%)	00
...	

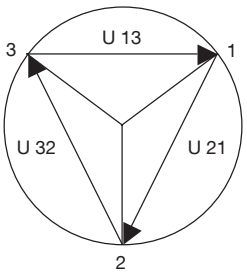
OV= overvoltage

UV= undervoltage

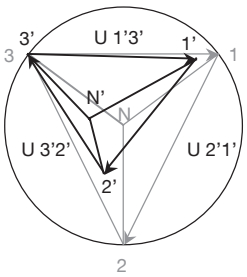
OF = overfrequency

UF = underfrequency

UB = unbalance



Balanced network

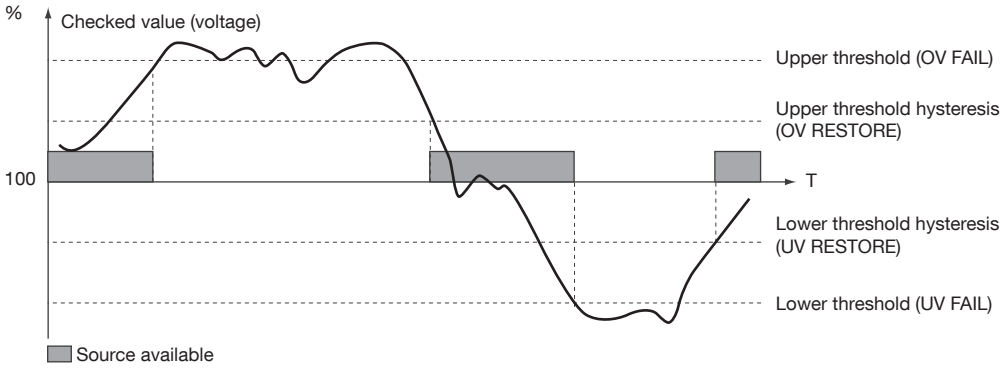


Unbalanced network

For each parameter, the limits can be set in % of the nominal value (for both voltage and frequency).

There are four parameters to set: the threshold values (upper and lower) that will make the source be considered unavailable (FAIL) and the hysteresis values (upper and lower)that will make the source be considered available again (RESTORE).

The thresholds and hystereses are defined as percentages of nominal voltage.
The hystereses define return to normal levels following an under-voltage or over-voltage.



Note In order to save the settings it's mandatory to select SAVE CONFIG on the bottom of the screen or press OK button for 1.5s and a pop-up will appear asking for confirmation before "save & exit".

	Definition	** Adjustment Range	Default value
OV FAIL 115%	Overvoltage threshold: Source Supply 1	102 – 130%	115%
OV RESTORE 110%	Over-voltage hysteresis: Supply 1	101 – 129%	110%
UV FAIL 085%	Undervoltage threshold: Supply 1	60 – 98%	85%
UV RESTORE 095%	Undervoltage hysteresis: Supply 1	61 – 99%	95%
UB FAIL 000%	Phase unbalance threshold: Supply 1 Refer to next paragragh for further details	0 – 30%	0%
UB RESTORE 000%	Hysteresis unbalance threshold: Supply 1 Refer to next paragragh for further details	0 – 29%	0%
OF FAIL 105%	Over Frequency Threshold: Source 1	102 – 130%	105%
OF RESTORE 103%	Over Frequency Hysteresis: Source 1	101 – 129%	103%
UF FAIL 095%	Under Frequency Threshold: Source 1	60 – 98%	95%
UF RESTORE 097%	Under Frequency Hysteresis: Source 1	61 – 99%	97%

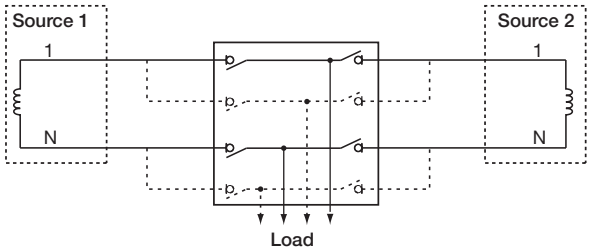
** Adjustment range given:

- As a % of U nominal for Over and Undervoltage
- As a % of U avg in case of unbalances.
- As a % of nominal frequency

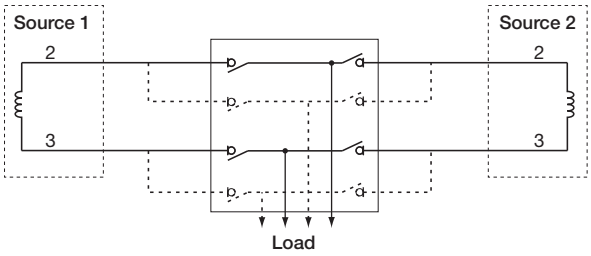
Note: in order to save the settings it's mandatory to select SAVE CONFIG on the bottom of the screen or press OK button for 1.5s and a pop-up will appear asking for confirmation before "save & exit".

Types of Network

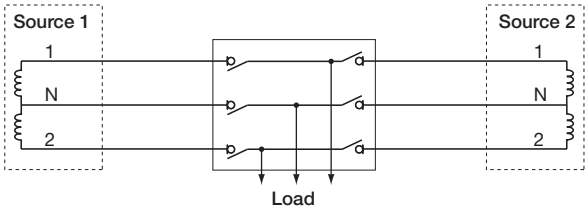
1P+N Single phase network



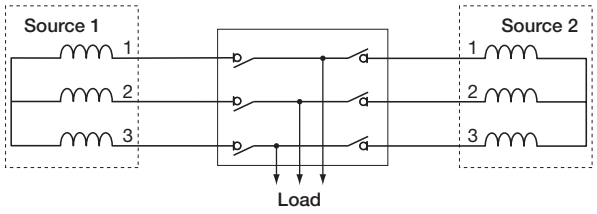
2P Two phase network without neutral



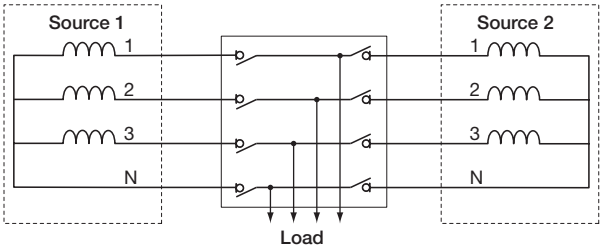
2P+N Two phase network with neutral



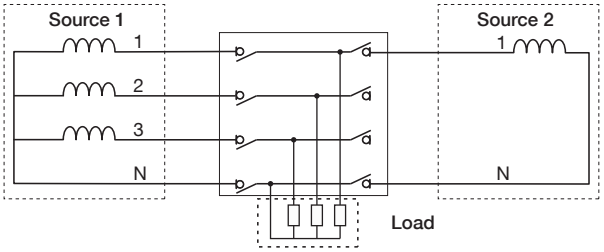
3P Three phase network without neutral



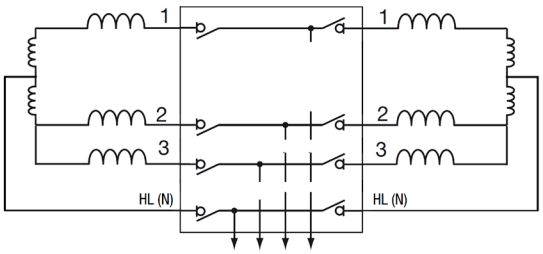
3P+N Three phase network with neutral



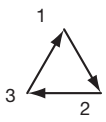
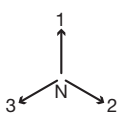
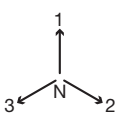
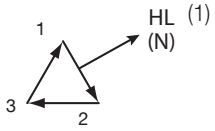
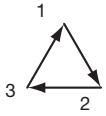
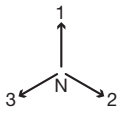
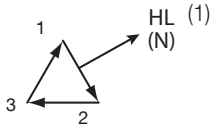
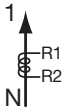
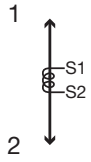
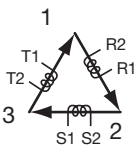
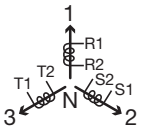
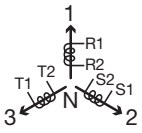
3P+N Source 1: Three phase network with neutral
1P+N Source 2: Single phase network with neutral



3P+HL Three phase network with neutral



Metering and sensing details

Network type							
	1P	**2 P**	**2P+N**	**3P**	**3P+N**	**3P+N / 1P+N**	**3P+HL (only C65)**
Source 1	1 phase 2 wire	2 phase 2 wire	2 phase 3 wire	3 phase 3 wire	3 phase 4 wire	3 phase 4 wire	3 phase 4 wire
Source 2						1 phase 2 wire	
Source 1							
Source 2							
CT cabling (load side)							User choice
Voltage sensing							
Source 1	- V1	U12	U12 V1, V2	U12, U23, U31	U12, U23, U31 V1, V2, V3	U12, U23, U31 V1, V2, V3	U12, U23, U31, V1 (1-HL), V2 (2-HL), V3 (3-HL)
Source 2	- V1	U12 -	U12 V1, V2	U12, U23, U31 -	U12, U23, U31 V1, V2, V3	- V1	U12, U23, U31, V1 (1-HL), V2 (2-HL), V3 (3-HL)
Source presence (source available)	✔	✔	✔	✔	✔	✔	✔
Source in ranges (U, V, F)	✔	✔	✔	✔	✔	✔	✔
Rotation phase order	-	-	-	✔	✔	S1 only	✔
Voltage unbalanced is lower than threshold	-	-	-	✔	✔	S1 only	✔
Metering applicable to ATyS C65 ONLY							
If CT connected (load side)	- - - PT, QT, ST, PFT	- - - PT, QT, ST, PFT	P1, Q1, S1, PF1 P2, Q2, S2, PF2 - PT, QT, ST, PFT I1, I2	P1, Q1, S1, PF1 P2, Q2, S2, PF2 P3, Q3, S3, PF3 PT, QT, ST, PFT I1, I2, I3	P1, Q1, S1, PF1 P2, Q2, S2, PF2 P3, Q3, S3, PF3 PT, QT, ST, PFT I1, I2, I3, In	P1, Q1, S1, PF1* P2, Q2, S2, PF2 P3, Q3, S3, PF3 PT, QT, ST, PFT I1, I2, I3, In	P1, Q1, S1, PF1* P2, Q2, S2, PF2 P3, Q3, S3, PF3 PT, QT, ST, PFT I1, I2, I3, In

(1) High leg (Neutral) must be between phase 1 and 2.

11.1.2. LOAD parameters menu

This menu allows users to configure settings linked to the current, and power measurement of the load. Options include :

LOAD STATUS: Users can choose “ENABLED” or “DISABLED” for information linked to current measurement. If this option is set to “DISABLED” the dashboards information that use current measurement are hidden (“POWER & ENERGY”, “I”, “Isys”, etc..). By default this setting is set to ENABLED (if this settings is enabled but no CTs (Current Transformers) are installed all current linked values will be shown at 0).

LOAD TYPE: This setting allows users to define the type of network on the load side and the number of CT used to measure the current. Based on the number of CT used the controller will calculate any wires not monitored:

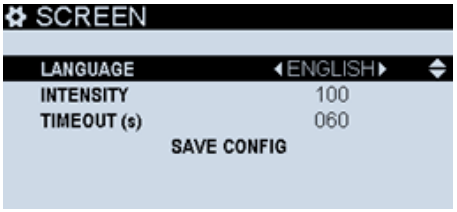
Network Type	LOAD TYPE	Position of CT's	NOTES
1P+N	1P+N_1 CT	On L1	Standard solution. Calculated neutral.
2P	2P_1 CT	On L1	Standard solution.
2P+N	2P+N_2 CT	On L1 and L2	Standard solution. Calculated neutral.
3P	3P_3 CT	On L1, L2 and L3	Standard solution.
	3P_2 CT	On L1 and L2	Accuracy reduced by 0,5%. Calculated L3.
	3P_1 CT	On L1	Only for balanced loads
3P+N	3P+N 4 CT	On L1, L2, L3 and N	Maximum accuracy. Measured Neutral.
	3P+N 3 CT	On L1, L2 and L3	Standard solution. Calculated neutral.
	3P+N 1 CT	On L1	Only for balanced loads.
3P+HL	User choice	User choice	Standard solution.
3P+N/1P+N	3P+N 4 CT	On L1, L2, L3 and N	Maximum accuracy. Measured Neutral.
	3P+N 3 CT	On L1, L2 and L3	Standard solution. Calculated neutral.
	3P+N 1 CT	On L1	Only for 1ph loads (from S2).

- Inom: nominal current for the loads
- LOAD NAME: name of the load group of the transfer switch (for example to be used on the webserver)
- CT PRIMARY and SECONDARY: transformation ratio of the current transformers. For the secondary the options are either 5A or 1A.
- NEUTRAL CT PRIMARY and SECONDARY: As the neutral current transformer can have different sizing, it can be selected independently. The secondary has to be either 5A or 1A.
- CT PHASE A,B,C or NEUTRAL POLARITY:: sets the direction of the current transformer. For example, if the current transformers have been installed in the opposite direction, with this function it can be inverted by software, avoiding to physically turning the transformers

11.1.3. DISPLAY parameters menu

The PARAMETERS / DISPLAY menu allows to set the main parameters for the HMI.

- SCREEN PARAMETERS:



LANGUAGE: This will change the language of the texts on dashboards, timers, faults and menus.

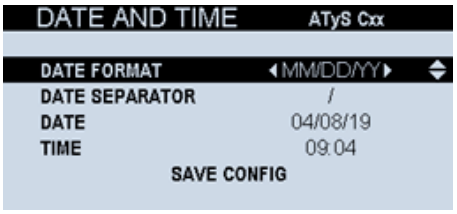
Languages available:

- English
- French
- Spanish

INTENSITY: This will change the brightness of the screen back light.

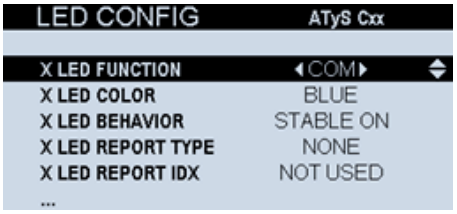
TIMEOUT: This sets the time in seconds before the screen back light is turned off (this timer resets whenever a button is pressed, or an pop-up appears on the screen). Default value is 60 seconds.

- DATE AND TIME PARAMETERS:



Date and time will remain running thanks to the RTC battery even if all sources are off. However users can modify the date and date format using this menu.

- LED CONFIG:



This menu allows users to configure the X and Y LED (left side of the HMI) functioning mode.

X/Y LED FUNCTION: There are several functions that can be chosen:

- ALWAYS ON: LED permanently on.
- BUTTON RESPONSE: Every time a button is pressed it will become active (blink only).
- COM: communication report (active when communicating through RS485)
- SCHEDULER/EXERCISER ACTIVE: ON while the Engine Exerciser / Genset Scheduler is active (any of the programs)
- INPUT REPORT: On when the selected input is active.
- OUTPUT REPORT: On when the selected output is active.
- NOT IN AUTO: On when the product is not in automatic mode (manual, inhibited, fault…).
- INHIBIT MODE: On when the controller has been inhibited.
- LOAD SHED ACTIVE: On when load shedding (forced or smart) active.
- GENSET COOLDOWN: On while cooldown timer is running (genset is cooling down before being turned off).
- ELEVATOR: ELEVATOR output signal is active.
- TRANSF ONGOING: Transfer is taking place (it counts from detection/request of transfer to transfer finalized, position reached).
- MAINTEN. ALARMS: LED will be active when a maintenance alarm is ongoing.
- SERVICE: LED will be active when servicing is needed on the A TS system (based on the configured time between inspection).
- NONE: LED not used.

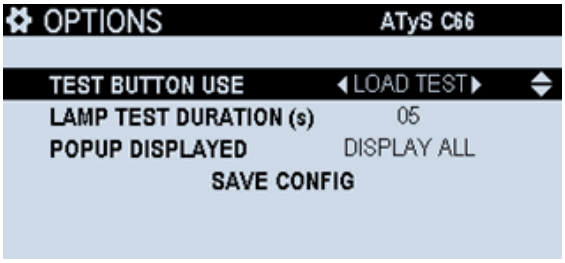
COLOR: Users can choose between Blue or Yellow for the color of each X & Y LED.

BEHAVIOR: Users can choose the behavior of the LED when the function linked to it is active. The LEDs can be set to STABLE ON (the LED will be active as long as the linked function is active) or BLINK (the LED will be blinking at a frequency of 1Hz).

REPORT TYPE: This setting is available only when the “LED FUNCTIONS” has been set to “INPUT REPORT” or “OUTPUT REPORT”. This option alows users to choose between an INTERNAL input/output (input/output on the controller itself) or “I/O MODULE X” input/output (input/output linked to an I/O module).

REPORT IDX: This setting is available only when the “LED FUNCTIONS” has been set to “INPUT REPORT” or “OUTPUT REPORT”. This option selects the input or output number to report.

- OPTIONS for the HMI buttons



- TEST button use (between LOAD or NO LOAD test)
- LAMP TEST duration (s): This will allow the user to change the duration of the lamp test button available on the HMI. The lamp test will start after the button is pressed and the user can end the lamp test at any time by pressing the button again before this time limit.
- POPUP DISPLAY: Users can choose which pop-up will be shown on the screen. The default and recommended setting is "DISPLAY ALL" which will show all pop-up indications.
- Users can also chose to hide alarms "HIDE ALARM" (this will apply to alarms only not faults), hide the timer pop-up "HIDE TIMER", or hide both timers and alarms "HIDE ALARM & TIMER (this will apply to alarms and timers only not fault pop-ups).

WARNING! If users choose to hide timer pop-ups, bypassing timers using the input BYPASS TIMER or using the modbus command will not be functional (in this case timers can be bypassed only through the TIMER dashboard).

(i) If users choose to hide timers, the AUTO LED (or MANUAL LED if product is in manual) will be blinking if a timer is counting.

- CHANGE PRODUCT NAME: Users can change the name of the ATS. This information will appear on all the dashboards and menus on the top-right of the screen. To change the name select this menu and press “OK” again, a keyboard will appear in order to select the new name. By default the name of the controller is “ATyS C66”. The new controller name is limited to 31 characters.

- SCREENSAVER TEXT: User can replace the default Socomec logo on the home screen by 4 lines of personalized text. This can be useful to promote the brand, the loads or installation connected or provide maintenance team with information. This menu is divided into the following settings:

- TEXT POLICE: Users can choose size of the text (by default ARIAL 12) options are ARIAL 12 Light, 12, 16, 16 BOLD and 40. Using a larger font size will limit the amount of characters and line that can be used.

- LINE 1-4 TEXT: To change a line of text select the text line to change and press the “OK” button, a keyboard will appear and prompt users to enter the text. The number of characters that can be inserted in a line will change depending on the TEXT POLICE.

- PREVIEW: When this menu is selected press the “OK” button to preview the result of the text inserted. To save the results stay pressed on the “OK” button for 1.5s or press “OK” when “SAVE CONFIG” is highlighted.

- DEFAULT LOGO: Press the “OK” button when this option is selected to return the to the default HOMO logo (Socomec logo).

11.1.4. TIMERS parameters menu

All the operational timers can be set on this menu. They are up to 26 general timers split into 4 groups:

Note: the specific functions with timers are not included in this chapter. Consult the Timers Annex in chapter 13.2 to have the full list.

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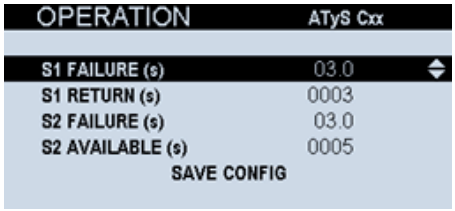
- OPERATION



S1/S2 FAILURE TIMER (s): This timer defines the time it takes to consider the source as lost.

This timer will start counting when source 1/2 is outside the voltage or frequency thresholds (or phase rotation is changed). If the source returns within the hysteresis limits before the timer ends the source will not be considered as lost. This timer will fully reset when the source 1/2 returns within the hysteresis settings value for the full duration of the “S1/S2 RETURN TIMER”. If source fall outsides the voltage or frequency thresholds before the “S1/S2 FAILURE TIMER” is fully reset this timer will resume countdown based on its previous value.

At the end of this timer, the controller will initiate the transfer sequence to the opposite source if it is available, or will send the generator start signal if the opposite source is a generator.

In case of complete power loss (the controller is not powered by source 1, source 2, 24 VDC or usb), this timer will still be taken into account before starting the generator, this is limited to 60s max, after 60s of complete power loss the generator start signal will be sent regardless of this settings.

After a reboot (when the controller turns on after the power returns), if the source is not available within the first 3s the corresponding source timer S1/S2 FAILURE TIMER will be considered as elapsed.

By default this timer is set to 3s, it can be configured from 0000.0s up to 6500.0s by increments of 0.1s.

S1/S2 RETURN TIMER (s): This timer defines the it takes for a source to be considered available. This timer is available only if the corresponding source configured to a “MAINS” (transformer).

This timer will start counting when the source 1/2 returns within the hysteresis setting range (voltage and frequency is within hysteresis range and phase rotation is correct).

At the end of the timer the corresponding source will be considered as available, if this source is the only available source or the priority source the controller will initiate the transfer sequence to this source.

By default the “RETURN TIMER” is set to 180s, this timer can be configured from 0s up to 9999s.

Note: if the “DYNAMIC RETURN” specific function is enabled (by default this is the case). If the priority source is within hysteresis settings and it is the only source considered as available if the “DYNAMIC RETURN TIMER” is shorter than the “SOURCE RETURN TIMER”, the “DYNAMIC RETURN TIMER” will bypass the return timer and initiate a transfer to the priority source when it has elapsed.

S1/S2 AVAILABLE TIMER (s): This timer defines the time it takes for a generator to be considered as available once it has reached the configured voltage and frequency parameters. This setting is available only if the corresponding source is set to GEN (generator).

This timer will start counting when the source 1/2 returns within the hysteresis setting range (voltage and frequency is within hysteresis range and phase rotation is correct).

At the end of the timer the corresponding source will be considered as available, after this timer is over, if this source is the only available source or the priority source, the controller will initiate the transfer sequence to this source.

By default the “AVAILABLE TIMER” is set to 5s, this timer can be configured from 0s up to 9999s by increments of 1s.

S1 DEAD BAND (s): This timer is available on the C65 only and only for switching technology with a 0 position or center off position. It defines the time that the load must spend without voltage before transferring from source 1 to source 2.

This timer starts counting when the load voltage is <50VAC, if the source 1 voltage is lost (<50VAC) this timer will start counting when the ATSE is still connected to source 1 simultaneously with the “S1 FAIL TIMER”. If the source 1 is outside thresholds but not completely lost (>50VAC) then this timer will start counting when the ATSE is in position 0 (center off) and will stay in this position until it is fully elapsed. Once this timer is over connection to source 2 will be authorized.

By default this value is set to 0003.0s and can be configured from 0000.0s up to 6500.0s by increments of 0.1s.

S2 DEAD BAND (s): This timer is available on the C65 only and only for switching technology with a 0 position or center off position. It defines the time that the load must spend without voltage before transferring from source 2 to source 1.

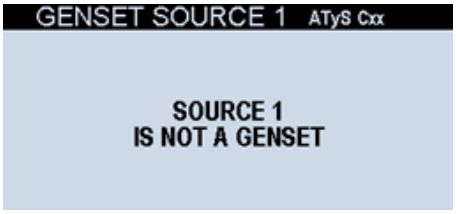
This timer starts counting when the load voltage is <50VAC, if the source 2 voltage is lost (<50VAC) this timer will start counting when the ATSE is still connected to source 2 simultaneously with the “S2 FAIL TIMER”. If the source 2 is outside thresholds but not completely lost (>50VAC) then this timer will start counting when the ATSE is in position 0 (center off) and will stay in this position until it is fully elapsed. Once this timer is over connection to source 1 will be authorized.

By default this value is set to 0003.0s and can be configured from 0000.0s up to 6500.0s by increments of 0.1s.

- GENSET SOURCE 1/2

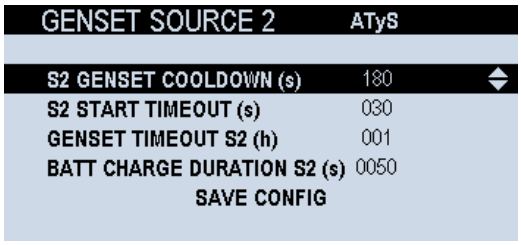
This menu contains all generator related timers. This menu is available for the corresponding source when it is linked to a generator.

Note: if the source is not linked to a genset the following message will be shown: [IMAGE SOURCE 1 IS NOT A GENSET].



If the source is not linked to a generator, verify that the application is set to UTILITY-GEN or GEN-GEN and if the application is set to UTILITY-GEN check that the current source is not the priority source.

Each source timer menu contains the following timers:



- GENSET COOLDOWN (s): This timer will count down once the load leaves the source with a genset, when this timer expires the genset start signal linked to this source will be deactivated. This timer allows user to keep the generator running a set period of time off load in order to give it time to cool down after changing source. By default this timer is set to 180s, the configuration range is from 0000 up to 9999s.
- START TIMEOUT (s): Maximum time for the genset to start. The generator voltage, frequency and phase rotation must be within the set parameters for the duration of the “S1/S2 AVAILABLE TIMER” before this timer ends. If the “START TIMEOUT” ends before the “S1/S2 AVAILABLE TIMER”, the controller will signal a “GENSET FAIL TO START” fault. By default this timer is set to 30s, the configuration range is from 1s to 600s.

The “START TIMEOUT” timer must be greater than the source "AVAILABLE TIMER" or the genset will always be considered as fail to start.

Note: GENSET TIMEOUT (h) and BATT CHARGE DURATION are both linked the output "BATTERY CHARGER".

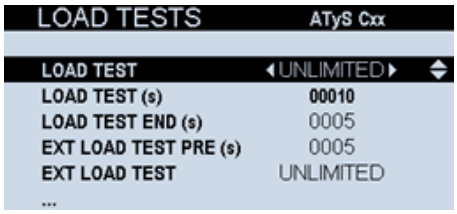
- GENSET TIMEOUT (h): The purpose of this timer is to make sure that if the generator is turned off for long period of time the generator internal battery is not depleted. This timer will start when the genset is off, when this timer ends the BATTERY CHARGER output will be activated, this output can be linked to a battery charger. This timer will reset if the genset is on for the duration of BATT CHARGE DURATION, or if the output "BATTERY CHARGER" is activated for the duration of BATT CHARGE DURATION. By default this timer is set to 168h (7 days), the configuration range is from 0h to 168h.
- BATT CHARGE DURATION (s): (Only available on C65) This timer represents the time needed to fully charge the generator battery. The timer will count down when the "BATTERY CHARGER" output is active or when the genset is available. The end of this timer will reset the GENSET TIMEOUT TIMER. By default this timer is set to 1800s, the configuration range is from 1s to 9999s.

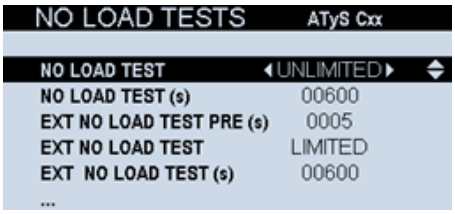
In GEN-GEN The "GENSET TIMEOUT" and "BATT CHARGE DURATION" timers as well as the "BATTERY CHARGER" output will apply only to the secondary genset.

- LOAD & NO LOAD TESTS

These two menus contains the timers linked to the test features. The following settings can be configured:

- ON/OFF LOAD TEST (limited or unlimited) Limited means there is a defined test time and it will perform the changeover and the comeback to the prioritary source. Unlimited will require the acceptance from the user to comeback to prioritary source. Otherwise, it will stay in secondary source waiting confirmation unless the secondary source is lost and prioritary one is available, in that case it will transfer and end the test automatically (except if the option TEST PRIO has been selected on the NETWORK/APPLICATION menu).





- LOAD TEST TYPE: Users can choose if a test on/off load is “LIMITED” or “UNLIMITED”. If “LIMITED” is selected once started, the test procedure will follow the configured timer and end automatically (unless the function manual retransfer is activated). If “UNLIMITED” is selected the test will stay active (ATSE connected to the non priority generator source for LOAD TEST, or generator running for NO LOAD TEST) until users stop the test manually (using the HMI pushbutton, programmable input or communications). By default this setting is set to UNLIMITED.
- LOAD / NO LOAD TEST DURATION (s): This timer is active only if “LIMITED” has been selected on the previous option (LOAD TEST TYPE). It defines the duration of the test, this timer starts counting as soon as the test is started (this timer will start counting before the ATSE connected to the generator). By default this setting is set to 10s, the configuration range is from 0s to 21600s.
- LOAD / NO LOAD TEST END (s): (Only for LOAD TEST, is not applicable for NO LOAD TEST) This timer defines the time to stay connected on the secondary source after the test has ended. This timer will start counting after the “LOAD TEST DURATION” has fully elapsed. The default value for this setting is 5s can be configured from 0s to 1800s..
- EXT. LOAD / NO LOAD TEST PRE (s): The external load / no load test will start at the end of this timer (start the generator and change position). This timer is taken into account even if the EXT. LOAD TEST is UNLIMITED. The default value for this setting is 5s can be configured from 0s to 1800s.

EXT LOAD / NO LOAD TEST TYPE: Similarly to the parameter in LOAD / NO LOAD TEST TYPE, this defines if the type of test (limited or unlimited) when starting and external load test (load test activated using "EXT. LOAD TEST" or "EXT. NO LOAD TEST" inputs or communication).

EXT. LOAD / NO LOAD TEST POST (s): This timer defines the time to stay connected on the secondary source after the test has ended. This timer will start counting after the “LOAD TEST DURATION” has fully elapsed. The default value for this setting is 5s can be configured from 0s to 1800s.

Note: when programmed on an INPUT, tests sequence will start on the rising edge of the input (when the input is activated), if the test is set to “LIMITED” the test countdown timers will start on the falling edge of the input (when the input is deactivated). It is therefore recommended to use pushbuttons rather than selector switches for test functions programmed to “LIMITED”.

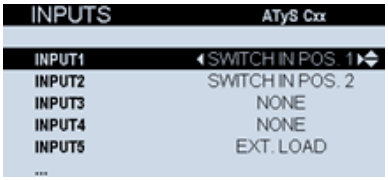
11.1.5. I/O

This menu contains all the parameters for inputs and outputs. By default, the controller has 6 inputs and 6 outputs on the controller (called internal Inputs / Outputs) and up to 6 optional I/O 10 modules with 4in/2out can be added (only C65) achieving up to 30 inputs and 18 outputs total.

11.1.5.1. Inputs

This menu allows users to select the input functions for all internal inputs 1-6, the “INPUT TYPE” parameter allows users to change the logic from “NO” (normally open the default value, input is active when contact with common point is closed) to “NC” (normally closed, input is active when the contact with the common point is open).

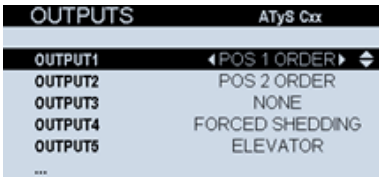
The default value of the Inputs will vary depending on the “SWITCH TECHNOLOGY” used in the “APPLICATION” menu.



11.1.5.2. Outputs

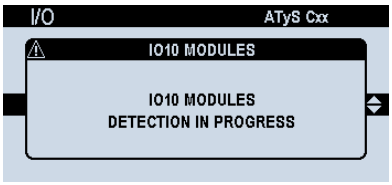
This menu allows users to select the output functions for all internal inputs 1-6, the “OUTPUT TYPE” parameter allows users to change the logic from “NO” (normally closed the default value, active when contact with common point is closed) to “NO” (normally closed, active when the contact with the common point is open).

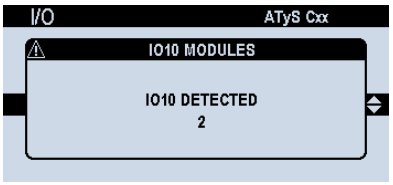
The default value of the outputs will vary depending on the “SWITCH TECHNOLOGY” used in the “APPLICATION” menu.



11.1.5.3. External I/O detection

Press the “OK” on this menu to start detecting connected I/O modules. A Pop-up will signal the start and end of the IO module detection as well as the number of I/O modules detected, this detection can take a few minutes to complete.



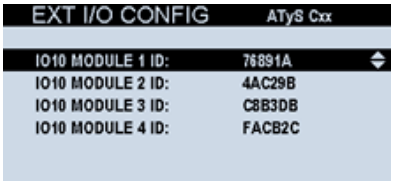


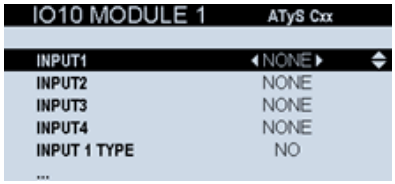
If the “OK” or “Return” button is pressed the pop-up message will be cleared but the detection will still be ongoing.

Note: I/O module detection and I/O module configuration will not be functional if in the “COMMUNICATION”>”DIGIWARE MODE” the controller is not set to “MASTER OVER I/O”.

11.1.5.4. External I/O config

This menu allows users to configure the input and output functions of the I/O modules. The first window “EXT I/O CONFIG” will list the I/O module detected, each module will be linked to a number and identifiable using it’s ID.





To configure the Inputs and outputs select the module to configure and press “OK”. Users will then be able to change the 4 input functions, the 4 input type, the 2 output function and 2 output type.

Note: Inputs and outputs which are needed to control and receive the position of the RTSE cannot be used on external I/O modules.

Note: the specific functions that are related to the I/O might require some settings to be configured on the SPECIFIC FUNCTIONS menu. Consult the I/O Annex 16 - 3, page 105104 and Annex 16 - 4, page 107106 to have the full list of functions to be configured on the I/O.

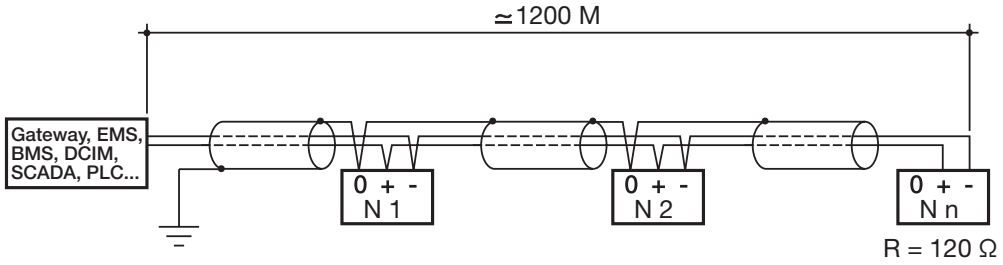
Warning! after each menu configuration do not forget to save by pressing "SAVE CONFIG" or pressing the "OK" button for at least 1.5 seconds.

11.1.6. COMMUNICATION parameters menu

RS485

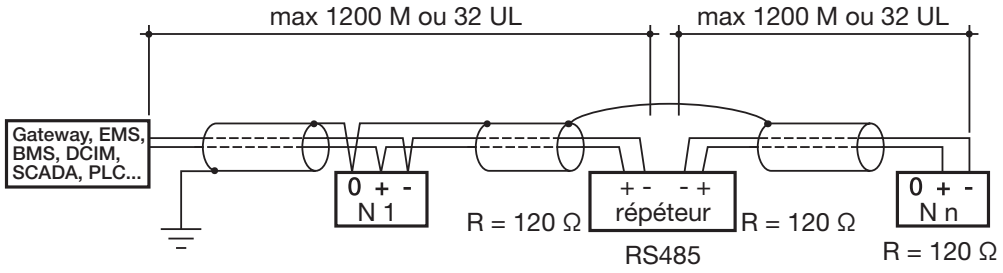
The MODBUS RTU protocol available on the ATyS C66 communicates via an RS485 series link (2 or 3 wires) which is used to operate, configure or read parameters from a PC or an API.

In a standard configuration, a RS485 connection is used to connect 32 products to a PC or a controller up to 1200metres (1300yds) far.



A LIYCY shielded twisted pair must be used. We recommend using a shielded twisted pair with a general LIYCY-CY shielding in a environment where there is interference or in a very long network with a number of products.
If the distance of1200 m is exeeded and/or the number of products is greater than 32, a repeater must be added to enable additional products to be connected.

A 120 Ohm resistor must be fixed at both ends of the connection.



Communication tables: can be found on the website at the following address:
www.socomec.com

Digiware

The product offers the option to choose between controlling external I/O expansion modules through the RJ45 connectors (master) with the Digiware bus or to be integrated into a complete Digiware system as a slave.

Control over I/O modules as a Digiware master. (Up to 6 x IO-10 expansion modules may be daisy chained as shown.

C66 IO-10 IO-10

Using the controller as a slave. Part of a Digiware chain and replacing the U10 digiware module that sends the voltage sensing information into the chain. (Utilized by other digiware measurement modules to provide voltage).

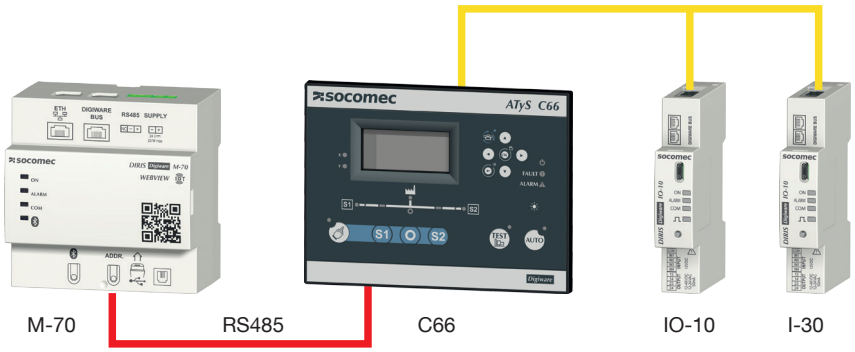
C-31 C66 IO-10 I-30

These two options can be selected on the menu, to change between slave and master, go to PARAMETERS / COMMUNICATION / DIGIWARE MODE.

Note: it's not possible to be at the same time master over IO and slave in the Digiware chain.

Ethernet

For the ATyS C66 controller to be able to communicate on MODBUS TCP over Ethernet, it's necessary to add a gateway to convert from RS485 to RJ45 and use TCP protocol:



M-70 RS485 C66 IO-10 I-30

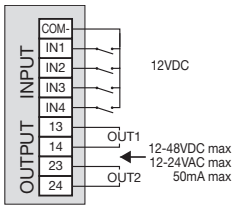
When the D70 or M70 Socomec gateways are used, the ATyS C66 can be connected by RS485 or with the Digibus.

Using Diris D70 gateway.

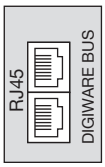
Note: when the controller is part of a Digiware chain, it's not possible to use the external I/O modules in direct connection with the controller.

I/O module connections:

Digital Inputs / Outputs



Digiware Bus



Total power consumption per module is 0.5W and each 50mts (164 feet) of RJ45 cable 1.5W extra should be considered for the design of the installation.

For more technical details on the Digital I/O modules consult the I/O module Quickstart.

I/O module connection cables:

RJ 45 Digiware bus cables available can be ordered according to their length:

Longueur (m)	Quantité	Référence
0.1	1	**4829 0181**
0.2	1	**4829 0188**
0.5	1	**4829 0182**
1	1	**4829 0183**
2	1	**4829 0184**
5	1	**4829 0186**
10	1	**4829 0187**
50 m reel + 100 connectors		**4829 0185**

Note: these cables are specific RJ45 cable for use with the DIGIWARE bus, do not use standard RJ45 cables.
To reduce the electromagnetic emissions, it is recommended to use the shortest length possible according to each case. The maximum length of the Digiware bus is 100 meters (328 feet).

A end-of-the-bus resistance is recommended for safe communication between the modules and the controller:

	Quantity	Part number
	1	**4829 0180**

Configuration of the modules:

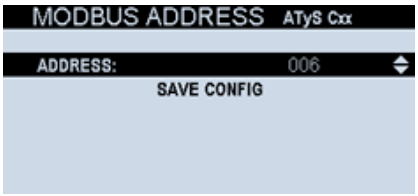
Once the controller is powered up, the modules will receive power supply and by changing the settings:

1. PARAMETERS/COMMUNICATIONS/DIGIWARE MODE:
   - Change the type from “SLAVE” to “MASTER OVER I/O”
2. PARAMETERS/COMMUNICATIONS/I/O:
   - Press OK on “EXTERNAL I/O DETECTION”. The devices will be detected and added to the list
3. PARAMETERS/COMMUNICATIONS/I/O/EXTERNAL I/O CONFIG:
   - In this menu, the function of each one of the external inputs and outputs can be chosen.
   - To identify the different modules, there is an “ID” number on the front face of the modules that will be shown on the display.

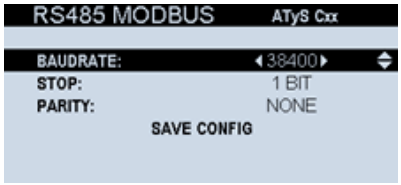
Communications Menu:

The ATyS C66 has RS485 communication by default using MODBUS RTU protocol. Inside the communication menu the main parameters to make that communication effective can be set.

- MODBUS ADDRESS: By default 6, any value between 1 and 247 can be used.

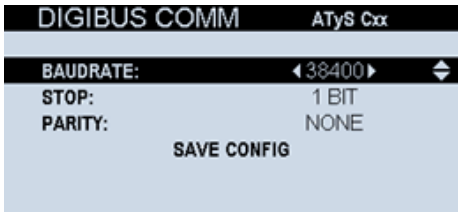


- RS485 MODBUS: All Modbus parameters can be set here:

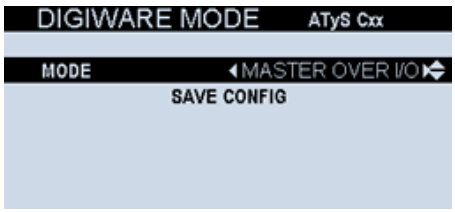


- BAUDRATE (1200-2400-4800-9600-19200-38400-57600-115200) By default 38400.
- STOP: (1BIT – 2BITS) By default 1 BIT
- PARITY: (ODD-EVEN-NONE) By default none

- DIGIBUS COMM: The same parameters than for RS485 can be set also for the Digibus connection (RJ45 inputs on ATyS C66) when integrated in a DIRIS Digiware system.

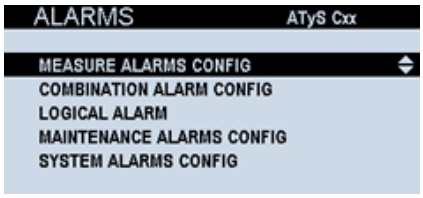


- DIGIWARE MODE: to be able to use the controller inside a Digiware chain, it's needed to change the parameter MODE to SLAVE. To be able to use external I/O modules the function of the RJ45 has to be switched to "MASTER OVER I/O" changing the MODE parameter:



11.1.7. ALARMS parameters menu

This menu allows users to configure alarms, these alarms are different from FAULTS. They are linked to the alarm LED only and are all user configurable. Fault are internal to the controller functioning and cannot be configured, see chapter 12 MAINTENANCE for more details on FAULTS.



The ALARMS menu is divided into 5 different sub-menu depending on the type of alarm. However all alarms have the following common settings :

ALARM ID: This defines the ID of the alarm, it will be shown on the alarm log, screen and communications if the alarm is activated. The number of available alarm ID depends on the type of alarm:

- 4 alarms available for MEASURE
- 6 alarms available for MAINTENANCE
- 4 alarms available for COMBINATION
- 4 alarms available for LOGIC
- 8 alarms available for SYSTEM

STATUS: This setting defines if the alarm is used or not, it can be set to "ENABLED" or "DISABLED". By default all alarms are set to "DISABLED".

ACK METHOD: This setting allows users to define the acknowledgment method for each individual alarm. Once acknowledged (if the alarm level is reset) the alarm will be removed from ongoing alarms and the alarm LED will be turned off if no other alarm is ongoing.

Users can choose the following acknowledgment methods:

- **NONE:** Alarm does not need to be acknowledged.
- **DISPLAY/COM:** A popup will appear on the screen that users can use to manually acknowledge the alarm, or this can also be done using the MODBUS communication order.
- **ON INPUT:** Users can program an input to acknowledge the alarm.

By default this setting is set to “NONE”.

INPUT TYPE: This option is only available if the “ACK METHOD” has been set to “ON INPUT”. It defines if the input used to acknowledge the alarm is “INTERNAL” (controller input), or “I/O MODULE X” (X depending on the number of the I/O module). This settings can also be set to “NONE” meaning that no inputs will be used to acknowledge the alarm.

By default this setting is set to “NONE”.

ACK INPUT: This will define which input (number) to use. It can be configured from INPUT 1 to INPUT 6 for INTERNAL inputs, INPUT 1 to INPUT 4 for I/O MODULE inputs. If the “ACK METHOD” is not “ON INPUT” or the “INPUT TYPE” has been set to “NOT USED” this option will not be available. By default this setting is set to INTERNAL.

By default this setting is set to “INPUT 1”.

OUTPUT TYPE: This option allows users to configure outputs to relay the alarm information. Users can “INTERNAL” (controller output), or “I/O MODULE X” (X depending on the number of the I/O module) to use external module outputs .

This settings can also be set to “NOT USED” meaning that no outputs will be used to relay the alarm. By default this setting is set to “NOT USED”.

OUTPUT REPORT: This setting is available is available only if the setting “OUTPUT TYPE” is not configured to “NOT USED”. This will define which output (number) to use. It can be configured from OUTPUT 1 to OUTPUT 6 for INTERNAL inputs, OUTPUT 1 to OUTPUT 2 for I/O MODULE inputs.

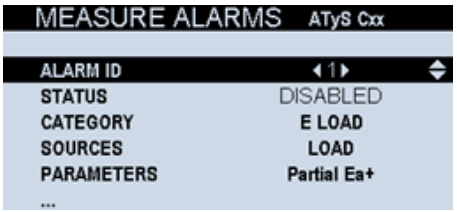
CRITICALITY: This defines the level for each alarm, users can choose “INFORMATION”, “WARNING” and “CRITICAL”, this last setting represents the highest level of criticality. This information will be registered in the alarm log and can be consulted with the webserver function on the Diris M-70 gateway module.

When using inputs or outputs for alarm functions if the inputs are already programmed to other functions the controller warns using a pop-up message, if validated the current functions will be overwritten. Before confirming make sure that the inputs and outputs that will be overwritten are not used in your system, press “OK” again for 1.5s to confirm overwriting the current configuration.

Note: If using the “AUD – Audible alarm” output, this output will only be active when a alarm set to “CRITICAL” is active.

MEASURE ALARMS CONFIG

This menu is only available on the ATyS C65, it allows users to link alarms to measurement variables.



CATEGORY: This defines which type of variable will trigger the alarm, users can choose from the following variables:

- **E LOAD:** Energy (consumption) from the load side.
- **E SOURCES:** Energy (consumption) from the source side.
- **V/U/F LOAD:** The load voltages or frequency.
- **V/U/F SOURCES:** The source voltages or frequency.
- **P/Q/S/PF:** The power values and power factor (load only)
- **I :** The current value (Load only)

SOURCES: This setting allows users to choose which source will be monitored for the variable configured above (only for variables linked to “SOURCES”).

PARAMETERS: Each “CATEGORY” is divided into more precise variable, this allows users to choose exactly which value will trigger the alarm.

UPPER/LOWER THRESHOLD: Each parameter will have a configurable upper and lower threshold, when the threshold is reached the alarm will be active until the value of the parameter measured falls under the hysteresis value.

HYSTERESIS (%): When the parameter measured is in the hysteresis value the alarm will be deactivated. The hysteresis value is a percentage of the upper and lower threshold value. Hysteresis can be configured from 0.00% up to 10.0% by increments of 0.1%.

The table below details all the parameters and their associated thresholds:

Category	Parameter	Parameter description	upper/lower threshold range
E LOAD & E SOURCES	Partial Ea-	Partial active energy generated.	**0-1000000kwh**
	Partial Ea+	Partial active energy consumed.	**0-1000000kwh**
	Partial Es	Partial apparent energy.	**0-1000000kwh**
	Partial Er	Partial reactive energy generated.	**0-1000000kwh**
	Partial Er+	Partial reactive energy consumed.	**0-1000000kwh**
V/U/F LOAD & SOURCES	F	Frequency.	**40-80hz**
	Uph OR	Any phase-to-phase voltage .	**0-6300000V**
	Uph AND	All phase-to-phase voltages.	**0-6300000V**
	Unba	(SOURCES only) Phase-to-phase amplitude unbalance.	**0-6300000V**
	Usys	Phase-to-phase average.	**0-6300000V**
	Uunb	(SOURCES only) Phase-to-phase vectorial unbalance.	**0-6300000V**
	Vph OR	Any phase-to-neutral voltage.	**0-6300000V**
	Vph AND	All phase-to-neutral voltages.	**0-6300000V**
	Vn	Neutral voltage.	**0-4000000V**
	Vnba	(SOURCES only) Phase to neutral amplitude unbalance	**0-4000000V**
	Vsys	Average phase-to-neutral voltage.	**0-4000000V**
	Vunb	(SOURCES only) Phase-to-neutral vectorial unbalance.	**0-4000000V**
P/Q/S/PF	PF OR	Any phase power factor.	**-1.0 - 1.0**
	PF AND	All phase power factor.	**-1.0 - 1.0**
	PFtot	Total power factor.	**-1.0 - 1.0**
	PF TYPE OR	Any phase power factor type.	0: Undefined 1: Leading 2: Lagging
	PF TYPE AND	All phase power factor type.	0: Undefined 1: LEADING 2: LAGGING
	PF TYPE tot	Total phase power factor.	0: Undefined 1: LEADING 2: LAGGING
	P OR	Any phase active power.	**0-9999999 w**
	P AND	All phases active power.	**0-9999999 w**
	Ptot	Total active power.	**0-9999999 w**
	Q OR	Any phase reactive power.	**0-9999999 VAR**
	Q AND	All phases reactive power.	**0-9999999 VAR**
	Qtot	Total reactive power.	**0-9999999 VAR**
	S OR	Any phase apparent power.	**0-9999999 VA**
	S AND	All phases apparent power.	**0-9999999 VA**
	Stot	Total apparent power.	**0-9999999 VA**
I	Iph OR	Any phase current.	**10 000.0A**
	Iph AND	All phases current.	**10 000.0A**
	Inba	Current amplitude unbalance.	**10 000.0A**
	Iph sys	Total current.	**10 000.0A**
	Iunb	Current vectorial unbalance.	**10 000.0A**
	In	Neutral current.	**10 000.0A**

Note: Partial energies can be reset using the ENERGY “4.9 RESET ENERGY” dashboard.

MAINTENANCE ALARMS CONFIG

This menu allows users to set up to 6 alarms to activate according to configurable maintenance thresholds.
To access this menu users will need the maintenance password. The alarms configured in this menu will be visible on the maintenance dashboard.

The alarm type will define the maintenance parameter to check, there can be multiple alarms configured on of the same type.

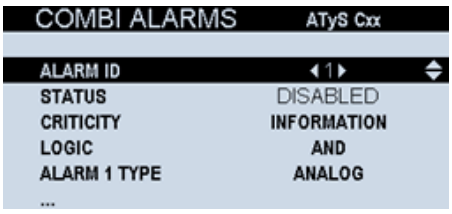
Possible alarm configuration:

Alarm Type	Alarm Name	Description	Threshold Unit	"Threshold default value"	"Upper Threshold max. value"
1	CYCLE EXC.	"Maximum number of switching cycles. A cycle is when the switch has reached the opposite source and transferred back once (for example I-off, off-2, 2-off, off-1)"	Number of cycles	5000	10 000
2	OPERATION EXC.	Maximum number of operation (any change of position order including off position)	Number of operations	10 000	10 000
3	GEN1 ACTIVE DURATION	"Total amount of time that the genset 1 has been working (supplying or not the load). Can be used for genset maintenance purposes."	Hours	250	400 000
4	GEN2 ACTIVE DURATION	"Total amount of time that the genset 2 has been working (supplying or not the load). Can be used for genset maintenance purposes."	Hours	250	400 000
5	GEN1 ONLOAD DURATION	Total amount of time that the genset 1 has been connected to the load. Can be used for genset maintenance purposes.	Hours	250	400 000
6	GEN2 ONLOAD DURATION	Total amount of time that the genset 2 has been connected to the load. Can be used for genset maintenance purposes.	Hours	250	400 000
7	INSPECTION	"Counts the time after the last inspection (entered in “Inspection Mode” of the maintenance menu). Can be used for periodic inspection/service purposes on the A TS. By default it is set to 300 months which is the maximum value. Socomec recommends 12 months after servicing."	Months	300	300
8	CONNECTED	Maximum number of time the input CONNECTED has been switched on	Action	3	10 000
9	WITHDRAWN	Maximum number of time the input WITHDRAWN has been switched on	Action	3	10 000
10	TOTAL TRIP BRK1	Maximum of time the input TRIP BRK1 has been switched on	Action	3	10 000
11	TOTAL TRIP BRK2	Maximum of time the input TRIP BRK2 has been switched on	Action	3	10 000

COMBINATION ALARMS CONFIG

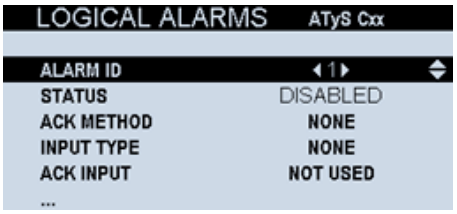
This alarm option is only available on the ATyS C65. This menu allows users to combine alarms using boolean combinations in order to create a new alarm. For example combine a MEASUREMENT ALARM and a MAINTENANCE ALARM with the AND operator (when both alarms are active the COMBINATION ALARM will also be active).

Up to 4 alarms can be created with this combination logic. To combine alarms select the alarm types from ANALOG (MEASUREMENT), LOGICAL, MAINTENANCE and select the alarm ID of the corresponding type, then select the operator to use (AND , OR).



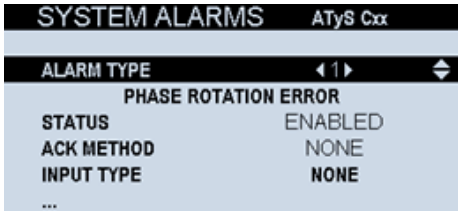
LOGICAL ALARMS CONFIG

This alarm options allows users to create alarms based on the state of INTERNAL or I/O module inputs.



SYSTEM ALARMS CONFIG

This menu allows users to create alarms to detect failures on the installations. Up to 8 SYSTEM ALARMS can be created. There are up to 8 system alarms that can be used to detect minor failures on the installation.



The alarm type will define the parameter to check, for these alarms the alarm type replaces the alarm ID. Only one of each alarm can be active simultaneously.

Alarm Type	Alarm Name	Description
1	PHASE ROT	Activated if a change of phase rotation is detected.
2	EXTERNAL ALARM	Activated when an external alarm input is active.
3	I0-10 FAILED	Activated if a configured I/O module is not detected (only on C65)
4	CONTROLLER UNAVAILABLE	Activated if the controller is not able to perform automatic operations (major faults or product inhibited)
5	LOAD NOT SUPPLIED	Activated if the load is not connected to a power source
6	RTC LOW BATT	Activated if the internal RTC battery needs to be replaced
7	DC AUX PB	Activated if the auxiliary DC supply connected is less than 10 VDC
8	GENSET RUNNING	Activated if the source linked to a generator is available 10 seconds after the genset signal has been removed (after cool-down timer).

11.1.8. PASSWORDS

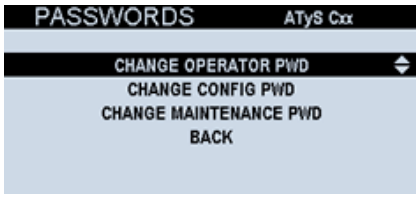
The controller provides 4 levels of security intended for 4 different types of users:

- Standard user – it requires no password and permits the visualization of the parameters and values measured by the controller. This is the level by default. When using other levels the controller will automatically timeout after 5 minutes and will revert to standard user level.
- Operator - This requires the Operator password that by default is set to 4000 and can be changed by the user in Configurator level in Parameters. This level allows all the above as well as changing the operating mode, sending position orders to the switch and setting the engine exerciser parameters and alarms.
- Configurator – This requires the Configurator password that by default is set to 1000 and can be changed by the user. This allows all the above as well as to change any configuration of the controller such as operating range, timers, type of control, display settings, etc…)
- Maintenance – This is the highest level of security. It requires the maintenance password (by default set to 1010) and it permits all the above as well as resetting counters, rebooting the device, changing and restoring passwords of other users and entering inspection date and telephone number.

Passwords by default (factory settings):

User (access to visualization)	No password
Operator (access to control functions)	4000
Configurator (access to parameter setting)	1000
Maintenance (access to service menu)	1010

These default passwords can be changed in the Parameters / Passwords menu (The user will need to have Configurator or Maintenance access to change and save passwords).



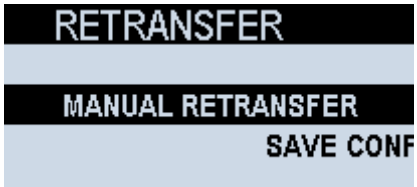
⚠ WARNING ! If the maintenance password is lost it cannot be restored. Please contact SOCOMEC in case this operation is needed.

11.2. SPECIFIC FUNCTIONS Menu

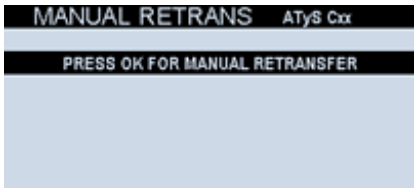
The controller integrates various specific functions that can be configured in this menu:

11.2.1. Manual retransfer

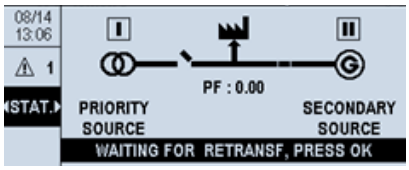
If this function is active (“YES”), when loads are supplied from the emergency source, the controller will not return to the normal source when this returns until a confirmation order is received through the HMI or through an input that has been configured to do so. This also applies to LOAD TEST requests where a manual retransfer will be needed before returning to the priority source.



Every time the Manual Retransfer is requested, a pop-up will appear on the screen allowing the user to act immediately or to be dismissed and done later by using the menu CONTROL/MANUAL RETRANS:



If the dashboard key is pressed on the HMI keypad while manual retransfer is needed, there will be a message on screens 1.2 and 2.1 reminding the user that a retransfer confirmation is required.



11.2.2. In-phase transfer

This function allows users to transfer sources when they are in-phase (with similar voltage values) this reduces the impact of the transfer on the loads and increases RTSE lifetime when the transfer is done by a fast RTSE (transfer time <50ms).

The in-phase transfer function is available only for ATyS FT typology of RTSE or equivalent (2 position switch Class PC, I-II) switches must change position in less than 50ms.

This function will ask the controller monitor, the voltage, the frequency and the phase angle of both sources. When a transfer is requested from one available source to another the controller will verify that these parameters are sufficiently close in value before transferring.

Users can change the following settings of this function to define the acceptable difference in the sources:

All settings for the in-phase monitoring transition with the ATyS FT switch:

DELTA VOLTAGE (%): This defines the maximum difference in voltage amplitude between the two sources. This value can be configured from 0.5 to 20% of nominal voltage, by default this is set to 2%.

DELTA FREQUENCY (Hz): This defines the maximum difference in frequency between the two sources. This setting can be configured from 0.1 to 0.5 Hz, by default this is set to 0.2 Hz.

DELTA ANGLE(°): This defines the maximum difference in phase angle between the two sources. This setting can be configured from 1 to 30°, by default this is set to 7°.

IPT TIMER (ms): This the dwell time, the time necessary to stay in the correct voltage window before a transfer can be authorized. This value is configurable from 0 to 5 000ms and the default value is 500ms.

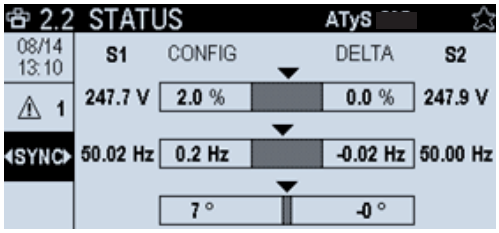
IN PHASE RESEARCH DELAY (s): This is the maximum time that is allowed to find a synchronism between both sources. This value is configurable from 0 to 1200s, by default this value is set at 180s.

FAIL TO SYNC OPT: This option will determine what action will be done if the “IN PHASE RESEARCH DELAY” has elapsed; Options are :

- **USER CHOICE:** a pop-up message will prompt users to decide between a normal transfer (without synchronism) or continue waiting for the correct window.

- **FORCE TRANSFER:** The transfer will take place at the end of the research timer even if both sources are not synchronized.

At any time, the synchronism status of the 2 sources can be checked on the dashboard 2.2 STATUS / SYNC:

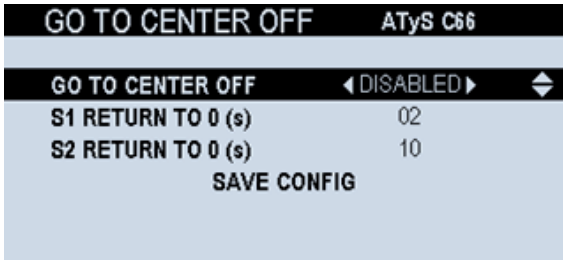


Note: in-phase transfer is only available for I-II switches, selected technology must be ATyS FT, this function cannot be enabled when using other technologies.

11.2.3. Go to center off

This function allows the switch to go to center-off position (only typologies with 0 or center-off position) when the current connected source is lost or not available (supply to the load is not good enough due to undervoltage, phase lost, overvoltage, frequency out of limits,…).

It can be used to avoid providing bad quality energy to the loads for extended periods of time and also to avoid the power ramp and transients that may occur before the source is stable to go to the loads, as some loads might be sensitive to these events.



The following options are available :

GO TO CENTER OFF: Status of the function, user can choose when to activate the function :

- DISABLED: Function not used.
- ALWAYS ENABLED: Return to 0 will be active on both sources.
- FROM PRIORITY SOURCE: The switch will return to the 0 position only when the priority source is lost.
- FROM SECONDARY SOURCE: The switch will return to the 0 position only when the alternative source is lost.

S1 RETURN TO 0 (s): This defines the time that S1 is unavailable before the position 0 (center-off) order is sent (This timer will be taken into account only if is linked to the previous parameter). This can be configured from 0-10s, by default it is set to 2s.

S2 RETURN TO 0 (s): This defines the time that S2 is unavailable before the position 0 (center-off) order is sent (This timer will be taken into account only if is linked to the previous parameter). This can be configured from 0-10s, by default it is set to 10s.

Note:
- if these timers are shorter than the FAILURE TIMER, then in case of source loss the RTSE will be sent to the 0 position before the corresponding source is considered as lost.
- this function will only work if both the switch and the controller are still supplied (by the opposite source, an external source, UPS or others, independent from the emergency and normal source).

If the typology of the switch (technology) doesn't allow the function, a message will pop up as follows:

11.2.4. Elevator

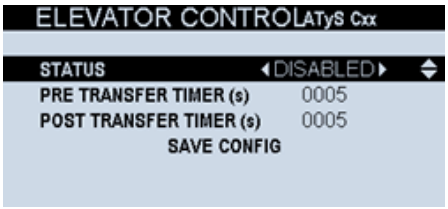
The elevator function is used to communicate to sensitive loads such as elevators, motors, compressors, or other loads, that the controller is ready to perform a transfer.

When ENABLED this function will activate an output “ELEVATOR” (to program this output go to “PARAMETER”>”IO”>”OUTPUTS)” before and after a transfer takes place. This output can be linked to the load controls so that they can be ready for the transfer.

This function has two parameters:

- PRE TRANSFER TIMER(s): This is the time that the output will be active before the transfer takes place. This timer can be configured from 0s to 9999s, by default it is set to 5s.

- POST TRANSFER TIMER(s): This is the time that the output will remain active after the transfer has finished. This timer can be configured from 0s to 9999s, by default it is set to 5s.



11.2.5. Forced load shedding

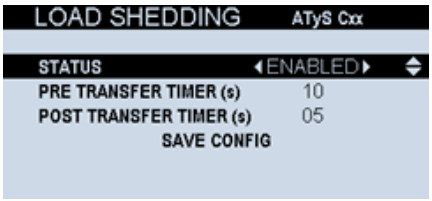
This function is used to send orders to an external switch in order to shed non-essential loads when connected to the alternate source. This is useful to ensure critical loads remains on, when the secondary source can generate less power than the main source.

When ENABLED, this function will activate the output “FORCED SHEDDING’. It will be active for a set time before connecting to the alternate source; during connection on the alternate source; and for a set time after returning to the priority source. This output should be linked to the switch which will open the contact with the non-essential loads.

User can program the following timers:

PRE TRANSFER TIMER (s): The output “FORCED SHEDDING” will be active for the duration of this timer before transferring to the secondary source. This timer will also delay the transfer to the secondary source. This timer can be configured from 0s to 60s, by default it is set to 4s.

POST TRANSFER TIMER (s): After transferring to the priority source the output “FORCED SHEDDING” will remain active for the duration of this timer. This timer can be configured from 0s to 60s, by default it is set to 1s.

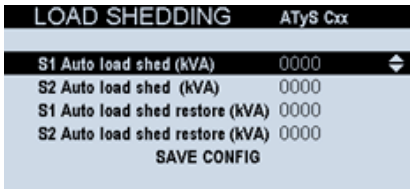


11.2.6. Smart load shedding

This function like the “FORCED LOAD SHEDDING” allows users to shed non-essential loads. The difference with the previous function is that loads will be shed based on the current level of power being used.

Users can define a level in kVA of threshold (FAIL) and hysteresis (RETURN), when the power on the load reaches the threshold, the output “SMART SHEDDING” will be active. When the kVA level falls under the kVA threshold the output will return to the inactive state.

The output “SMART SHEDDING” should be linked to a motorized switch able to disconnect non-essential loads.



User can define the following values:

S1 Auto load shed (kVA): This is the threshold level for Source 1 (when the load is connected to source 1), past this value the “SMART SHEDDING” output will be active. This value can be configured from 0 to 6000kVA, by default it’s set to 0kVA.

S2 Auto load shed (kVA): This is the threshold level for Source 2 (when the load is connected to source 2), past this value the “SMART SHEDDING” output will be active. This value can be configured from 0 to 6000kVA, by default it’s set to 0kVA.

S1 Auto load shed restore (kVA): This is the return value (hysteresis), when the power values on a load connected to source 1 falls below this threshold if the output “SMART SHEDDING” is active it will become inactive. This value must be less than the value set in “S1 Auto load shed (kVA)”. This value can be configured from 0 to 5999kVA, by default it’s set to 0kVA.

S2 Auto load shed restore (kVA): This is the return value (hysteresis), when the power values on a load connected to source 2 falls below this threshold if the output “SMART SHEDDING” is active it will become inactive. This value must be less than the value set in “S2 Auto load shed (kVA)”. This value can be configured from 0 to 5999kVA, by default it’s set to 0kVA.

Note: for Smart load shedding it is necessary to use current transformers with the product. See chapter "9.3. AC Dual Power Supply / Sensing", page 22.

Power up in auto

Enabling “power up in auto” will force the controller to start in automatic mode every time the controller recovers power (even if mode before the power failed was manual). Set to "DISABLED" as default.

11.2.7. HVAC compressor

This is a specific function designed to preserve the lifetime of the compressors in HVAC or other sensitive loads. It allows users to set a period of time for which compressors must be disconnected when transferring to the priority source before they can be activated again allowing them to end their cycle properly.

This function is linked to the output “HVAC COMPRESSOR”, this output should be linked to a motorized switch that will connect or disconnect the compressors.

When transferring from the secondary source to the priority source this function will activate the output “HVAC COMPRESSOR” when the transfer sequence is initiated, and will de-activate this output at the end of the set timer, the timer starts counting when the opposite source is reached.

Users can set the following parameters:

STATUS: “ENABLED” or “DISABLED” (note that the output “HVAC COMPRESSOR” must be programmed to make use of the function). By default this is set to “DISABLED”.

HVAC COMPR. TIMER (s): This defines the time the compressors (the output “HVAC COMPRESSOR”) must be disconnected after re-transferring to the priority source. By default this timer is set to 20s it can be configured from 0 up to 3600s by increments of 1s.

11.2.8. Tripping actions

This specific function allows user to configure how the controller should react if one or either of the breakers used in the RTSE or as upstream protection of the RTSE sends a signal indicating that it has tripped.

Note: for these functions to be used 2 inputs must be configured to "TRIP BRK1" and "TRIP BRK2".

Settings in the menu are the following:

SWITCH: This setting defines which breaker the next settings will be applied to, breaker 1 and breaker 2 can use different settings. The options are **“BREAKER 1”** this setting is active when the input “TRIP BR1” is active, and **“BREAKER 2”** when the input “TRIP BRK2” is active.

TRIP ACTION: This setting will define how the controller will react when the inputs “TRIP BRK1” (if “SWITCH” is set to “BREAKER 1”) or if “TRIP BRK2” (if “SWITCH” is set to “BREAKER 2”) are active. The following options are available:

- **TOTAL INHIBITION:** Controller will be inhibited until the “TRIP BRK” input is deactivated. With this type of inhibit both manual and automatic operations will be blocked, and the generator start signal will also be blocked (the generator start signal will only be blocked as long as the controller is powered on).
- **TRIP = SOURCE LOST:** As long as the “TRIP BRK” input is active the corresponding source (Source 1 for BRK1, source 2 for BRK2) will be considered as not available, in this case the controller will continue to work in automatic mode.
- **PARTIAL INHIBITION:** Only the automatic mode is inhibited, manual mode, and the generator start signal remain functional.
- **INHIBITION:** The automatic mode is inhibited, in case of main source failure the generator start signal will not be activated (as long as the controller remains powered on). The manual mode remains accessible.
- By default this menu is set to “TOTAL INHIBIT”.

OP MODE AFTER TRIP: This option allows users to select which operating mode will be active once the “TRIP BRK” input is inactive. The following options are available :

- **PREVIOUS MODE:** The controller will return to the working mode active before the “TRIP BRK” input was received (automatic, manual, inhibited).
- **PARTIAL INHIBITION:** Only the automatic mode is inhibited, manual mode, and the generator start signal remain functional.
- **INHIBITION:** The automatic mode is inhibited, in case of main source failure the generator start signal will not be activated (as long as the controller remains powered on). The manual mode remains accessible.

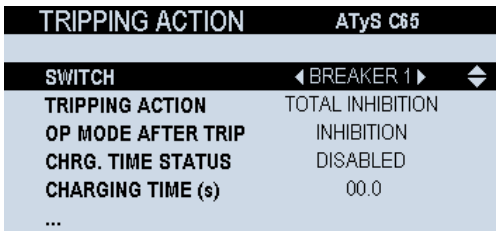
By default this setting is set to “INHIBITED”.

CHRG. TIME STATUS: This setting allows users to configure a charging time before transferring, this is designed for RTSE based on circuit breakers that require time to charge spring or other energy accumulating mechanisms. When activated this setting will wait the specified time before sending out another position order (open or close) on the breaker. Users have the following options :

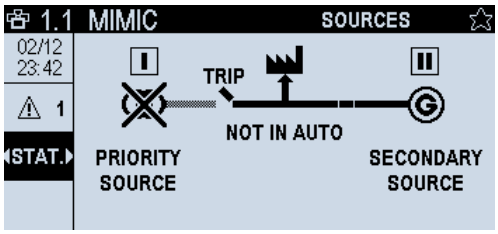
- **DISABLED:** Controller will not take into account charging times when transferring, transfer orders will be given as soon as the standard operation timers have elapsed.
- **WHEN OPEN:** After the breaker has opened (BREAKER 1 or BREAKER 2) the CHARGING TIME will be taken into account before sending another order to the same breaker.
- **WHEN CLOSED:** After the breaker has closed (BREAKER 1 or BREAKER 2) the CHARGING TIME will be taken into account before sending another order to the same breaker.

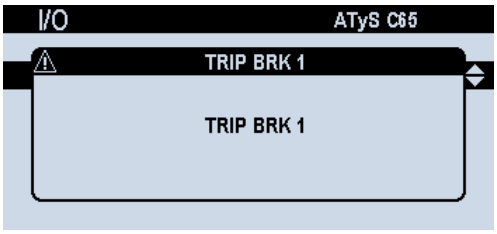
CHARGING TIME (s): Time it takes for the breaker to charge in order to be able to change position. If the breaker has a charged output to indicate that the breaker is charged the controller input “BREAKER 1/2 CHARGED” can be configured, when this input is activated the charging time will be bypassed.

Note: Configuring a charging time may delay the transfer sequence.



When a tripping action is detected ("TRIP BRK1 or "TRIP BRK2" is active) the controller will inform the user with a pop-up, the information that the breaker is tripped. This information will also be visible on the main synoptic.





WARNING ! When using a CB type RTSE, if either of the breakers trip without using the “TRIP BRK1” or “TRIP BRK2” inputs this will be considered as an “UNEXPECTED TRANSFER” fault. To avoid such faults it is therefore recommended to use the above function and inputs.

11.2.9. Load adding delay

The load adding delay function allows user to gradually add separate loads when transferring between sources.

This function can be used to manage and control the inrush-current in the installation after a transfer by gradually adding loads.

These timers available in “SPECIFIC FUNCTION” > ”LOAD ADDING” are linked to outputs “ON DELAY 1-7“ (variable from 1 - 7 corresponding to timer number). To program these outputs go to “PARAMETERS” > “I/O” > ”OUTPUTS”.

The settings in the menu are as follow:

STATUS : to Select when the load adding function is applied, option are :

- DISABLED (function not active)
- TO SOURCE 2 (function will be active only when transferring to source 2)
- TO SOURCE 1 (function will be active only when transferring to source 1)
- ALWAYS ENABLED (function will be active in all cases of transfer)

PRE TRANSFER TIMER (s): this allows user to configure the time for which all loads should be removed before the transfer. During this time all “ON DELAY” outputs will be active. This timer is only counted when transferring between two available sources; in case of loss of source, this timer will not be counted.

This timer will delay the transfer by the amount set.

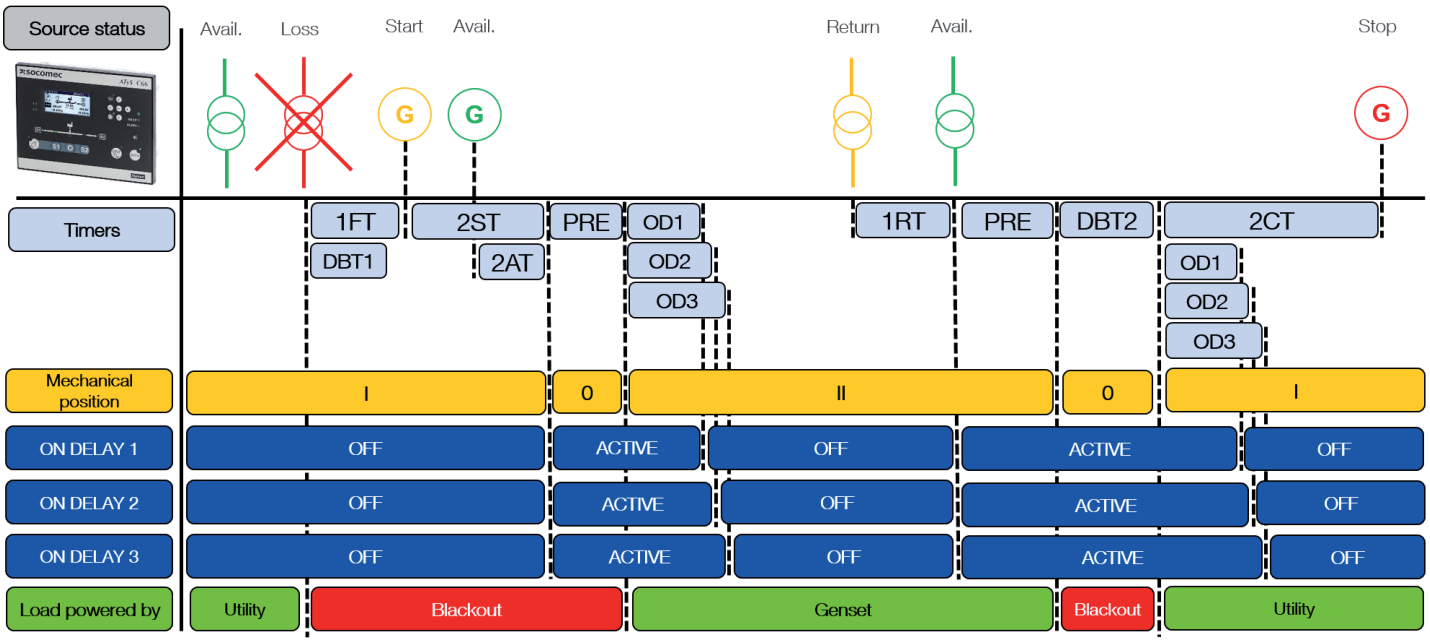
ON DELAY 1 TIMER (s): Time for which the output “ON DELAY 1” is active after a transfer (default 20s, max 3600s)

ON DELAY 2 TIMER (s): Time for which the output “ON DELAY 2” is active after a transfer (default 40s, max 3600s)

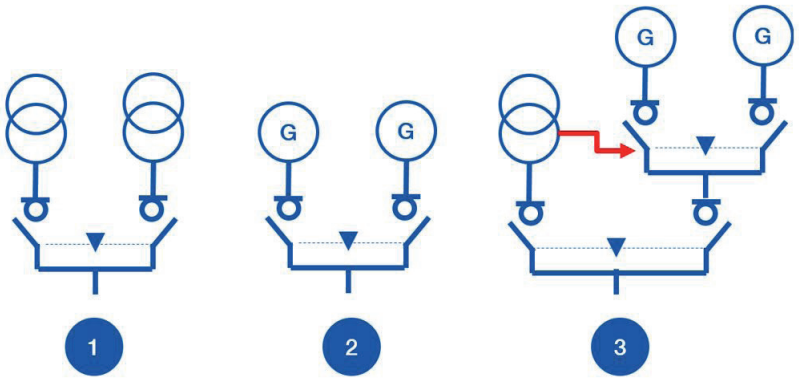
ON DELAY 3 TIMER (s): Time for which the output “ON DELAY 3” is active after a transfer (default 60s, max 3600s)

LOAD ADDING	ATyS C65
STATUS	◂ TO SOURCE 1 ONLY ▸
PRE TRANSFER TIMER (s)	10
ON DELAY 1 TIMER (s)	0020
ON DELAY 2 TIMER (s)	0040
ON DELAY 3 TIMER (s)	0060
...	

The following chronograph details the load adding function:



11.2.10. Cycler



This function allows users in Main-Main (1) and Gen-Gen (2) to cycle the load periodically on each source.

Cycle functions are generally used to divide equally the use on the transformers or generators upstream or to change the sources to minimize electricity costs using night/day billing.

To activate this function controller must be in Main-Main Or Gen-Gen application.

CYCLER	ATyS C65
STATUS	◀ DISABLED ▶
TRANSFER METHOD	AUTOMATIC
S1 CYCLER DURATION (h)	0001
S2 CYCLER DURATION (h)	0001
TRANSFER TIME	00:00
...	

Once the function is enabled users will be able to configure the transfer validation method (automatic or transfer at a specific time) the time of transfer (if specific time has been selected in transfer method) as well as the duration of a cycle.

In case of a loss of source during a cycle, the controller will switch to the available source and stay there until the lost source becomes available and the cycle is over.

The settings in “BACKUP GEN GEN START MODE” are used in GEN-GEN mode only, when the input “BACKUP GENGEN” is active. This input usually comes from another ATS system or any other device indicating that the primary source is lost (schematic 3 on the image above), in this case the controller is used to cycle or manage two backup generators which are active when the priority source is lost.

To activate the backup gen-gen mode the controller must be in Gen-gen application, with an input configured to “BACKUP GENGEN”, in backup mode the 24 V.d.c auxiliary supply is mandatory to keep the genset start signals inactive (if the controller is not powered the outputs for generator start (5 & 6) will activate).

When an input is programmed to “BACKUP GENGEN, the controller will wait in the 0 position until the input is active. When the input is active the controller will go to the source which is set as the current priority source according to the configuration below. When the input is disabled again the controller will return to the 0 position.

This menu contains the following settings :

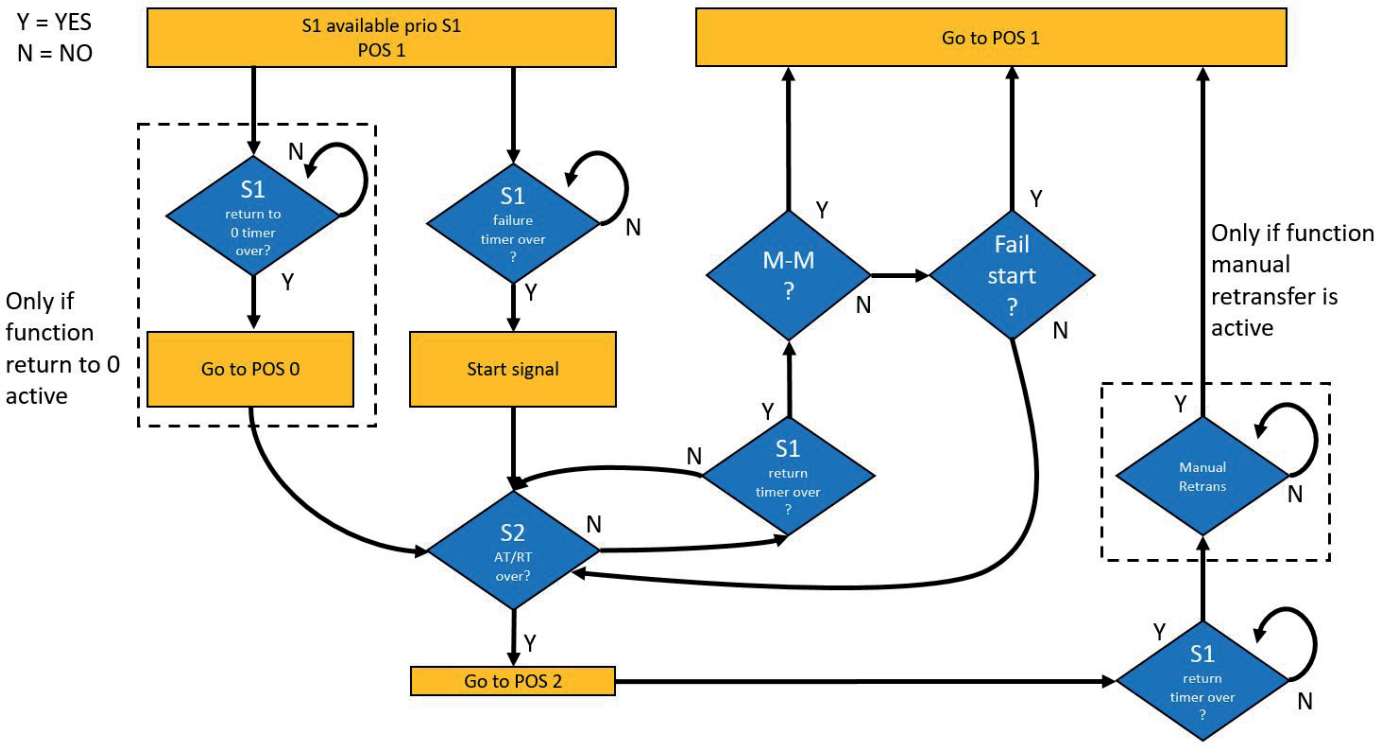
Setting	Option	Description
STATUS	ENABLED, DISABLED	Option to activate or not the cycling function, application must be GEN-GEN or MAIN-MAIN to enable.
TRANSFER METHOD	AUTOMATIC, SPECIFIC TIME	If AUTOMATIC is selected transfer will take place as soon as the set cycle duration is over. If specific time is selected transfer will take place only at the time configured if the cycler duration is completed.
S1 CYCLER DURATION (h)	0-9999	Duration of a cycle for source 1.
S2 CYCLER DURATION (h)	0-9999	Duration of a cycle for source 2.
TRANSFER TIME	00:00 - 23:59	Time of the day at which the transfer will take place (only if SPECIFIC TME has been set in TRANSFER METHOD).
BACKUP GEN GEN START MODE (active only if an input is programmed to “BACKUP GENGEN”		
PRIO SELECTION	PRIORITY SOURCE, FULL CYCLE, LEAST USED, ALTERNATE	"This setting is only active when the BACKUP GEN-GEN input has been programmed. It will determine which genset to start first in backup gen-gen mode: - PRIORITY SOURCE: genset on the source programmed as priority source. - FULL CYCLE : If cycler is ENABLED, the genset which has not completed its full cycle duration will start. - LEAST USED : will start the genset with the least run time. - ALTERNATE : will start the genset which was NOT the last to be active".

11.2.11. Commit

The commit function is used to force the transfer to the secondary source after loss of the priority source in the eventuality that source 1 returns before the transfer has been done, this function can be paired with the “MANUAL RETRANSFER” function allowing users to stay on source 2 in order to return only after maintenance has been verified on the source 1.

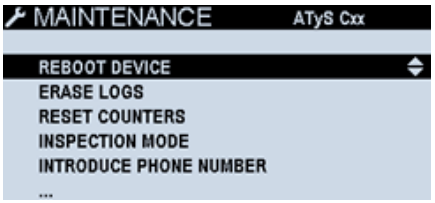
By default this function is set to DISABLED.

See graphic below for COMMIT function logic:

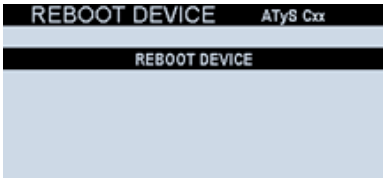


11.3. Maintenance Menu

The maintenance allows users to perform service-reserved actions on the controller. Users will require the maintenance password (default 1010) in order to access this menu.



REBOOT DEVICE: Pressing the “ok” button when this menu is highlighted will re-start the controller (turn off and on).The controller will request confirmation before starting the reboot:



No data will be erased during a reboot.

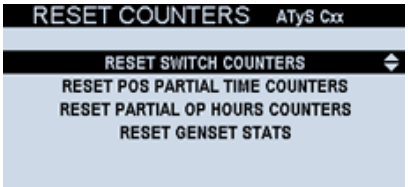
MAX OPERATIONS: This allows users to define the maximum number of operations for a set period of time. Users can modify the number of operations and the time period. This information should match the performances of the asscіated RTSE device and the installation.

- **MAX OPERATIONS:** maximum number of operations allowed in the set period of time. By default this value is set to 10 this value can be configured from 1 to 60.
- **Delay (min):** The period of time for which the maximum number of operations apply. By default this is set to 1 min can be configured up to 5 min (by steps of 1min).

ERASE LOGS: This menu allows users to erase the event log or the alarm log. A second confirmation will be required.

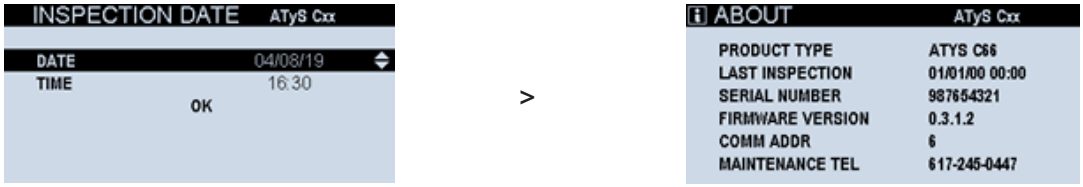
RESET COUNTERS: This allows users to reset the counters to 0 the following counters, before erasing the counters the controller will ask for confirmation. The following counters can be reset:

- **RESET SWITCH COUNTERS:** Counter for the number of operation on the switch / breakers.
- **RESET POS PARTIAL TIME COUNTERS:** Resets the counter for the partial time on position.
- **RESET PARTIAL OP HOURS COUNTERS:** Resets the counter for the partial operating time in hours.
- **RESET GENSET 1 STATS:** Resets all statistics for source 1 if source 1 is a generator.
- **RESET GENSET 2 STATS:** Resets all statistics for source 2 if source 2 is a generator.
- **RESET BYPASS COUNTERS:** Resets the number time the bypass was used.
- **RESET BREAKER 1 COUNTERS:** Resets the number of trips on the breaker 1.
- **RESET BREAKER 2 COUNTERS:** Resets the number of trips on the breaker 2.

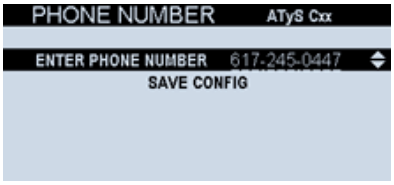


INSPECTION DATE: Allows users to enter the last inspection date & time.

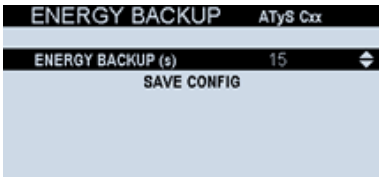
This should be entered after servicing the product, this information can be consulted on the main menu / ABOUT section by all the users.



INTRODUCE PHONE NUMBER: Allows users to enter a phone number this information will be shown on the ABOUT screen as the maintenance phone number, this can be used to enter the maintenance or emergency contact for the electrical installation.



ENERGY BACKUP (only on C65): The energy backup time can be set from 0 to 30 seconds. By default it is set to 15 seconds, this defines the time that the C65 can stay powered on after it is charged when both sources and auxiliary power is lost. The product is designed to guarantee 15s of backup power for 8 years.



11.4. Configuration through EasyConfig System software

EasyConfig System is a software tool that allows to configure the ATyS C66 and other Socomec products with a very intuitive interface. This also permits preparing configurations remotely (when not connected to the product), save preset configurations and loading them to the controller or multiple controllers. This is very useful when a large quantity of controllers need to be configured with the same or similar settings.

How to configure the main parameters by using Easyconfig System software:

Connect via communications or USB to the controller, open the Easyconfig software and follow the different screens to set all the required parameters.

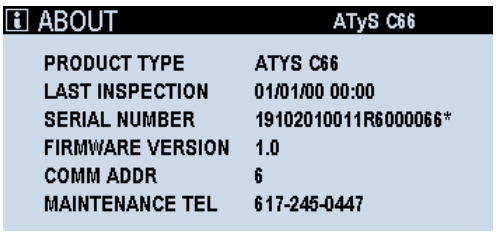
You can download EasyConfig for free from the following link:
https://www.socomec.com/easy-config-software_en.html

You can download the Instruction Manual on the following link:
https://www.socomec.com/operating-instructions_en.html

12. MAINTENANCE

12.1. About the controller

All the main information about the controller can be directly found inside the ABOUT menu, accessible through the main menu of the controller:



- PRODUCT TYPE : Model of the product ATyS C66
- LAST INSPECTION: This date is modified in the MAINTENANCE MENU / INSPECTION MODE by the service team by adding the new INSPECTION DATE after servicing the product for the first time. If there is no modification of this parameter, by default it will show “01/01/00 00:00”
- SERIAL NUMBER: Serial number of the product. The number can also be found on the top marking of the product as “N° S/N” followed by a number. This number may be requested by Socomec service team whenever technical support is required.
- FIRMWARE VERSION: Version of the controller firmware. This will only change in case of a product firmware upgrade, done by an authorized Socomec service team.
- COMMUNICATION ADDRESS: Modbus RTU communication address for the controller. It can be set through the wizard or inside the COMMUNICATION parameters (see chapter 11.1.6)
- MAINTENANCE TEL: This value is configurable inside the MAINTENANCE menu / INTRODUCE PHONE NUMBER option (for example, Socomec’s contact number or the maintenance manager in contact with the service team number).

12.2. Faults management and Troubleshooting

There are various events that can be listed as a fault on the controller. Unlike alarms, faults are not user-selectable, , will always be taken into consideration and related actions will be as follows:

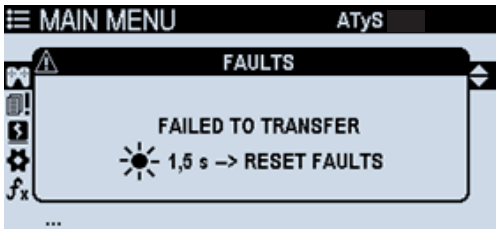
Fault	Description (cause)	Actions	Acknowledge / Cleared	Fault log	Pop-up	Fault LED	Output
Unexpected Transfer	The controller receives a feedback/return from the switch without sending any order (auto or manu). Also if loss feedback of current position.	Mode stays the same. Controller will start retries if position is unknown. If a position is reached, no retry takes place.	Can also be cleared through display or through RST - Reset Fault input.	Yes	Yes, "Unexpected Transfer"	BLINKS (priority)	FLT - Fault active
Failed to Transfer	Position not reached after an order sent by controller (auto or manu) or loss of feedback of the new source after sending a transfer command.	Mode stays the same. Controller will start retries.	Automatically cleared if the requested position is reached or cleared through display or through RST - Reset Fault input.	Yes	Yes, "Failed to transfer"	BLINKS (priority)	FLT - Fault active
Max operation per minutes reached	If the controller performs 10 operations in less than 1 minute (by default) (automatic or controlled/ manual)	Mode stays the same. During a timer, the controller will not do or allow any operation.	Automatic after the 1 minute (configurable through software) (value is dynamic).	Yes	Yes, "Max operations per minutes reached"	FIXED (non-critical)	FLT - Fault active
Max password attempts reached	User tries to enter a profile password more than X times set in the maintenance menu (by default 10 attempts)	Mode stays the same. Can't enter any password during X time set in the maintenance menu (by default 2 minutes)	Automatic after the set timeout (maintenance mode).	Yes	Yes, "Max number of tries reached, please wait: X s"	FIXED (non-critical)	FLT - Fault active
Genset Failstart	Controller tries to start a genset (as configured) and after the genset start delay, the genset doesn't start (controller doesn't see the source on)	Mode stays the same. Genset start relay remains active unless other source is available.	Automatic if genset starts or if source is set as Main/Utility.	Yes	Yes, "Engine fail to start"	BLINKS (priority)	FLT - Fault active
External fault	If an input is selected as FTE - External Fault and becomes active	Switch goes to position 0 / center-off directly without timers and the mode is set to Partial Inhibit (genset starts if needed).	Input mustn't be active and reset by user is requested (by RST- Reset Fault input or through display.	Yes	Yes, "External fault"	BLINKS (priority)	FLT - Fault active

For faults with a pop-up, the pop-up will either be cleared when the fault is cleared or by pressing any button on the front face of the controller. The total number of faults logged on the controller is dynamic, whilst the total number of “faults + alarms” is 100. Total events excluding faults and alarms 3000 and uses a FIFO listing.

To clear Faults through the HMI, it is possible through the LOG/FAULTS menu with the option “PRESS OK TO CLEAR FAULTS”, using the configurator profile password. There is also a shortcut by holding the button for 1,5s and validating on the pop-up that appears. If the fault is still active, it will be inside the log “in progress” but the fault

LED and output will be off. If the faults are no longer active, they will be logged in the “history” log.

Clearing the fault will be automatically proposed by the controller through a pop-up:



12.3. Maintenance of the controller

To clean the front face of the equipment, use a soft cloth with water and non-abrasive liquids.

The ATyS C66 controller is conceived to be a maintenance free controller however, it is recommended to perform visual inspections periodically on the device, checking the connections, that the display screen is functional and the LED using the lamp test button and ensuring the correct functioning with the switching device and with any possible associated software.

As a best practice, perform at least one full cycle with your equipment (solution with the controller + transfer switch) every year.

The ATyS 66 together with a transfer switch shall be maintained in accordance with industry standards and as per instructions given by the manufacturer for the complete transfer switch.

As per NFPA 110 requirements for emergency and standby power systems the ATyS 66 used with a transfer switch should be inspected and should be exercised under load at least monthly.

Refer to the manufacturer's instructions for any manual, non-electric, offload operations recommended for service.

There are no user serviceable parts in the controller except for the RTC replaceable battery. In case of a malfunction, do not attempt to open the product and contact your local supplier. In this case the model, firmware version and serial number of the unit will be useful to provide and can be found inside the ABOUT menu as well as on the product labels and QR code on the rear side of the controller.

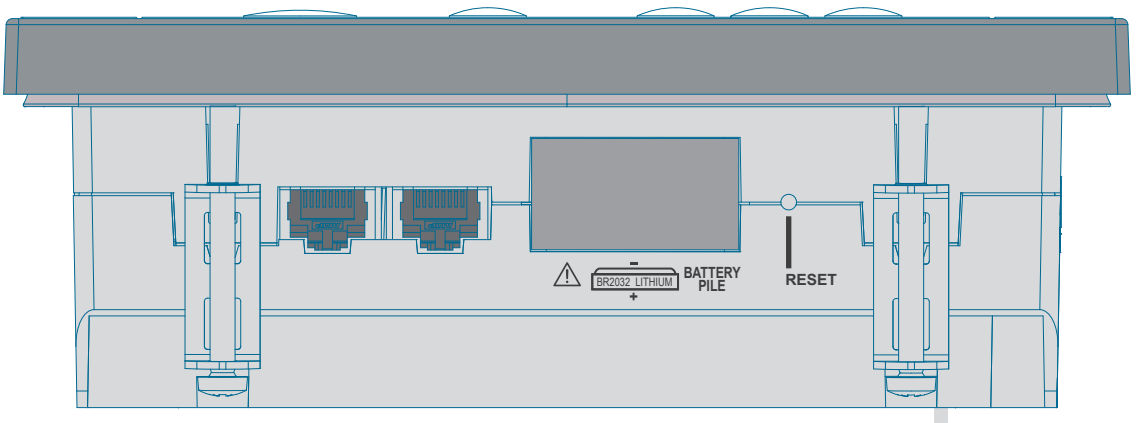
RTC Battery replacement

Depending on the working and environmental conditions the battery will need to be replaced when the controller displays a message "RTC Low Battery". A low battery may result in the time & date at power up to be incorrect.

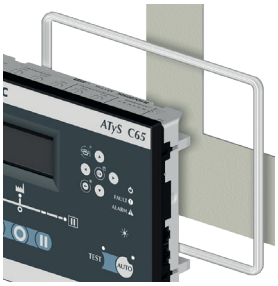
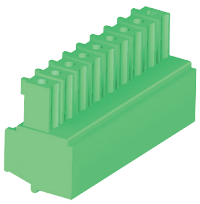
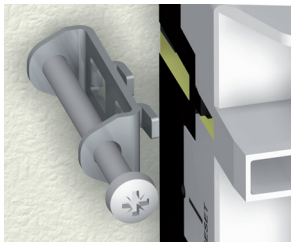
To replace the RTC battery:

1. Safely disconnect all power and voltage to the ATS controller
2. Disconnect all terminals from the controller
3. Release the cover on the side of the controller containing the battery
4. Remove the old battery with an appropriate plastic tool
5. Place the new battery on the correct side (polarity) in the holder from the pcb and push with the finger until it reaches the position of the old one.
6. Put back the plastic cover on the side of the controller and pressure slightly until it perfectly fits.
7. Connect back the terminals to the controller
8. Power up and adjust time and date

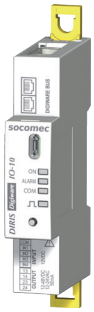
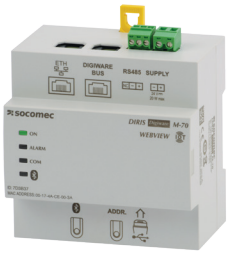
For battery replacement, use a BR2032 coin-type battery cell.



12.4. Spare parts

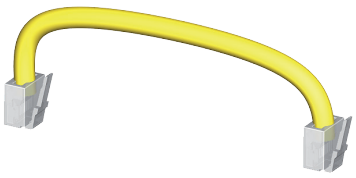
Part Number	Image	Description
1609 0001		IP65 silicon sealing gasket for door mounting in outdoors
1609 0002		Connector kit (including ATyS C66 but also ATyS FT/DT connectors that can be thrown away when using other technologies)
1609 0004		Controller mounting screws / Fixing clips (for door mounting) (kit of 4 units)
1609 0005		Controller mounting feet (for back plate mounting) (kit of 4 units)

12.5. Accessories and expansion modules

Part Number	Image	Description
4829 0140		DIRIS Digiware IO-10 for ATyS C65 4 Digital inputs + 2 Digital outputs expansion module A maximum of 6 modules can be connected to the controller
4829 0222		DIRIS Digiware M-70 communication gateway for Ethernet & Webserver
4829 0202		DIRIS Digiware D-70 communication gateway for Ethernet & Webserver and multi-product display
Consult Socomec		1A / 5A Current Transformers

For the connection between the controller and the accessories and between modules, a RJ45 Digiware cable is needed. There are different sizes available:

Length (m)	Quantity	Reference
0.1	1	**4829 0181**
0.2	1	**4829 0188**
0.5	1	**4829 0182**
1	1	**4829 0183**
2	1	**4829 0184**
5	1	**4829 0186**
10	1	**4829 0187**
50 m reel + 100 connectors		**4829 0185**

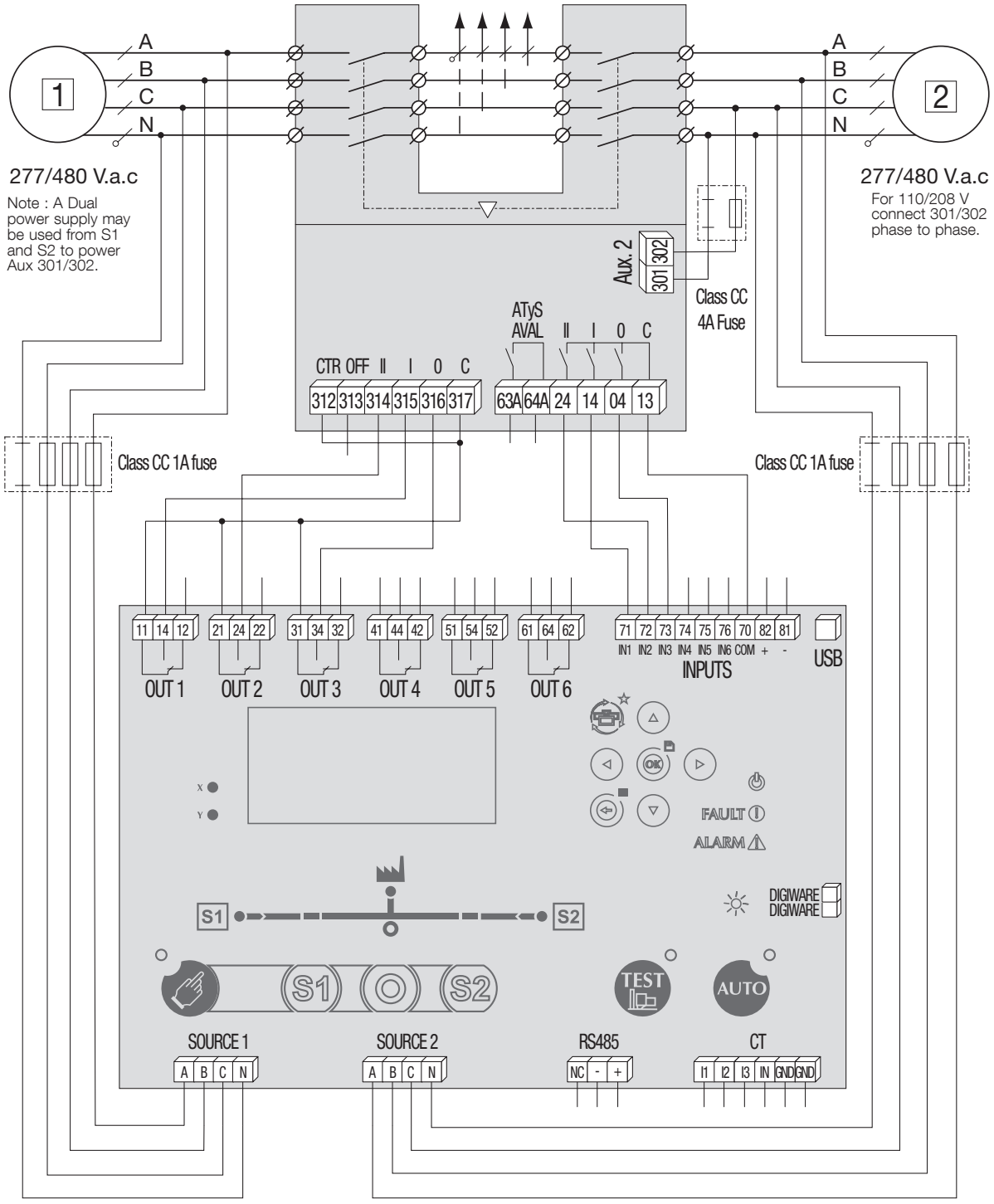


13. ANNEXES

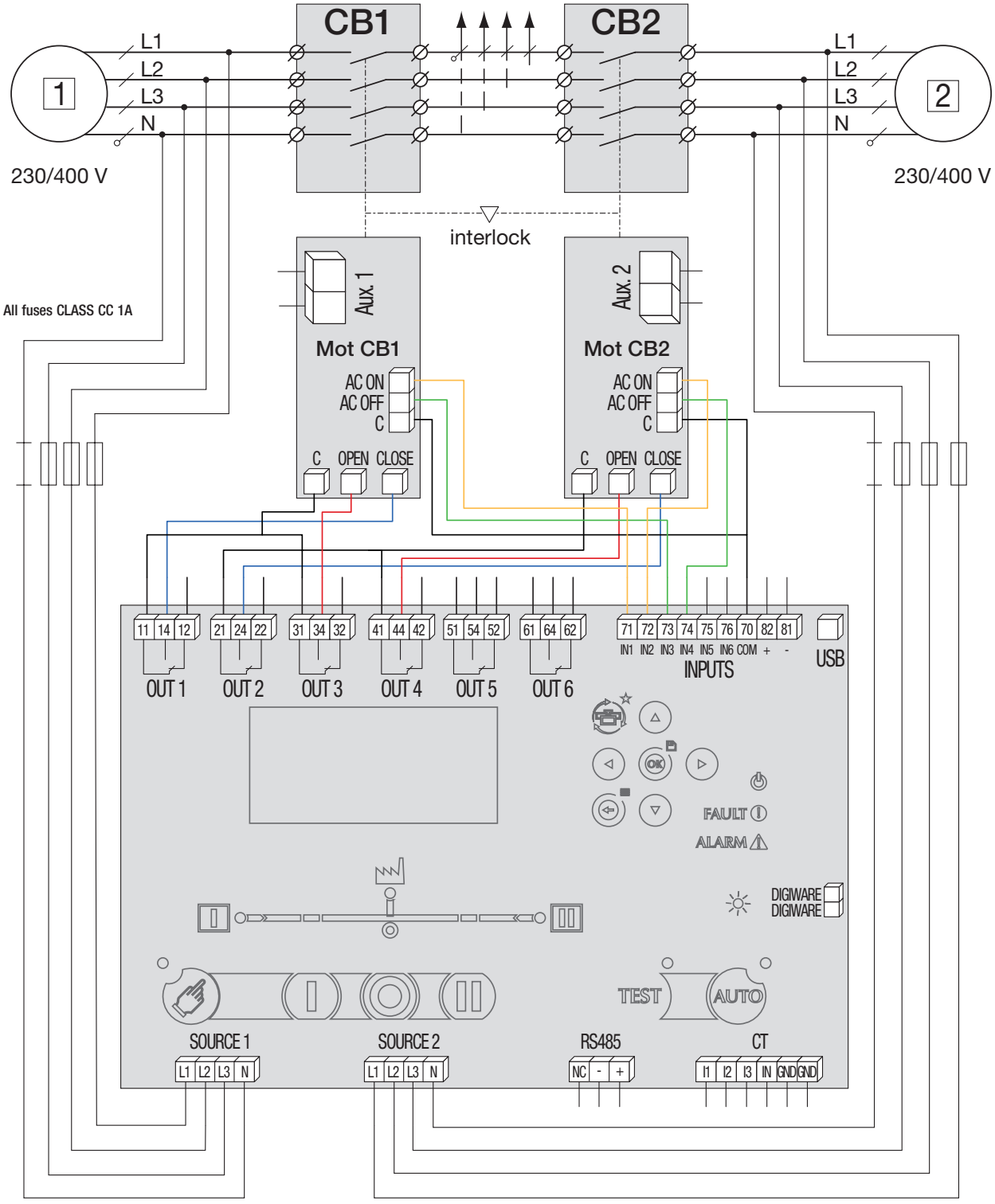
13.1. ANNEX I : Wiring Diagrams

The bellow diagrams detail the connections of the ATyS C66 with ATyS Switches as well as the generic wiring diagram for circuit breakers.

Connection diagram with ATYS UL



Connection diagram with Circuit Breakers



- Please consider Inputs and Outputs cabling are related to the configuration parameters.
- This schema corresponds to the ATS controller with presets for Circuit Breaker technology.
- The presets for each type of technology can be found in chapter 7.3.

Due to the numerous types of RTSE type CB (circuit breakers) available on the market, compatibility and specific wiring designs must be carried out and qualified by others.

13.2. ANNEX II : Timers list

These options can be configured in the Parameters / Timers menu:

OPERATION TIMERS

Trigram (ECS)	Timer	Description	Selectable range	By default
1FT	S1 FAILURE TIMER (s)	Source 1 Failure Timer: When source 1 is considered lost, 1FT is started. If source 1 is considered restored before the end of 1FT, the changeover sequence will not be engaged.	0-60sec	3sec
1RT	S1 RETURN TIMER (s)	Source 1 Return Timer: When source 1 returns, 1RT is started. At the end of 1RT, source 1 is then considered to be present. Should source 1 disappear before the end of 1RT, the changeover will not be carried out. In case the alternate source disappears during 1RT, the DYNAMIC TIMER (default 3s) delay will override the 1RT time setting value. ⚠ NOTE: this timer is only available if source 1 is a Utility, it is replaced by AVAILABILITY timer 1AT if source is a genset.	0-3600sec	180sec
2FT	S2 FAILURE TIMER (s)	Source 2 Failure Timer: When source 2 is lost, 2FT is started. If source 2 is restored before the end of 2FT, the changeover sequence is not started.	0-60sec	3sec
2RT	S2 RETURN TIMER (s)	Source 2 Return Timer: When source 2 returns, 2RT is started. At the end of 2RT, source 2 is then considered to be present. Should source 2 disappear before the end of 2RT, the changeover will not be carried out. ⚠ NOTE: this timer is only available if source 2 is a Utility, it is replaced by AVAILABILITY timer 2AT if source is a genset.	0-3600sec	5sec
1AT / 2AT	S1/S2 AVAILABILITY TIMER (s)	Source (1/2) Available Timer: Stabilisation time delay for voltage and frequency on Source (1/2) . 1/2AT starts as soon as the source voltage is above the hysteresis value. Transfer to Source 1/2 may be done at the end of this time delay. ⚠ NOTE: this timer is only available if source is a genset, it is replaced by RETURN timer 1RT / 2RT if source is a utility.	0-3600sec	180sec
DBT1/ DBT2	S1 or S2 DEAD BAND TIMER (s)	Dead Band Timer: This is the minimum electric dead time (blackout time) to respect when the source is lost or when transferring between source. This defines the minimum load supply downtime so as to allow residual voltages that may be generated by the load (such as motors) to decay.	0-20sec	3sec

GENSET TIMERS

Trigram (ECS)	Timer	Description	Selectable range	By default
1CT / 2CT	S1/S2 GENSET COOLDOWN (s)	Source 1 or 2 (Genset) Cool Down Timer: Following a return to prioritary source sequence, the genset on backup source is kept running for the 1CT/2CT timer duration. This is intended to cool down the genset (off load) before switching off.	0-600sec	180sec
1ST / 2ST	S1/2 START TIMEOUT (s)	Source 1 or 2 Genset start timeout delay: This time delay is started as soon as the genset start signal is given. Should source 1 or 2 not become available after timer 1ST/2ST has elapsed a “GENSET FAIL TO START” error message is displayed on the product LCD.	0-600sec	30sec
EET1	GENSET TIMEOUT S1 (h)	S1 maximum reset timer - Battery Charger maximum Off Timer. This timer defines the minimum time that the Genset must be switched off to activate the output EES (Battery Charger Signal). This doesn't involve any transfer, it's just to charge the genset batteries.	0-1100h	168h
EET2	GENSET TIMEOUT S2 (h)	S2 maximum reset timer - Battery Charger maximum Off Timer. This timer defines the minimum time that the Genset must be switched off to activate the output EES (Battery Charger Signal). This doesn't involve any transfer, it's just to charge the genset batteries.	0-1100h	168h
EDT1	BATTERY CHARGE DURATION S1 (s)	S1 Run timer (for batt charger). The output EES will be desactivated after this duration and battery charge will stop.	0-9999s	1800s
EDT2	BATTERY CHARGE DURATION S2 (s)	S2 Run timer (for batt charger). The output EES will be desactivated after this duration and battery charge will stop.	0-9999s	1800s

Note: in order to ensure a good operation, make sure that 1ST and 2ST timers are longer than 1AT and 2AT. Otherwise there will be a fault appearing on the screen saying “Fail to start”. This is due to the fact that the genset will always take longer to become available.

LOAD TESTS TIMERS

Trigram (ECS)	Timer	Description	Selectable range	By default
TOT (lim/ unlim)	LOAD TEST TYPE	Load test limited/unlimited	-	UNLIMITED
TOT	LOAD TESTS (s) - TIME / DURATION	Load test Duration Timer: This timer defines the On Load Test time. It starts counting when the Test is initiated. The return to the main supply takes place at the end of TOT. Note: TOT is configurable when TOT (LIM/UNL) above is set to LIM.	0-21600s	10s
T3T	LOAD TESTS END (s)	Load test – End Delay Timer: This time delay starts counting at the end of TOT Timer. The return to the main supply takes place at the end of T3T time.	0-1800s	5s
E1T	EXTERNAL LOAD TESTS PRE / BEFORE	External Order Load test - Start Delay Timer. This time delay starts at the same time as the External Load (EOL) order is received. At the end of this time delay, the Genset start order is activated. The load will be transferred to the Genset supply.	0-1800s	5s
E2T (lim/ unlim)	EXTERNAL LOAD TEST TYPE	External Load test limited/unlimited	-	UNLIMITED
E2T	EXTERNAL LOAD TESTS (s) - TIME / DURATION	External Order Load test - Duration Timer: This timer starts counting when the Test is initiated. The return to the main supply may initiate at the end of E2T time. Note: E2T duration timer is configurable in the timers menu when at least 1 input is configured as EOL and with E2T (UNL/LIM) set to UNL.	0-21600s	10s
E3T	EXTERNAL LOAD TESTS POST / AFTER	External Order Load test – End Delay Timer: This time delay starts counting at the end of E2T Timer. The return to the main supply takes place at the end of E3T time.	0-1800	5s

NO LOAD TESTS TIMERS

Trigram (ECS)	Timer	Description	Selectable range	By default
TFT (lim/unlim)	NO LOAD TEST TYPE	No load test limited/unlimited	-	UNLIMITED
TFT	NO LOAD TEST (s) - TIME / DURATION	No load test - Duration Timer: This time delay defines the Off Load Test time. It starts counting when the Test is initiated. Note: TFT is configurable in the timers menu when TFT (LIM/UNL) above is set to LIM.	0-21600s	600s
E5T	EXT NO LOAD TEST PRE / BEFORE (s)	External Order No load test - Start Delay Timer. This time delay starts at the same time as the External No Load Test (EOF) order is received. At the end of this time delay, the Genset start order is activated. The load will not be transfered to the Genset supply.	0-1800s	5s
E6T (lim/unlim)	EXT NO LOAD TEST TYPE	External No load test limited/unlimited	-	UNLIMITED
E6T	EXT NO LOAD TEST (s) - TIME / DURATION	External Order No load test - Duration Timer: This timer starts counting when the Test is initiated.	0-21600s	600s
E7T	EXT NO LOAD TEST POST / AFTER (s)	External Order No load test – End Delay Timer: This time delay starts counting at the end of E6T Timer. The Genset signal will switch at the end E7T.	0-1800s	5s

SPECIFIC FUNCTIONS TIMERS

FUNCTION	Trigram (ECS)	Timer	Description	Selectable range	By default
In-phase Transfer	IPT	DWELL TIMER / IN-PHASE TIMER	In-phase Timer: During this timer the in-phase parameters should be inside the accepted window of values to perform an in-phase transfer.	0 - 5 sec	500ms
In-phase Transfer	IPD	DWELL TIMER RESET / IN-PHASE RESEARCH DELAY	In-phase Timer: During this timer the controller will monitor the synchronism between the 2 sources to perform an in-phase transfer when the parameters are ok during the configured dwell timer.	0-1200s	180s
Go to center off	10T / 20T	S1 or S2 RETURN TO 0 (s)	Return to 0 timer: If no source available, time before going to 0 when "return 0" active from the source (S1 or S2)	0 - 10 sec	2s
Elevator	ELD	ELEVATOR Pre Transfer	Load control delay timer: If the output is used, the controller will send a signal to the load through the LOAD CTRL output the value of this timer (sec) before a transfer will take place.	0-9999s	5sec
Elevator	ELR	ELEVATOR Post Transfer	Load control reset timer: If the output is used, the controller will open the output to finish the signal to the load, the value of this timer (sec) after a transfer takes place to an available source.	0-9999s	5sec
Forced load shedding	LSD	LOAD SHEDDING PRE-TRANSFER TIMER (s)	Load Shedding - Time Delay (before transfer) Timer. This time delays corresponds to the time available to load shed before the secondary power is connected to the load of the ATS.	0-60s	4s
Forced load shedding	LSR	LOAD SHEDDING POST-TRANSFER TIMER (s)	Load Shedding - Time Delay (after transfer) Timer. This time delay corresponds to the time the load shedding output will remain active after retransferring to the prioritary source, before loading back the non-prioritary loads.	0-60s	1s
HVAC Compressor	DCT	HVAC COMPR. TIMER (s)	When going back to priority source position, first the associated output DCT (HVAC COMPRESSOR) contact (to shut down the compressor) before starting the transfer and when the switch reaches position, start a defined number of seconds timer before closing this output again. It avoids stressing the compressor.	0-3600s	20s
Tripping action	CH1/CH2	CHARGING TIME (s)	Time needed to charge the breaker 1/2 spring mechanism, during this time new orders to transfer will be placed on hold, these timers will be bypassed if the breaker charged inputs are activated.	0-15	0
Load adding	PreODx	PRE TRANSFER TIMER (s)	Timer to delay the transfer with all On delay outputs active. At the end of the timer the transfer will be initiated and the ON DELAY TIMERS will start counting.	0-99	0
Load adding	OD1-OD7	ON DELAY TIMER 1-7 (s)	Time after transfer for which the ON DELAY output will be active (up to 7 timers).	0-3600	Timer number x20s
Cycler	1CY/2CY	S1/S2 CYCLE DURATION (h)	Duration of a cycle for a source, at the end of the cycle the controller will initate a transfer based on transfer settings.	0-9999	1
Dynamic return timer	DRT	DYNAMIC RETURN TIMER (s)	The dynamic timer starts as soon as the source is present when it returns from a loss state (same time as 1RT). The Dynamic Timer allows bypassing the 1RT timer and replaces it by the dynamic timer in case 1RT is still counting and the current source is lost.	0-3600s	3s

13.3. ANNEX III – Input list

These options can be configured in the Parameters / I/O / Inputs menu:

TRIGRAM	INPUT NAME	Description
AC1	SWITCH IN POS.1 / BRK 1 CLOSED	Read position 1 from the RTSE
AC2	SWITCH IN POS.2 / BRK2 CLOSED	Read position 2 from the RTSE
AC0	SWITCH IN POS.0	Read position 0 from the RTSE
AC0A	SWITCH S1 IN POS.0 / BRK1 OPEN	Read position 0 from the SWITCH on S1
AC0B	SWITCH S2 IN POS.0 / BRK2 OPEN	Read position 0 from the SWITCH on S2
MAN	COVER OPEN	COVER OPEN This input is connected to the switch to inform the controller that the switch is in maintenance mode (door is open for servicing). The controller commands will be inhibited but navigation through the menu and dashboards on the display are allowed. This situation will remain until the input is cleared. Screen will show the following message when the input is activated "INHIBIT MODE COVER OPEN"
LCK	PADLOCKED	Product padlocked. Screen will show "INHIBIT MODE PRODUCT PADLOCKED" while the input is active. Controller goes to Inhibit mode until input is cleared. The controller commands will be inhibited but navigation through the menu and dashboards on the display are allowed.
IEE	INH. GENSET EX.	Inhibit Engine Exerciser: This input will inhibit the Engine Exerciser automatic functioning. All customized exercising programs will be bypassed and not take place whilst this input is active.
POP	RTSE AVAILABLE	Information coming from the RTSE to inform that the RTSE is operational.
PS1	GO TO POS.1	External order to go to pos 1 Position command only available if mode is in position CTRL. The last command received has priority.
PS2	GO TO POS.2	External order to go to pos 2 Position command only available if mode is in position CTRL. The last command received has priority.
PS0	GO TO POS.0	External order to go to pos 0 Position command only available if the mode is in position CTRL. Command 0 has priority over commands I and II.
RT0	RETURN TO 0	Overrides the "Return to 0" function inside SPECIFIC FUNCTIONS
BLK	BLOCKED	Product blocked, meaning that the RTSE is blocked, can't move. The controller will go into Partial Inhibition (starting the genset if necessary) but not transferring. Message on the display "Product blocked".
TP1	TRIP BRK1	Protection on S1 has tripped.
TP2	TRIP BRK 2	Protection on S2 has tripped.
REC	AUTO/MANU	Places the controller in manual mode remotely (can be used to activate the use of inputs "go to position X").
EST	EMERGENCY SIGN.	Emmergency off signal. Controller will pilot to go to position 0 (if any). CTRL will be disabled, AUTOMATIC mode will be off, genset won't be started, "Emergency Off" will be displayed on screen. If Lift/Elevator signal is enabled, its timers will be respected before giving the command to go to 0.
IPI	IN-PHASE INHIBIT	In-phase transfer inhibition: This input will disable the in-phase transfer function, so if the input is active it will disable the in-phase transfer between sources, allowing a transfer without taking into account the phase monitoring between sources.
IPB	IN-PHASE BYPASS	In-phase bypass: When this input is active (pulse), the switch will bypass the dwell time reset timer (sync-checking). This input can only be used when there is a in-phase checking already taking place.This input can only be taken into account after the In-phase delay timer is elapsed (DWELL TIMER RESET / IN-PHASE RESEARCH DELAY).
BCT	BYPASS TIMER	Bypass timer: Bypasses the current timer on the screen / first one of the list of timers running.
ELB	ELEVATOR BYPASS	It will bypass the load control delay timer (ELD) when active, if the elevator function is active.
IS1	INHIBIT S1	Inhibits source 1. Transfer to the source is forbidden and if the load is on that source it will immediately be transferred to the opposite

TRIGRAM	INPUT NAME	Description
IS2	INHIBIT S2	Inhibits source 2. Transfer to the source is forbidden and if the load is on that source it will immediately be transferred to the opposite
CH1	BREAKER 1 CHARGED	Gives feedback that the breaker mechanism is charged and ready to transfer.
CH2	BREAKER 2 CHARGED	Gives feedback that the breaker mechanism is charged and ready to transfer.
CTT	COMMIT	Activate the commit to transfer function when this input is active.
EGG	BACKUP GENGEN	Activates the backup Gen-gen mode if the application is set to "GEN-GEN"
CYC	CYCLER	Activates the cycler function
DIS1	BRK1 DISCONNECTED	Informs the controller that the breaker 1 is disconnected. When activated a pop-up will apear on the screen and automatic operation will be inhibited.
DIS2	BRK2 DISCONNECTED	Informs the controller that the breaker 2 is disconnected. When activated a pop-up will apear on the screen and automatic operation will be inhibited.
MS1	MTSE in position 1	Only for bypass technology indicates the the manual bypass switch is in position 1
MS0	MTSE in position 0	Only for bypass technology indicates the the manual bypass switch is in position 0
MS2	MTSE in position 2	Only for bypass technology indicates the the manual bypass switch is in position 2
WTH	Withdrawn	Only for bypass technology, indicates that the RTSE is withdrawn
CON	Connected	Only for bypass technology, indicates the the RTSE is connected
AACK	ALARM ACKNOWLEDGE	Acknowledges the alarm programmed in alarm menu.
-	NONE	INPUT NOT USED
INH	INHIBITION	Inhibition of the automatism. Mode inhibition (not automatic). CTRL is permitted. Genset won't start if the source is lost
INHp	PARTIAL INHIBITION	Inhibition of the automatism. Mode inhibition (not automatic). CTRL is permitted. Genset will start if the source is lost to ensure the supply of the controller, but it will not transfer.
INHt	TOTAL INHIBITION	Inhibition of the automatism. Mode inhibition (not automatic). CTRL is NOT permitted. Genset won't start if the source is lost
TON	TEST ON LOAD	Start test on load with dedicated test on load timers
TOF	TEST OFF LOAD	Start test off load with dedicated test off load timers
EON	EXT. LOAD	Remote on load test: If set to UNLIMITED, this order will start the cycle to transfer and the controller will not send an order to go back to preferred source until the signal is cleared. If set to LIMITED, a pulse on the input will start the test that will follow the E2T and other timers.
EOF	EXT. NO LOAD	Remote off load test: If set to UNLIMITED, this order will start the genset and stop the genset according to the external test off load configuration inside the parameters. If set to LIMITED, a pulse on the input will start the test that will follow the configured timers.
MRT	MANUAL RETRANS	Manual Retransfer to priority source (touching keypad or via INPUT) Remote transfer back to the priority source: This is the same function as "MANUAL RETRANSFER" cleared with the keypad. This variable in the PARAMETERS/SPECIFIC FUNCTIONS menu must be enabled to validate the operation through this input.
PRI	CHANGE PRIO	Changes the priority between sources
SS1	BYPASS STAB S1	Bypasses the stabilisation timer for S1 (S1 return timer)
SS2	BYPASS STAB S2	Bypasses the stabilisation timer for S2 (S2 return timer)

TRIGRAM	INPUT NAME	Description
ALE	EXT ALARM	External alarm active. It will be logged in the alarm log as External Alarm and the Alarm LED will be active. The alarm will be In progress until input is cleared
FTE	EXT FAULT	External fault active. The product will transfer to position 0 / center off. CTRL is permitted. Mode will be inhibit. Genset will not start if source is lost. "External Fault will be displayed on screen". It will be logged in the fault log as External Fault and the Fault LED will be active. The fault will be In progress until input is cleared and fault reset.
MSR	PRIO TEST ON LOAD	EJP / Stay on "backup" source. Priority Test on Load. Order to stay in S2 even if the source is lost or unavailable.
OA1	FORCE S1 AVAIL.	Force Source 1 as Available
OA2	FORCE S2 AVAIL.	Force Source 2 as Available
OU1	FORCE S1 UNAVAIL.	Force Source 1 as Unavailable
OU2	FORCE S2 UNAVAIL.	Force Source 2 as Unavailable
RST	RST FAULT STATE	Fault Reset : This input may be used to reset a fault condition after the fault has been cleared. Faults may also be reset through communication or through the display.
LSB	BYPASS LSD	Bypasses the load shedding pre-transfer timer. Consequence is that load is considered as shed so transfer can take place. It'll immediately load shed.
CHP	CHANGE POSITION	Changes the position (if no priority defined). It partially inhibits when active. It goes back to Auto when cleared. It has to be a permanent maintained input, it can't be an impulse.
CIH	CONDITIONAL INHIBITION	In Main-Main mode only, this input function allows users to inhibit the controller except if the main source is lost, in which case the controller will resume normal operation and switch over to secondary source automatically (will also start the genset if secondary source is a genset).

Annexe 13 - 4. Output list

These options can be configured in the "Parameters" > "I/O" > "OUTPUTS" menu:

TRIGRAM	OUTPUT NAME	Description
PO1	POS 1 ORDER / CLOSE BRK1	Switch position order to go to Source 1
PO2	POS 2 ORDER / CLOSE BRK2	Switch position order to go to Source 2
PO0	POS 0 ORDER	Switch position order to go to Position 0 (center off)
PA0	POS 0 ORDER S1 / OPEN BRK1	Switch position order to go to center-off (source 1)
PB0	POS 0 ORDER S2 / OPEN BRK2	Switch position order to go to center-off (source 2)
S1A	S1 AVAILABLE	Source 1 available: Output activated if source 1 is considered as available (see conditions of availability in the dedicated chapter of the manual).
S2A	S2 AVAILABLE	Source 2 available: Output activated if source 2 is considered as available (see conditions of availability in the dedicated chapter of the manual).
SCA	ANY SOURCE AVAIL.	Source 1 OR source 2 available: This output is activated when at least one source (S1 or S2) is available.
S1U	S1 UNAVAIL.	Source 1 unavailable: Output activated if source 1 is not considered as available (see conditions of availability in the dedicated chapter of the manual) or the source has been inhibited.
S2U	S2 UNAVAIL.	Source 2 unavailable: Output activated if source 2 is not considered as available (see conditions of availability in the dedicated chapter of the manual) or the source has been inhibited.

TRIGRAM	OUTPUT NAME	Description
AC1	S1 CLOSED	Source 1 closed: This output has the function of an auxiliary contact. When the controller has the input from the switch to be in source 1, the output will be active. This also considers the case where with no real information about the position, the controller works in blind mode.
AC2	S2 CLOSED	Source 2 closed: This output has the function of an auxiliary contact. When the controller has the input from the switch to be in source 2, the output will be active. This also considers the case where with no real information about the position, the controller works in blind mode.
AC0	OFF POSITION	Both sources open (center-off): This output has the function of an auxiliary contact. When the controller has the input from the switch to be in center-off, with both switches open, the output will be active. This also considers the case where with no real information about the position, the controller works in blind mode.
LO1	S1 CLOSED + AVAIL	Load being supplied by source 1: When active, it indicates that source 1 is supplying the load and within the availability operating range. Source 1 has to reach the availability conditions.
LO2	S2 CLOSED + AVAIL	Load being supplied by source 2: When active, it indicates that source 2 is supplying the load and within the availability operating range. Source 2 has to reach the availability conditions.
LSC	FORCED SHEDDING	Active when transferring to source 2 to shed loads by connecting this output to the open order on a circuit breaker or motorised switch. The function Forced Load Shedding has to be active on the specific functions menu.
FLT	FAULTS ACTIVE	At least 1 fault is active on the controller. Fault report
POP	PROD. OPERATIONAL	Information about the availability and correct functioning of the ATSE. The input POP should be enabled and linked to the availability output of the RTSE.
LCK	PRODUCT LOCKED	Report of padlocking of the product.
COP	CTRL OPERATIONAL	Controller operational: This output will be active while the controller is supplied, with no critical faults active and with the required conditions to perform an automatic operation when needed.
TOS	TEST ON LOAD	This output is activated if a load test (thought the HMI) is ongoing.
EOS	EXT TEST ON LOAD	This output is activated if a load test (remote order) is ongoing.
ROS	(EXT) TEST ON LOAD	This output is activated if any load test (either HMI or remote order) is ongoing.
PTS	SMART SHEDDING	Output active while the smart load shedding is active. To work, the "Smart Load Shedding" function has to be enabled inside the Specific functions menu.
EES	BATTERY CHARGER	Output to activate the battery charging. It is linked to the battery charger timmers.
TPP	TRIP PARTIAL	Report of protection tripping in one of the sources.
TPT	TRIP TOTAL	Report of protection tripping on both sources.
IPT	IPT IN PROGRESS	In Phase Transfer ongoing.
CO1-CO6	COPY INPUT x	Active when the corresponding input will be active
EEA	SCHEDULER ACTIVE	This output will be active while any of the programs for the Engine exerciser are active. The settings of the exerciser parameters can be configured in the dedicated menu.
ELV	LOAD CONTROL	Load control signal output. It should be linked to the load in order to load shed before transferring and reactivate the load after transfer.
ARO	ALARM REPORT	This alarm output will be active in the case that one of the alarms set in the Alarms menu is active and the option to use the output to report the alarm is enabled.
DCT	HVAC COMPRESSOR	When going back to principal source position the contact will become active prior to starting the transfer (to shut down the compressor), then the transfer will take place and then after reaching the opposite source, a timer defined in the specific functions menu will elapse before deactivating this output again. It avoids stressing the compressors in HVAC chillers.
-	NONE	OUTPUT NOT USED

TRIGRAM	OUTPUT NAME	Description
GS1	GENSET S1 START	Genset start/stop output. Only available on OUT 5 when the source is a generator (when configured as Genset/Genset) or on OUT 6 (when configured as Main/Genset with priority on S2).
GS2	GENSET S2 START	Genset start/stop output. Only available on OUT 6 when the source is a generator.
AUD	CRIT. ALM. ACTIVE	Output active when an alarm with the criticity CRITICAL is active
PHI	PHASE INVERSION	Output activated if the phase rotation measured is different from the one configured in APPLICATION
OD1-OD7	ON DELAY	Outputs linked to the "on delay timers"
ARO	ALM REPORT	Reports the alarm configured in the alarm menu.
PRL	bypass	Bypass only, output report to signal that the bypass is in parralel mode (bypass and ATSE active).
TST	bypass	Bypass only, output report to signal that the bypass is in test mode.
EMG	bypass	Bypass only, output report to signal that the bypass is bypassed by emergency manual switch.
NRM	bypass	Bypass only, output report to signal that the bypass is bypassed by nomal manual switch.
NIA	NOT IN AUTO	Outputs to indicate that the controller is NOT in Auto (same functioning logic as LED)
WMRT	WAIT MAN RETRANSF	This output is active when the controller is waiting for a manual retransfer (user confirmation to retransfer when “MANUAL RETRANSFER” function is active)
FP0	POS 0 NOT REACHED	Output active when order to go to position 0 has been sent but the product has not transferred
FP1	POS 1 NOT REACHED	Output active when order to go to position 1 has been sent but the product has not transferred
FP2	POS 2 NOT REACHED	Output active when order to go to position 2 has been sent but the product has not transferred
FO1	FAILED TO OPEN S1	Output active when order to open S1 has been sent but the product has not transferred
FO2	FAILED TO OPEN S2	Output active when order to open S2 has been sent but the product has not transferred
FC1	FAILED TO CLOSE S1	Output active when order to close S1 has been sent but the product has not transferred
FC2	FAILED TO CLOSE S2	Output active when order to close S2 has been sent but the product has not transferred

Note: position orders cannot be used with the OUT 5 and OUT 6 (latching relays).
The latching relays can take up to 2 seconds between opposite orders (NO to NC or NC to NO) and for added security when starting a genset will change state based on the timers or when the backup power is exhausted.

13.5. ANNEX V - ATyS C66 Technical characteristics

Mechanical features	
Casing type	Fitted on a door (6.3x8.66 in / 160x220 mm) or back-plate
Case material	PC (Polycarbonate)
Protection degree	NEMA 3R 12 when mounted with the gasket IP65 front panel /IP30 without gasket/ IP20 rear panel
Screen resolution	350x160 pixels – 8 lines of text
Weight	2.4 lb / 1085gr (controller without spare parts)
AC Power	
Rated voltage	120/208/230/240/277/400/480
Operating limits	110-480VAC (+-20%)
Frequency	50-60Hz +-10%
Drawn/Dissipated power	<10W
Recommended fuses	CLASS CC 1A
DC Power	
Rated battery voltage DC Aux supply for IO modules	12-24VDC +/-20% 24VDC
Reverse polarity protection	yes
Maximum drawn current	3A peak <10ms
Recommended fuses	1 A Class CC
Voltage sensing	
Ue max. Rated voltage	480Vac
Ui (according 60947-1)	600Vac
Measuring range limits	50-576Va
Frequency range limits	45-66Hz
Measurement type	True RMS (TRMS)
Sample rate	9,6kHz
Measurement input impedance	6MΩ
Accuracy (V, U)	0,5%
Accuracy (f)	0,1%
Current measurement (with external current transformers)	
Ie rated current (secondary)	Negative
Measuring range	6A max
Measurement type	True RMS (TRMS)
Permanent thermal limit	5A max
Current Accuracy	1%
Power Accuracy	2%
Active Energy Accuracy	1%
Digital Inputs	
Input type	1A or 5A
Input current	2.3mA at 24Vdc
Low input signal	Let input floating for low signal
High input signal	Link input with common to impose High level
Input signal delay	<200ms

Outputs OUT 5-6	
Output type	latching / form C relay
Operating time	<30ms
Contact type	Volts free configurable NO/NC
Rating	AC1 8A 277Vac 50/60Hz AC15 2A 277Vac 50/60Hz DC1 5A 24Vdc
Outputs OUT 1-4	
Output type	Non-Latching type
Operate time	<30ms
Contact type	Volts free configurable NO/NC
Rating	AC1 8A 277Vac 50/60Hz AC15 2A 277Vac 50/60Hz DC1 5A 24Vdc
RTC	
Battery type	Coin type cell (BR2032)
Battery voltage	3V
Battery lifetime (Average, depends on usage conditions)	6 years
RS485	
Interface type	2 to 3 half duplex wires
Protocol	MODBUS RTU
Baudrate	programmable 1200-115200 bps
Function	Configuration and data reading
Isolation	Functional
Maximum distance	3937 ft / 1200m @9600 baud 656 ft / 200m @115200 baud
Termination	internal 120 ohms (selectable DIP switch)
DIGIWARE BUS	
Function	Connection between ATyS C66 and external modules
Cable type	Specific cable with RJ45 connections
Environmental specifications	
Ambient operating temperature	-22 ... +158 °F / -30° … +70°C
Storage temperature	-40 ... +158°F / -40° … +70°C
Operating humidity	130°F / 55°C / 95% HR
Operating altitude	<2000m
Vibrations	IEC 60947-1
Shocks	shocks according to Annexe Q IEC 60947-1
EMC classification	Class A+B
Insulation / Overvoltage cat.	
Impulse V withstand	Uimp=4kV. Test = 8kV between sources/6kV between phases
Installation overvoltage category	OVC III
Degree of pollution	Pollution degree 3
USB	
Connection	USB 2
Type	Type B Micro USB
Protocol	Modbus RTU on USB

Mechanical characteristics	
Height*length*depth in / mm	9.45x7.09x2.52 / 240x180x64
Weight	2.4 lb / 1085gr
Event recorder	
Capacity	3000 events
Data storage	non-volatile memory
Type tests L'ensemble des essais CEM sont décrits dans la sequence 4 947-1	
Electrostatic Discharge Immunity - Air	8kV (B)
Electrostatic Discharge Immunity - Direct	4kV (B)
Radiated RF Immunity	10V/m
Electrical Fast Transient / Burst Immunity	2kV power access, 1kV signal access
Surge Immunity	1kV diff
Conducted RF Immunity	10Vrms
Radiated RF Emmision	Class B
Conducted RF Emmision	Class B
Case	
Fire reaction of housing and cover	self-extinguishing UL94-V0
Service life components	
MTBF	>100yr

Note:
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

13.6. ANNEX VI - FULL MENU Architecture

MENU	SUBMENU 1	SUBMENU 2	SUBMENU 3
DASHBOARD (not in menu)	MIMIC STATUS METERING POWER AND ENERGY* TIMERS ALARMS I/O		
CONTROL PWD: 4000	MODE / POSITION	MODE CHANGE POSITION GENSET SOURCE 1 GENSET SOURCE 2	
	TEST	LOAD TEST NO LOAD TEST	
	MANUAL RETRANSFER	PRESS OK FOR MANUAL RETRANSFER	
EVENTS PWD: 4000	EVENT LOG		
	EVENT BY DATE*		
	ALARM LOG	IN PROGRESS HISTORY	
PWD: 1000	FAULT LOG	IN PROGRESS HISTORY PRESS OK TO RESET FAULTS	
PWD: 4000	STATISTICS	(S1, S2, GENSET, CYCLES, OPERATIONS, HOURS)	
"GENSET SCHEDULER PWD: 4000"	GENERAL PARAMETERS	GENSET IDLE TIMEOUT (min)	
	CUSTOM 1	TYPE SET PERIODIC SCHEDULE TEST DURATION (s) START DATE START TIME	
	CUSTOM 2*	TYPE SET PERIODIC SCHEDULE TEST DURATION (s) START DATE START TIME	
	CUSTOM 3*	TYPE SET PERIODIC SCHEDULE TEST DURATION (s) START DATE START TIME	
	CUSTOM 4*	TYPE SET PERIODIC SCHEDULE TEST DURATION (s) START DATE START TIME	

MENU	SUBMENU 1	SUBMENU 2	SUBMENU 3
PARAMETERS PWD: 1000	NETWORK	AUTODETECT	
		SETUP.	POLES & WIRES
			NOMINAL VOLTAGE
			NOMINAL FREQUENCY
			PHASE ROTATION
			PHASE ROTATION CHECK
			VT USED
			VT PRIMARY
			VT SECONDARY
		APPLICATION	SWITCH TECHNOLOGY
			APPLICATION TYPE
			SOURCE 1
			SOURCE 2
			SOURCE PRIORITY
			LOGIC
			LOAD TEST PRIORITY
			REMOTE LOAD TEST PRIORITY
			RETRY NUMBER
			RETRY DELAY (ms)
			PULSE LENGTH (ms)
		OPERATING RANGE S1	S1 OVERVOLTAGE FAIL (%)
			S1 OVERVOLTAGE RESTORE (%)
			S1 UNDERVOLTAGE FAIL (%)
			S1 UNDERVOLTAGE RESTORE (%)
			S1 UNBALANCE FAIL (%)
			S1 UNBALANCE RESTORE (%)
			S1 OVERFREQUENCY FAIL (%)
			S1 OVERFREQUENCY RESTORE (%)
			S1 UNDERFREQUENCY FAIL (%)
			S1 UNDERFREQUENCY RESTORE (%)
		OPERATING RANGE S2	S2 OVERVOLTAGE FAIL (%)
			S2 OVERVOLTAGE RESTORE (%)
			S2 UNDERVOLTAGE FAIL (%)
			S2 UNDERVOLTAGE RESTORE (%)
			S2 UNBALANCE FAIL (%)
			S2 UNBALANCE RESTORE (%)
			S2 OVERFREQUENCY FAIL (%)
			S2 OVERFREQUENCY RESTORE (%)
			S2 UNDERFREQUENCY FAIL (%)
			S2 UNDERFREQUENCY RESTORE (%)
	LOAD*	SETUP	LOAD TYPE
			RATED CURRENT
			LOAD NAME
			CT PRIMARY
			CT SECONDARY
			NEUTRAL CT PRIMARY
			NEUTRAL CT SECONDARY
			CT Phase A Polarity
			CT Phase B Polarity
			CT Phase C Polarity
			CT Neutral Polarity

MENU	SUBMENU 1	SUBMENU 2	SUBMENU 3
PARAMETERS PWD: 1000	DISPLAY	SCREEN	LANGUAGE
			INTENSITY
			TIMEOUT
		DATE AND TIME	DATE FORMAT
			DATE SEPARATOR
			DATE
			TIME
		OPTIONS	TEST BUTTON USE
			LAMP TEST DURATION (s)
		CHANGE ATS NAME	ATS NAME:
	TIMERS	OPERATION	S1 FAILURE (s)
			S1 RETURN (s)
			S1 RETURN TO 0 (s)
			S2 FAILURE (s)
			S2 RETURN (s)
			S2 RETURN TO 0 (s)
			DEAD BAND (s)
		GENSET SOURCE 1	S1 GENSET COOLDOWN (s)
			S1 START TIMEOUT (s)
		GENSET SOURCE 2	S2 GENSET COOLDOWN (s)
			S2 START TIMEOUT (s)
		TESTS ON LOAD	TEST ON LOAD
			TEST ON LOAD (s)
			TEST ON LOAD END (s)
			EXT TEST ON LOAD PRE (s)
			EXT TEST ON LOAD
			EXT TEST ON LOAD (s)
			EXT TEST ON LOAD POST (s)
		TESTS OFF LOAD	TEST OFF LOAD
			TEST OFF LOAD (s)
			EXT TEST OFF LOAD PRE (s)
			EXT TEST OFF LOAD
			EXT TEST OFF LOAD (s)
			EXT TEST OFF LOAD POST (s)

MENU	SUBMENU 1	SUBMENU 2	SUBMENU 3
PARAMETERS PWD: 1000	I/O	INPUTS	INPUT1
			INPUT2
			INPUT3
			INPUT4
			INPUT5
			INPUT6
			INPUT 1 TYPE
			INPUT 2 TYPE
			INPUT 3 TYPE
			INPUT 4 TYPE
			INPUT 5 TYPE
			INPUT 6 TYPE
		OUTPUTS	OUTPUT1
			OUTPUT2
			OUTPUT3
			OUTPUT4
			OUTPUT5
			OUTPUT6
			OUTPUT 1 TYPE
			OUTPUT 2 TYPE
			OUTPUT 3 TYPE
			OUTPUT 4 TYPE
			OUTPUT 5 TYPE
			OUTPUT 6 TYPE
		EXTERNAL I/O DETECTION*	
		EXTERNAL I/O CONFIG*	List of Avalable IO10 Modules
	COMMUNICATIONS	MODBUS ADDRESS	ADDRESS:
		RS458 MODBUS	BAUDRATE:
			STOP:
			PARITY:
		DIGIBUS COMM*	BAUDRATE:
			STOP:
			PARITY:
		DIGIWARE MODE*	MODE
	ALARMS	MEASURE ALARMS CONFIG*	ALARM ID
			STATUS
			CATEGORY
			SOURCES
			PARAMETERS
			UPPER THRESHOLD (A/10)
			LOWER THRESHOLD (A/10)
			HYSTERESIS
			ACK METHOD
			ACK INPUT
			OUTPUT REPORT
			CRITICITY

MENU	SUBMENU 1	SUBMENU 2	SUBMENU 3
PWD: 1010	ALARMS	MAINTENANCE ALARMS CONFIG	ALARM ID
			STATUS
			TYPE
			UPPER THRESHOLD (A/10)
			ACK METHOD
			ACK INPUT
			OUTPUT REPORT
			CRITICITY
PWD: 1000		COMBINATION ALARMS CONFIG*	ALARM ID
			STATUS
			CRITICITY
			LOGIC
			ALARM 1 TYPE
			ALARM 1 INDEX
			ALARM 2 TYPE
			ALARM 2 INDEX
			ACK METHOD
			ACK INPUT
			OUTPUT REPORT
		LOGICAL ALARMS CONFIG	ALARM ID
			STATUS
			LOGICAL INPUT
			ACK METHOD
			ACK INPUT
			OUTPUT REPORT
			CRITICITY
		SYSTEM ALARMS CONFIG	ALARM ID
			STATUS
			ACK METHOD
			ACK INPUT
			OUTPUT REPORT
			CRITICITY
	PASSWORD	CHANGE OPERATOR PWD CHANGE CONFIG PWS CHANGE MAINTENANCE PWD	
	WIZARD	FULL WIZARD STARTS	

MENU	SUBMENU 1	SUBMENU 2	SUBMENU 3
"SPECIFIC FUNCTIONS PWD: 1000"	MANUAL RETRANSFER	MANUAL RETRANSFER	
	INPHASE TRANSFER*	STATUS	
		DELTA VOLTAGE (V)	
		DELTA FREQUENCY (1/10Hz)	
		DELTA ANGLE (°)	
		IPT TIMER (ms)	
		IN PHASE RESEARCH DELAY (s)	
	GO TO CENTER	GO TO CENTER OFF	
		S1 RETURN TO 0	
		S2 RETURN TO 0	
	LIFT CONTROL*	STATUS	
		PRE TRANSFER TIMER (s)	
		POST TRANSFER TIMER (s)	
	FORCED LOAD SHEDDING*	STATUS	
		PRE TRANSFER TIMER (s)	
		POST TRANSFER TIMER (s)	
	SMART LOAD SHEDDING*	S1 AUTO LOAD SHED	
		S2 AUTO LOAD SHED	
		S1 AUTO LOAD SHED RESTORE	
		S2 AUTO LOAD SHED RESTORE	
	POWER UP IN AUTO	POWER UP IN AUTO	
	DBT TIMER IN CTRL*	DBT TIMER IN CTRL	
	HVAC COMPRESSOR*	STATUS	
		HVAC COMPRESSOR TIMER	
MAINTENANCE PWD: 1010	REBOOT DEVICE		
	ERASE LOGS	RESET ALARM LOG	
		RESET EVENT LOG	
	RESET COUNTERS	RESET SWITCH COUNTERS	
		RESET POS PARTIAL TIME COUNTERS	
		RESET PARTIAL OP HOURS COUNTERS	
		RESET GENSET STATS	
	INSPECTION MODE	DATE	
		TIME	
	INTRODUCE PHONE NUMBER	ENTER PHONE NUMBER	
	ENERGY BACKUP	ENERGY BACKUP	
"ABOUT (no PWD)"	PRODUCT NAME		
	LAST INSPECTION		
	SERIAL NUMBER		
	FIRMWARE VERSION		
	COMM ADDR		
	MAINTENANCE TEL		

13.7. ANNEX VII - Communications table

Find your product Modbus communication registers online at www.socomec.com

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