INSTRUCTION MANUAL EN

ATyS C66

ATS Controller

www.socomec.com
To download, brochures, catalogues and technical manuals:

socomec
Innovative Power Solutions

EN 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	WARNING	CAUTION
RISK: Electric shock, burns, death	RISK: Possible personal injury	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.

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

3. QUICK START

socomec
Innovative Power Solutions

549349C

QUICK START EN

ATyS C66

c UL us LISTED

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/O 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)

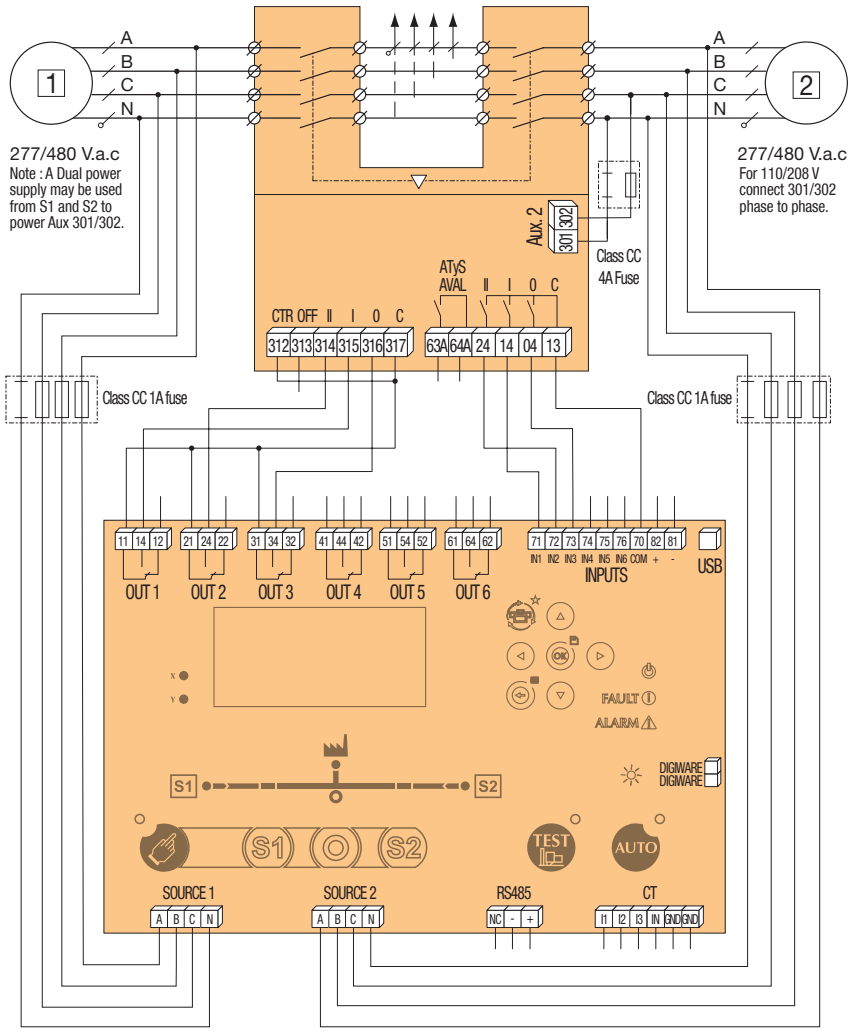
www.socomec.us
To download, brochures, catalogues and technical manuals

UL61010
Non contractual document.
Subject to change without notice.

Installation and Commissioning

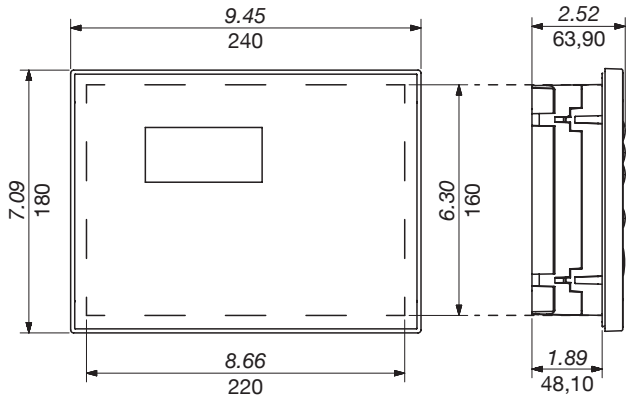
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Installation	Connections	Configuration	Visualization	Menus & programming

Connection diagram with ATYS UL



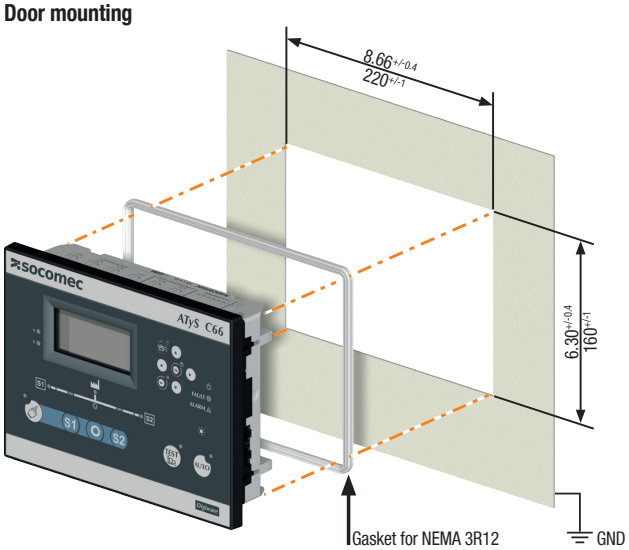
STEP 1A Product dimensions

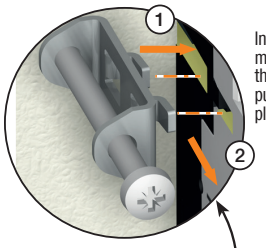
Dual Dimensions
in/mm



STEP 1B Mounting & connecting controller

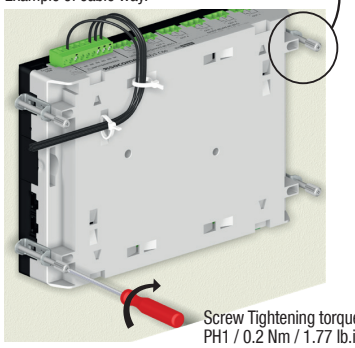
Door mounting





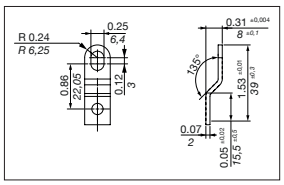
Insert the 4 door mounting screws in the designated slot and push back to lock in place.

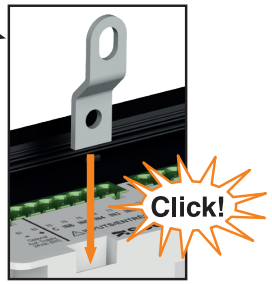
Example of cable way.



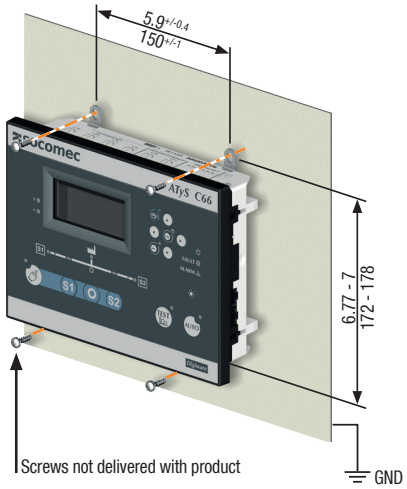
Screw Tightening torque
PH1 / 0.2 Nm / 1.77 lb.in

Backplate mounting

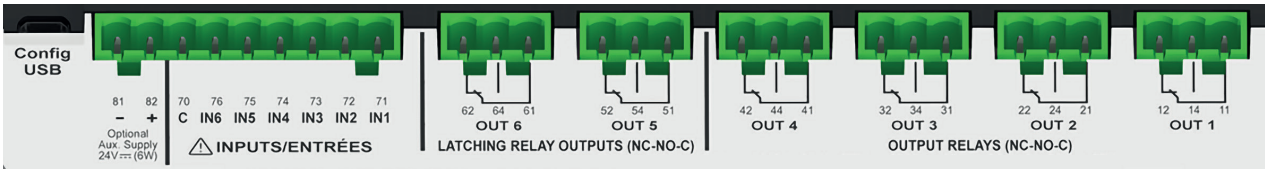




Clip the mounting feet in the designated slot



STEP 2 Controller wiring



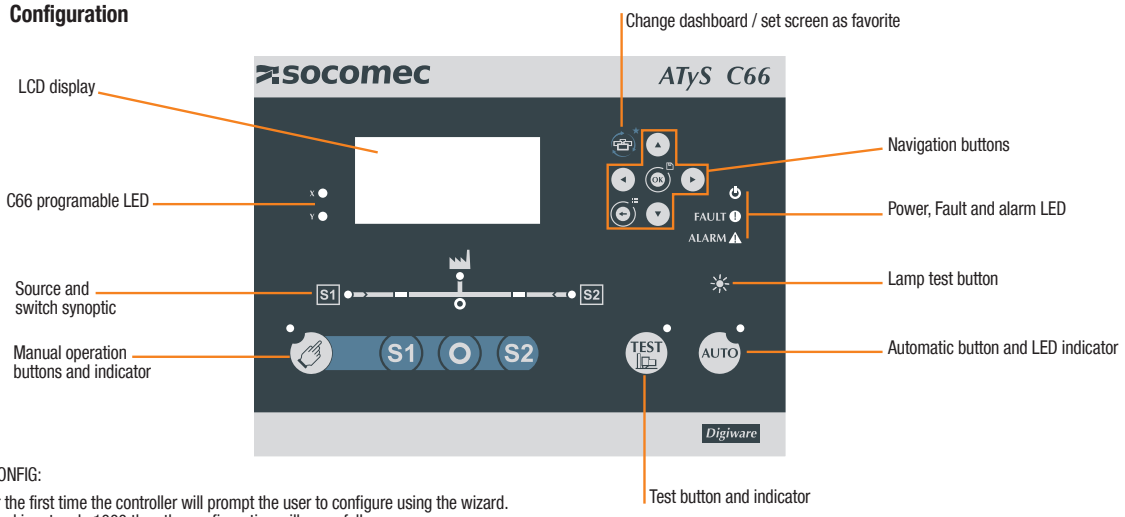
Top view

Bottom view

type	Terminal N°	Description	Characteristics	Recomended cross section
Inputs	71	IN1: programmable input	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		
	73	IN3: programmable input		
	74	IN4: programmable input		
	75	IN5: programmable input		
	76	IN6: programmable input		
	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: reserved (switch ODR1)	Dry contacts 8A / 277 VAC 50/60 Hz 5A / 24 VDC	
	22/24/21	OUT2: reserved (switch ODR2)		
	32/34/31	OUT3: programmable output		
	42/44/41	OUT4: programmable output		
Latching relays	52/54/51	OUT 5: programmable latching relay		
	62/64/61	OUT 6: genset start relay		
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

STEP 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.

STEP 4 Visualization

1	SYNOPTIC
<1.1>	STATUS
<1.2>	METERING
<1.3>	INFORMATION

2	STATUS
<2.1>	STATUS
<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.

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

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

STEP 5 Menus & programming

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

MAIN MENU
- CONTROL
- LOG
- ENGINE EXERCISER
- PARAMETERS
- SPECIFIC FUNCTIONS

CONTROL
- MODE/POSITION
- TEST
- MANUAL RETRANSFER

LOG
- EVENT LOG
- EVENT BY DATE
- ALARM LOG
- FAULTS
- STATISTICS

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

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

SPECIFIC FUNCTIONS
- MANUAL RETRANSFER
- INPHASE TRANSFER
- RETURN TO 0
- ELEVATOR CONTROL
- FORCED LOAD SHEDDING
- SMART LOAD SHEDDING
- POWER UP IN AUTO
- HVAC COMPRESSOR

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

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

LOAD
- LOAD STATUS
- LOAD TYPE
- INOM
- LOAD NAME
- CT PRIMARY
- CT SECONDARY
- NEUTRAL CT PRIMARY
- NEUTRAL CT SECONDARY
- LINE I1 WAY
- LINE I2 WAY
- LINE I3 WAY
- LINE I4 WAY

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

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

ALARMS
- MEASURE ALARMS CONFIG
- MAINTENANCE ALARMS CONFIG
- COMBINATION ALARMS CONFIG
- LOGICAL ALARMS CONFIG
- SYSTEM ALARMS CONFIG

TIMERS
- OPERATION
- GENSET SOURCE 1
- GENSET SOURCE 2

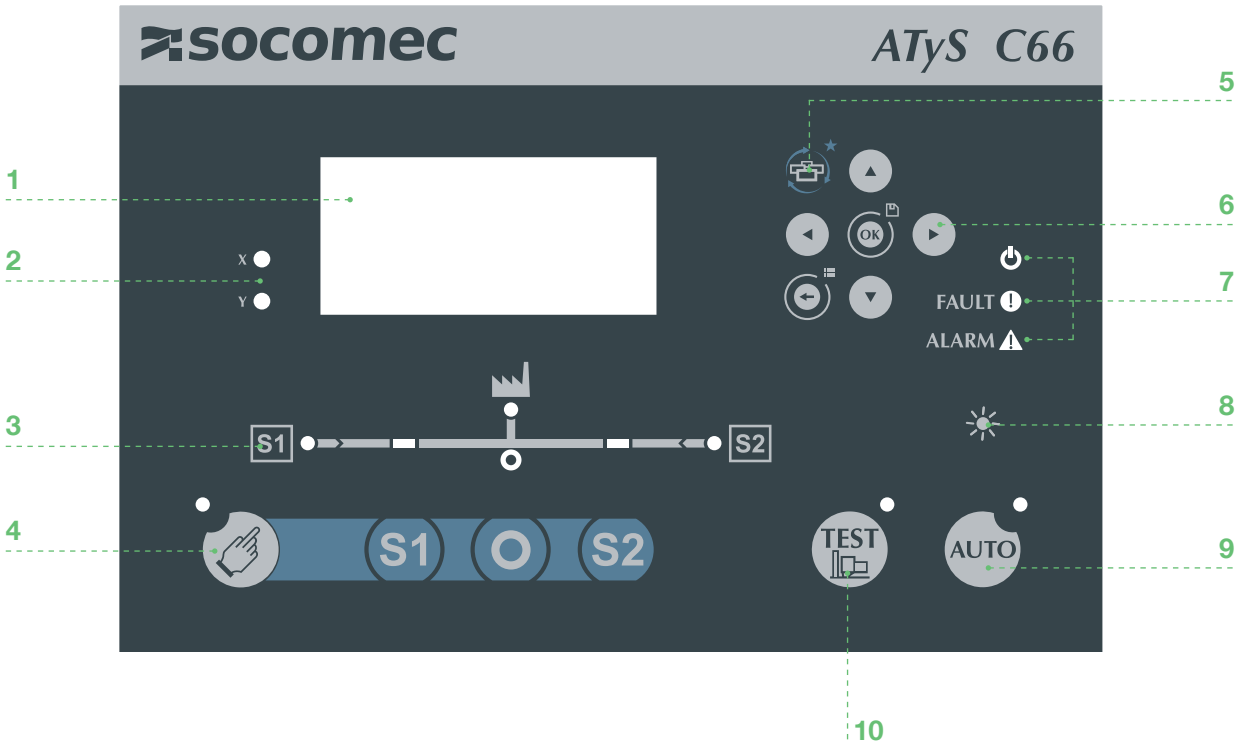
PASSWORDS
- CHANGE OPERATOR PWD
- CHANGE CONFIG PWD
- CHANGE MAINTENANCE PWD
- BACK

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

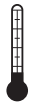
The ATyS C66 controllers meet the following environmental requirements:

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

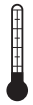
- 95% humidity without condensation at 130°F (55° C).

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

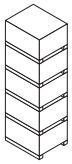
- Recommendation: to be stored in dry, non-corrosive and non-saline atmospheric conditions.

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)

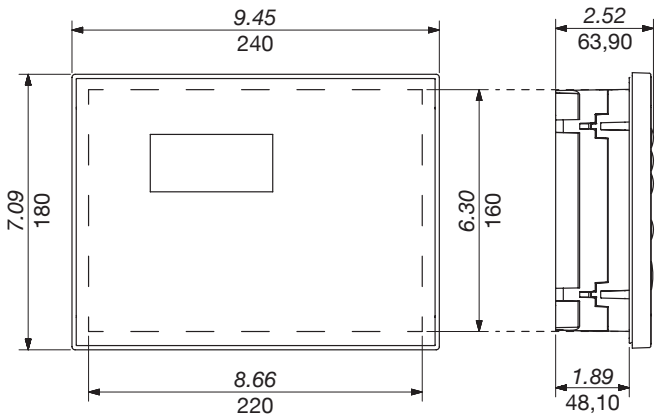
Conforms to the requirements of:

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.

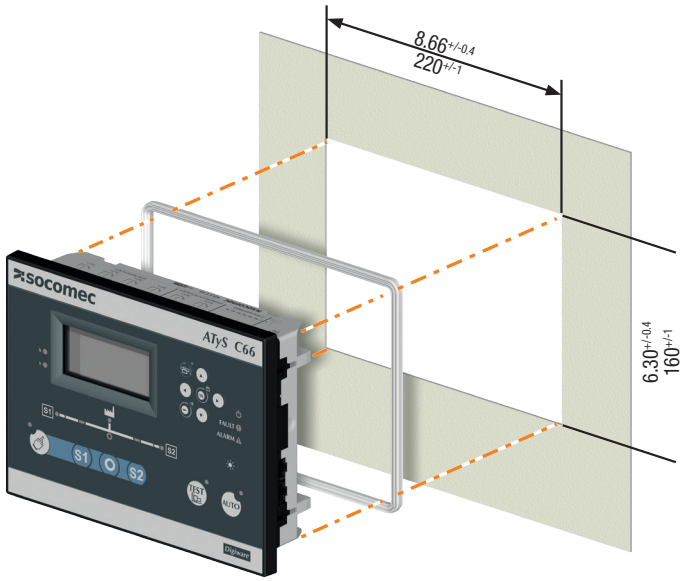
(Both mounting accessory kits are delivered with the product).

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

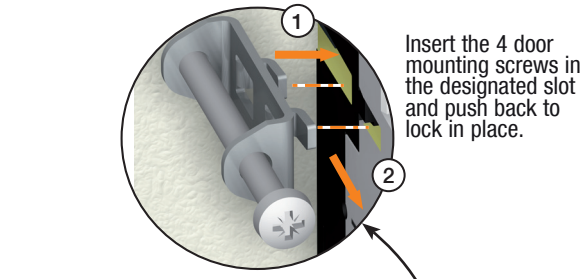
Cut a rectangle hole of 220x160mm / 8.66 x 6.3in on the enclosure door as shown below.



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

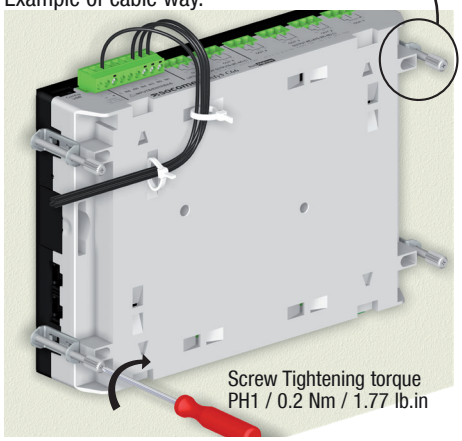
STEP 2: Fixing the controller on the door:

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.



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

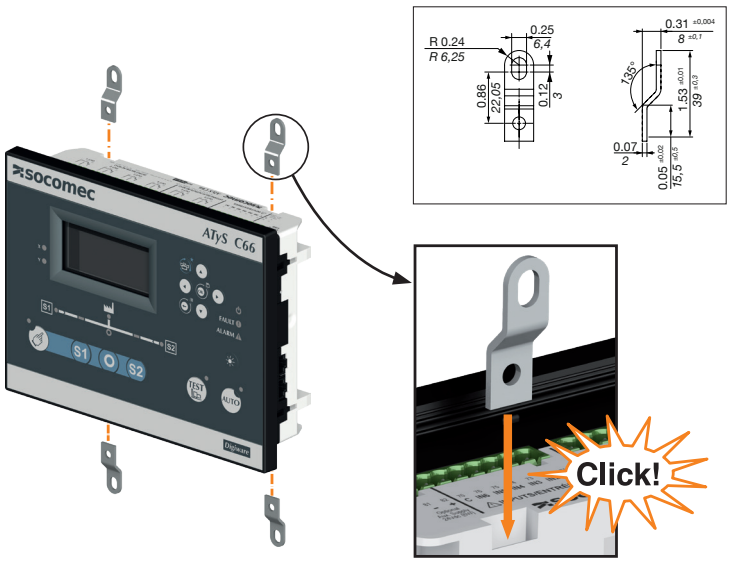
Example of cable way.



7.2.2. Backplate mounting

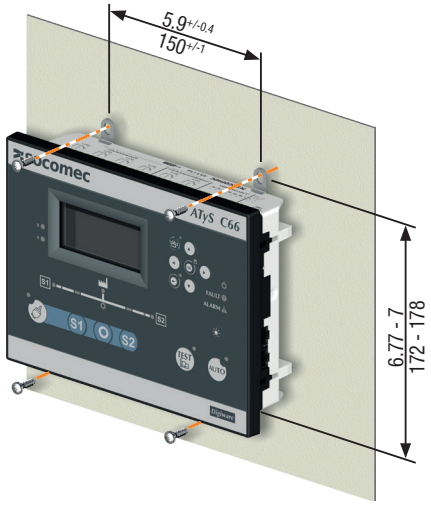
STEP 1: Placing the 4 mounting legs on the controller

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.



Note 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**:

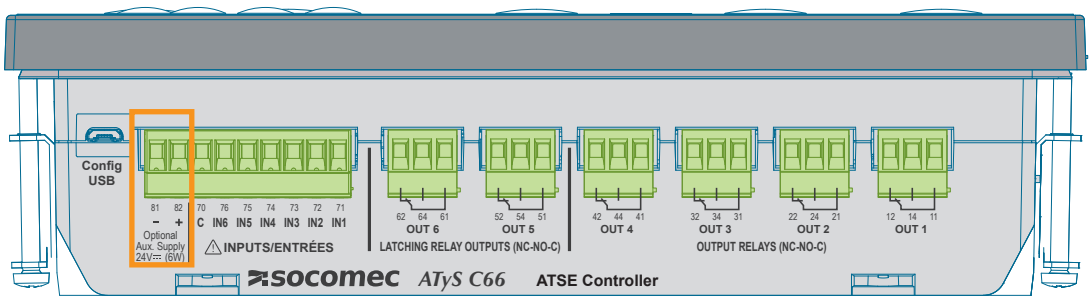
IO input/output modules

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.

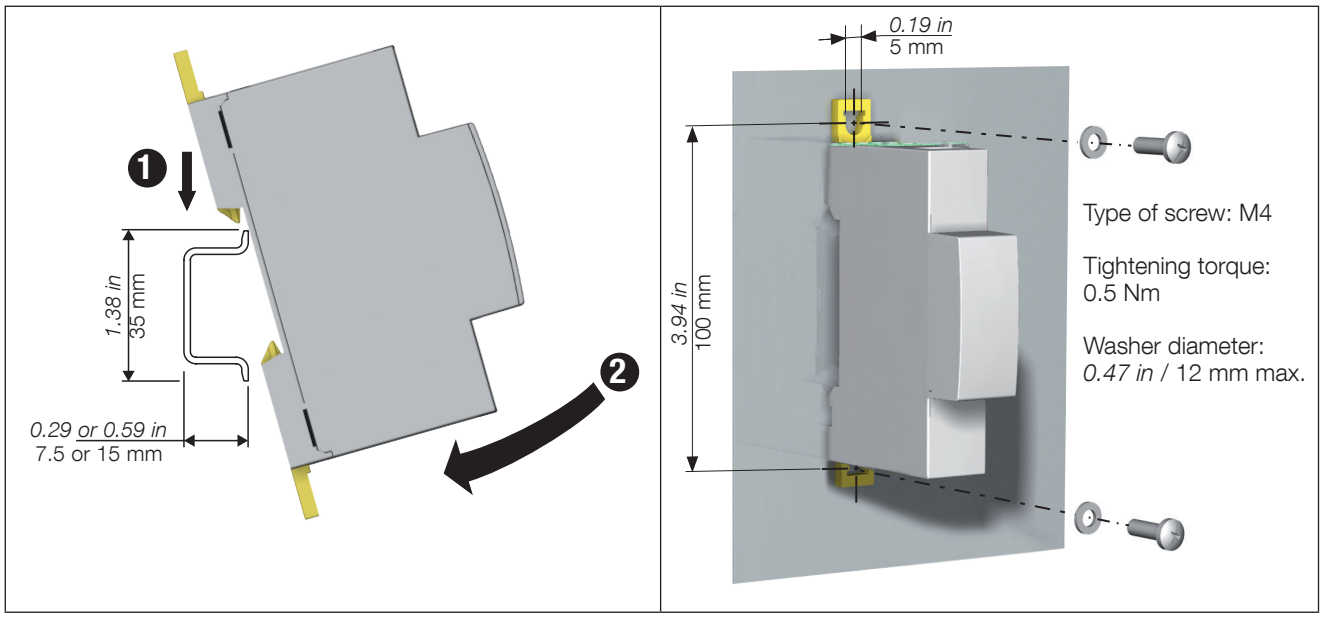


An end-of-the-bus resistor is necessary for a correct communication between the modules and the controller:

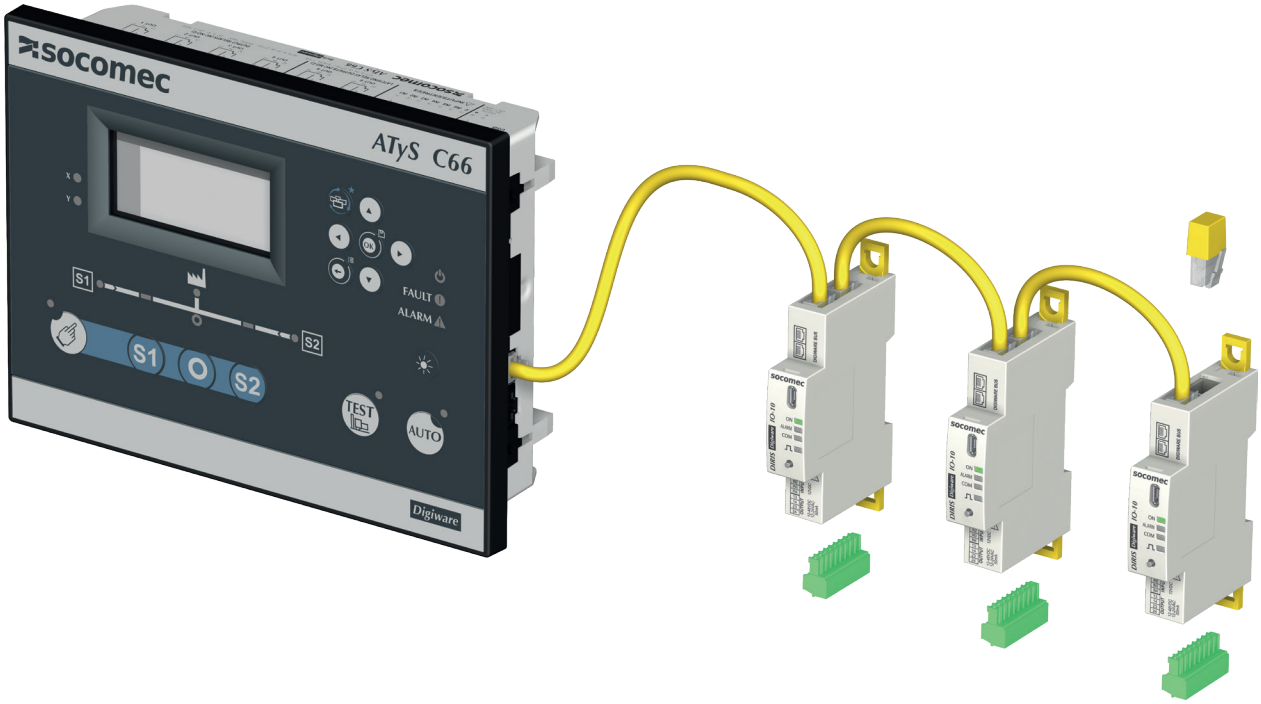
	Quantity	Part number
	1	**4829 0180**

Mounting the I/O modules:

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

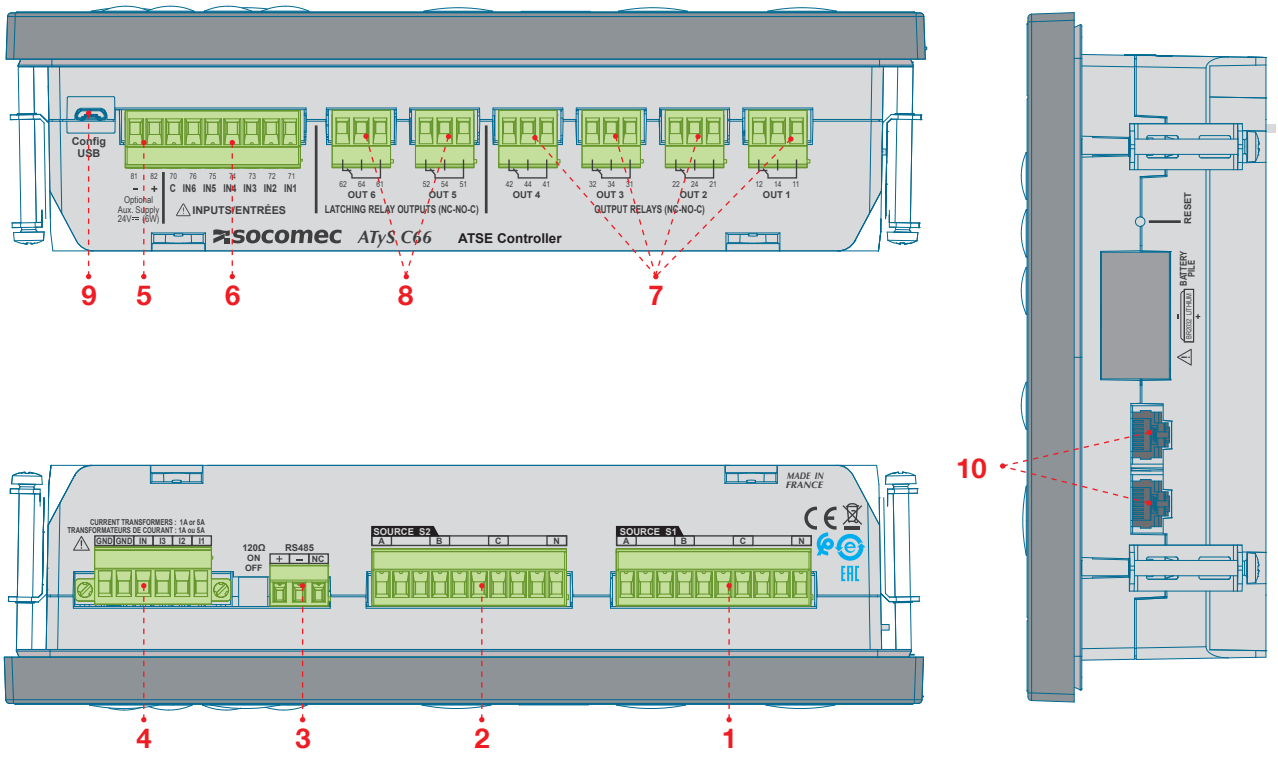


The connection between modules and to the ATyS C66 Digiware input is on the side of the controller by means of an RJ45 connector and after this the other modules are daisy chained (up to 6 modules).



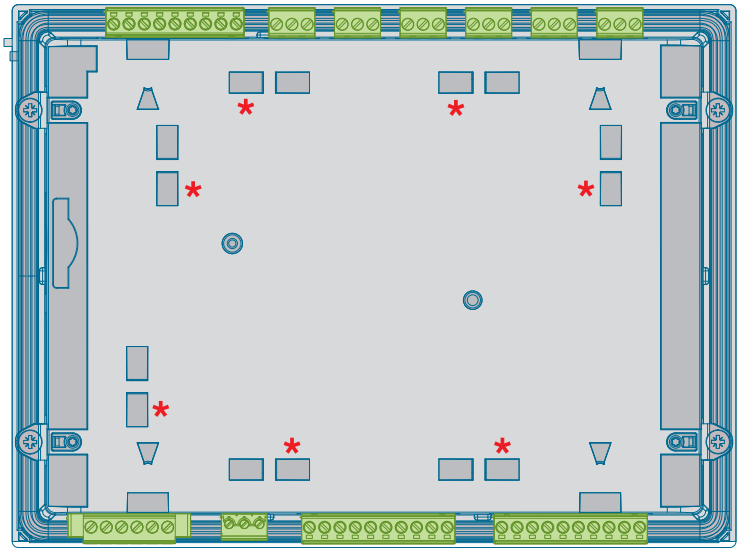
7.3. Terminal Connections

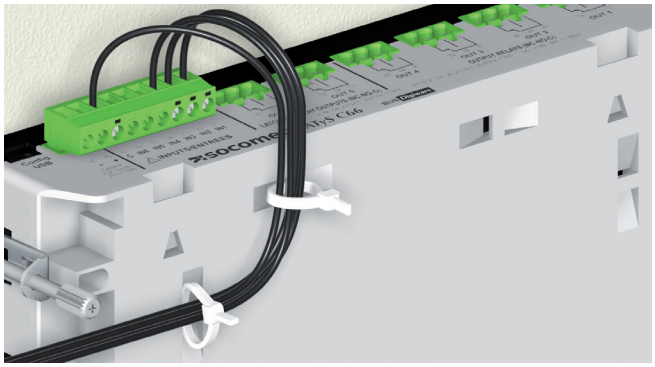
Top / Side / Bottom views:



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
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	1 - 2,5 mm² AWG 18-14
		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 / 30-14 AWG Tightening torque 0,22 -0,25 Nm 1.9-2.2 Lb.in
		-	DATA - (B)		
		NC	Ground		
4	CURRENT TRANSFORMERS (use listed current transformers)	I1 /Ia	CT phase 1 / A	CT Input /1A or /5A	1,5-2.5mm² AWG 16-14 Tightening torque 0,5-0,6 Nm 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	
		82	+		
6	PROGRAMMABLE INPUTS	70	COMMON	Do no connect to any power supply. To be used with dry contacts	
		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	
		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	MicroUSB	USB 2.0 for configuration	-	MicroUSB Type B
10	DIGIWARE BUS	BUS	2x RJ45 DIGIWARE BUS	CAT V - 600V RJ45 UTP	RJ45 DIGIWARE CABLE

* Impulse voltage withstand tests at 6kV between phases of the same source and 8kV between phases of a different source.

Note 1 Use 0.28 in / 7mm as stripping length for the controller terminals.

Note 2 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.

Note 3 Use UL listed current transformers for current and energy monitoring.

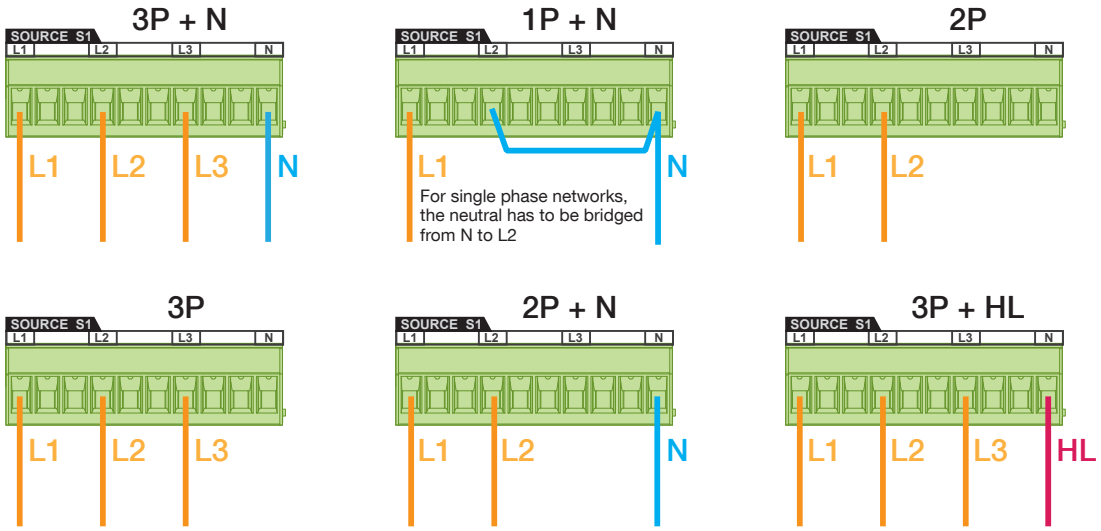
7.3.1. Power Supply

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:



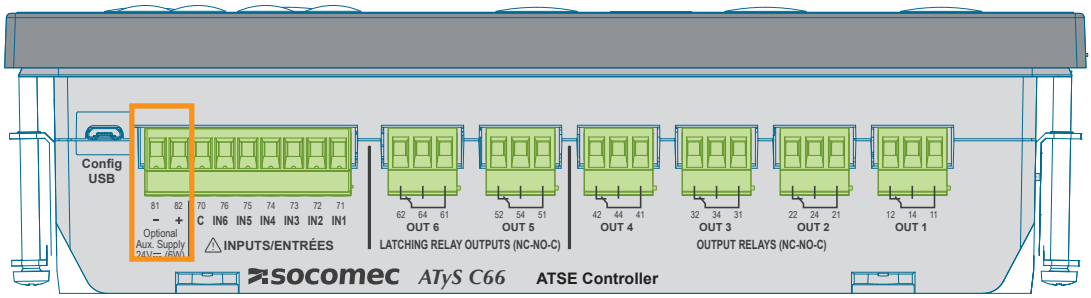
Note The C66 standalone ATS controller must include a SCPD such as fuses on each phase of the voltage sensing control wiring. Class CC 1A fuses are recommended.

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 for the utilization of the controller, but necessary in case of using extension modules (I/O module).
- **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.

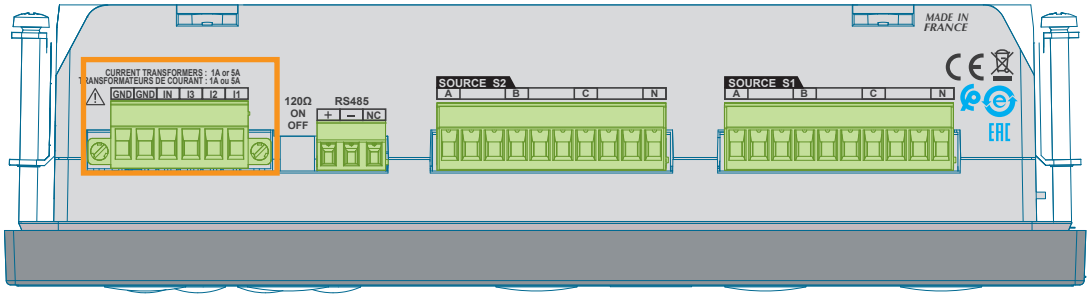
Note After these 15-30 seconds, the relays outputs and the inputs will no longer be operational and the 2 latching relays (OUT5 and OUT6, contacts 51-54 and 61-64) will automatically change state to start the generator(s) using their own latching relay backup power.

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%

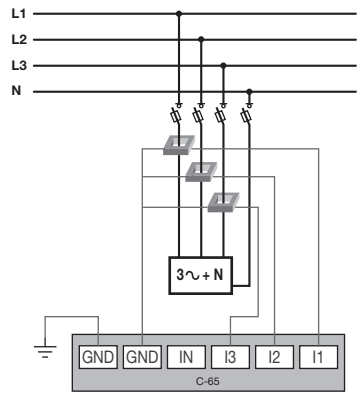
Recommended cable cross sectional area: AWG 16 (1,5mm²).



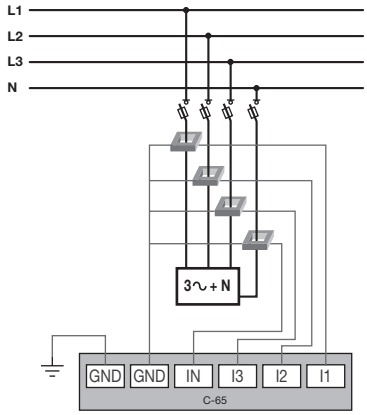
The configuration for the measurement should be done in the Parameters/Load menu (see chapter 11.1.2).

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

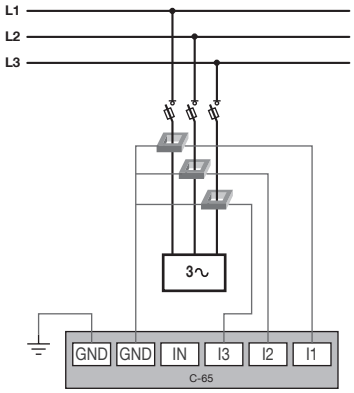
3P + N – 3CT



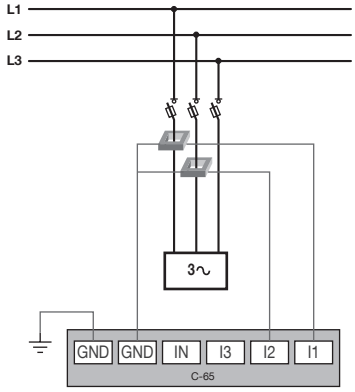
3P+N – 4CT



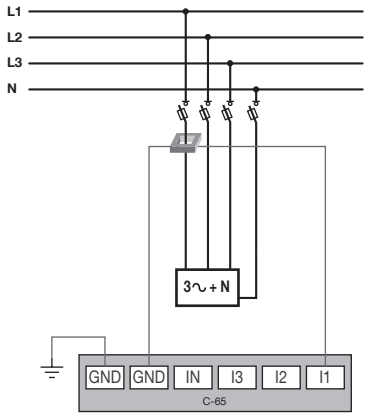
3P – 3CT



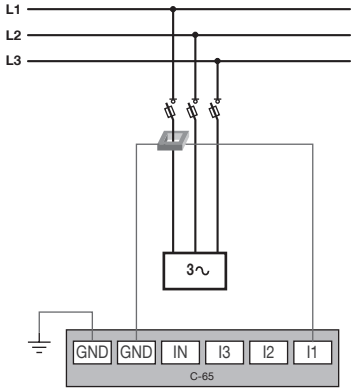
3P – 2CT



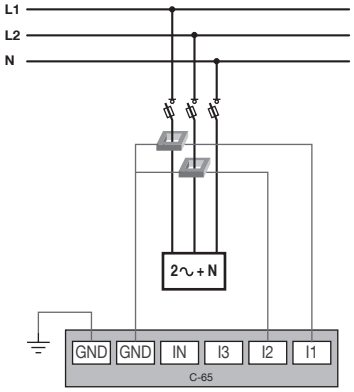
3P + N – 1CT



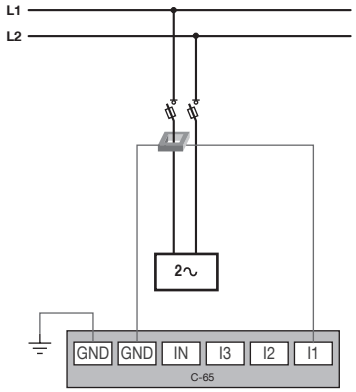
3P – 1CT



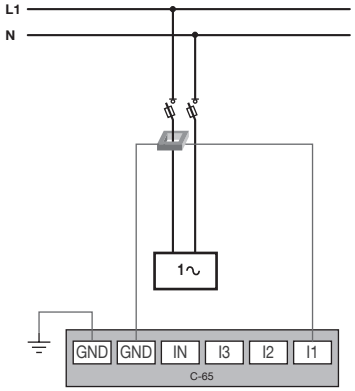
2P + N – 2CT



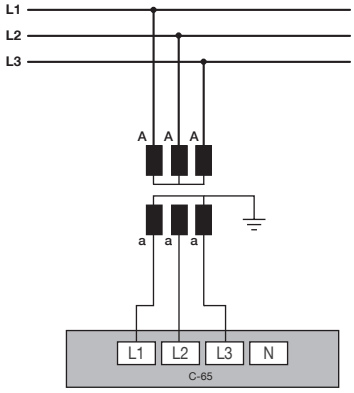
2P – 1CT



1P + N – 1CT

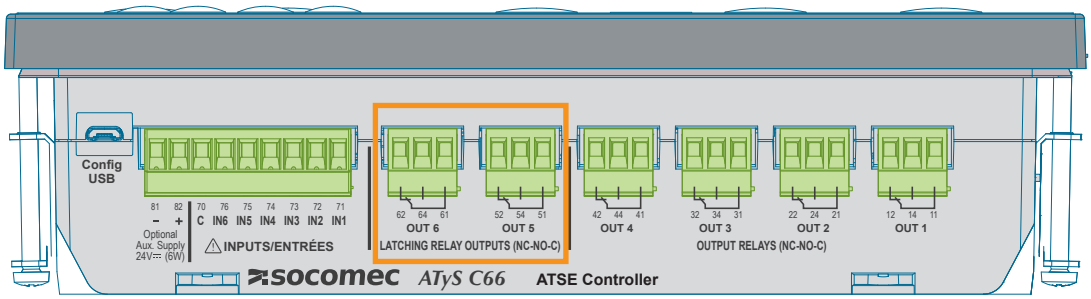


VT - VOLTAGE TRANSFORMER



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	SWITCH IN POS 1	SWITCH IN POS 1	SWITCH IN POS 1
	Input 2	SWITCH IN POS2	SWITCH IN POS2	SWITCH IN POS2	SWITCH IN POS2	SWITCH IN POS2
	Input 3	DOOR OPEN	SWITCH A IN POS 0	SWITCH A IN POS 0	-	SWITCH IN POS0
	Input 4	INHIBIT S1	SWITCH B IN POS 0	SWITCH B IN POS 0	-	-
	Input 5	INHIBIT S2	-	-	-	-
	Input 6	-	-	-	-	-
OUTPUTS	Output 1	POS 1 ORDER	POS 1 ORDER	POS 1 ORDER	POS 1 ORDER	POS 1 ORDER
	Output 2	POS 2 ORDER	POS 2 ORDER	POS 2 ORDER	POS 2 ORDER	POS 2 ORDER
	Output 3	Faults Active	POS 0 ORDER S1	POS 0 ORDER S1	-	POS 0 ORDER
	Output 4	FORCED SHEDDING(1)	POS 0 ORDER S2	POS 0 ORDER S2		
	Output 5	LIFT[1]	-	-	-	-
	Output 6	GENSET START	-	-	-	-
	Logic	Impulse[2]	Impulse	Impulse	Maintained	Impulse

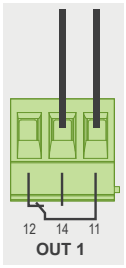
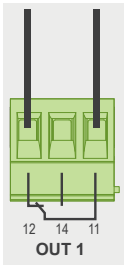
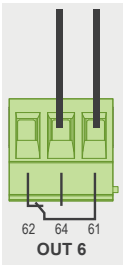
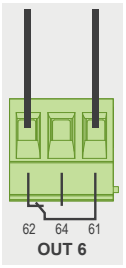
[1] See chapter specific functions for more details.
[2] Impulse duration and length and number of retries can be configured in "NETWORK"=>"APPLICATION".

IMPORTANT NOTE

For use with ATyS DT , POS 0 means "Center OFF", SWITCH A IN POS 0 Means source 1 opened, SWITCH B 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.

For utilisation with circuit breakers, POS 1 ORDER means closing breaker in S1 and POS 2 ORDER means closing breaker in S2. The POS 0 ORDER S1(2) orders mean opening the breakers (in S1 or S2 accordingly). SWITCH A IN POS 0 means the breaker S1 is open and SWITCH B IN POS 0 means the breaker S2 is open.

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	Open	Closed
	ON (activated by firmware)	Open	Closed	Closed	Open
	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.

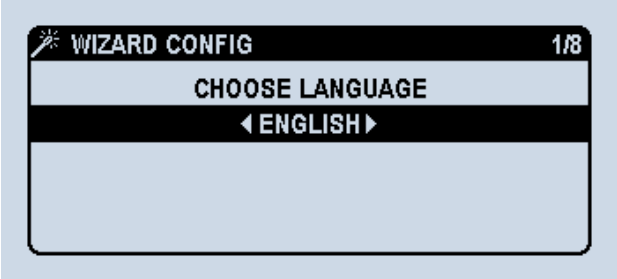
CAUTION **It is highly recommended to cable the outputs 5 and 6 as NO (Normally Open) to benefit from the above feature.**

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:

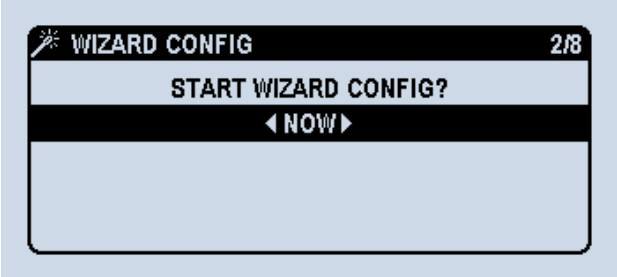
- English
- French
- Spanish



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

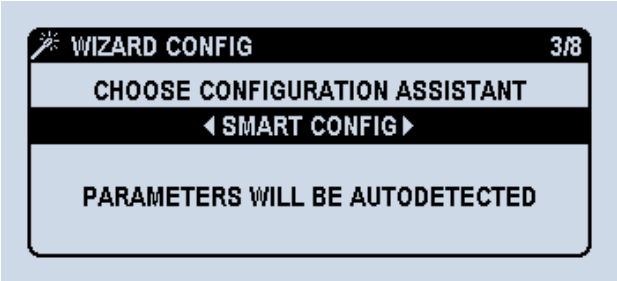
The wizard will remain accessible inside the menu PARAMETERS/WIZARD.



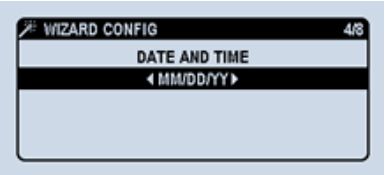
In case the decision taken is to begin with the wizard configuration, then the options are:

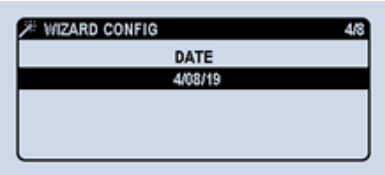
- To use the smart configuration: parameters like voltage, frequency and phase rotation will be auto detected and proposed to the user.
- To use the manual configuration: the user needs to enter the values manually.

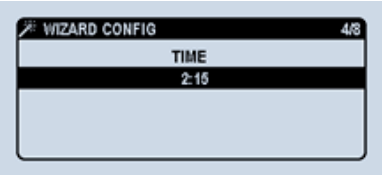
The controller will require the configurator 4-digit password before the configuration (**by default set to 1000**).



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

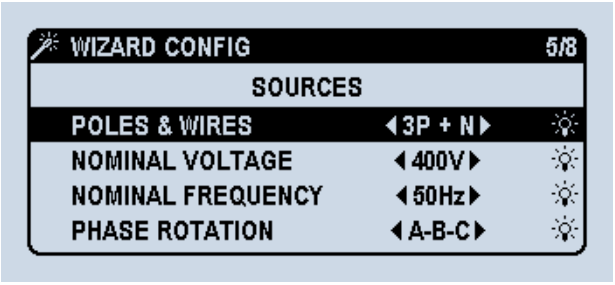






These time/date values will be saved and from that moment the RTC battery will keep the clock running even if the supply to the controller is lost.

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.

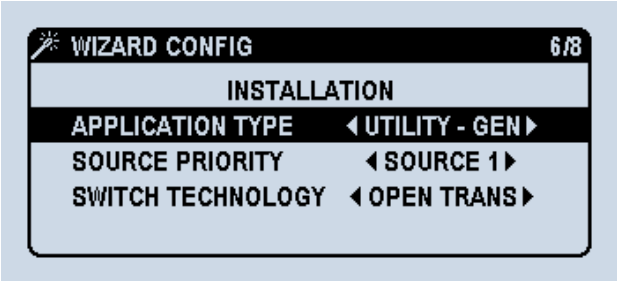
NOTE: It is possible to connect either the transformer or the genset to both source 1 or 2 during the wizard configuration by selection the priority source, or directly in "PARRAMETERS" > "NETWORK" > "APPLICATION".

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

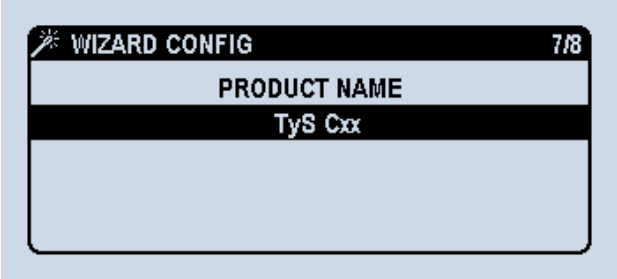
Switch technology stands for the type of switch used with the controller. The options are:

- 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).

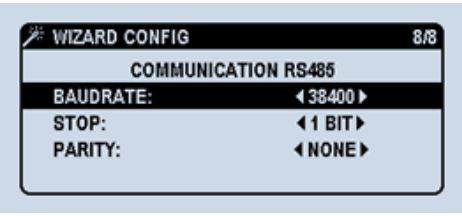
According to this configuration, the INPUTS and OUTPUTS of the controller to pilot the switch and receive the position feedback will be automatically configured to match the application requirements (see values by default in chapter 7.3 and I/O detail in chapter 12) but they can always be modified in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

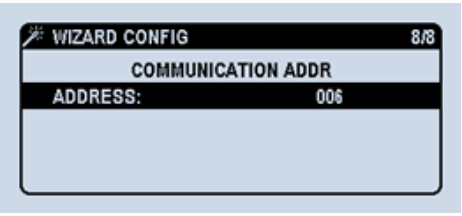


The 7th step is not affecting the functioning of the transfer switch but permits the user to select a name for the product. As default, it's ATyS C66, but it can be changed for any combination of letters, numbers and signs, for instance, "Cooling", "Line 1" or "DTC/21".

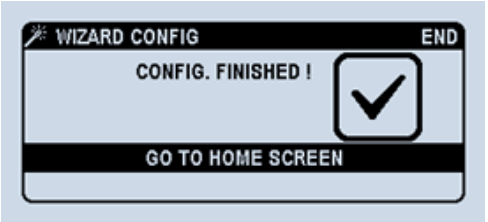


To finalize the configuration, the wizard asks for the communication parameters, such as the slave address (by default 6) and the communication parameters:





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).

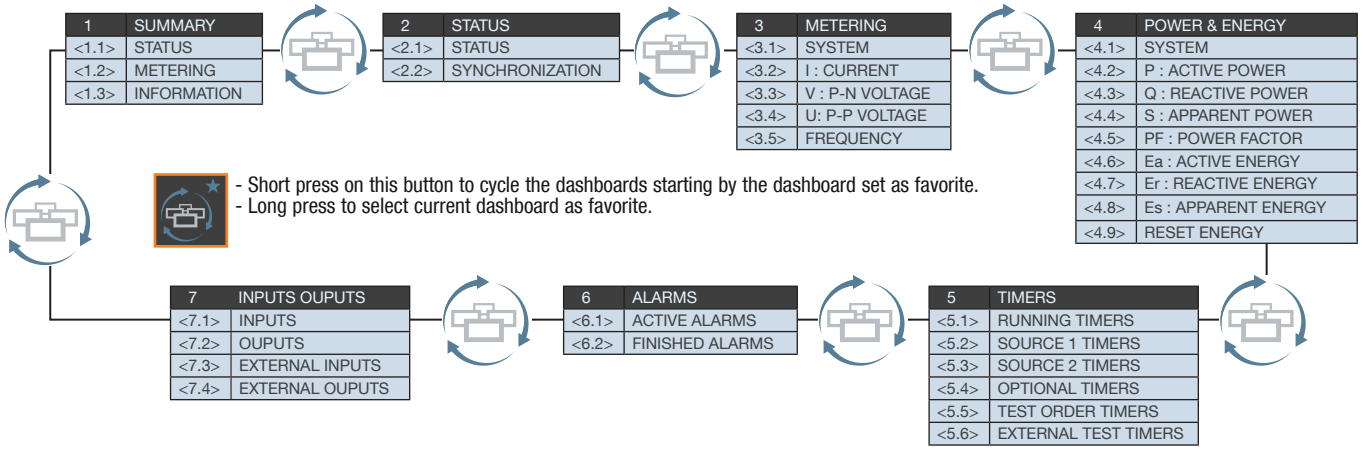


Note For a detailed configuration please consult chapter 11 (configuration).

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



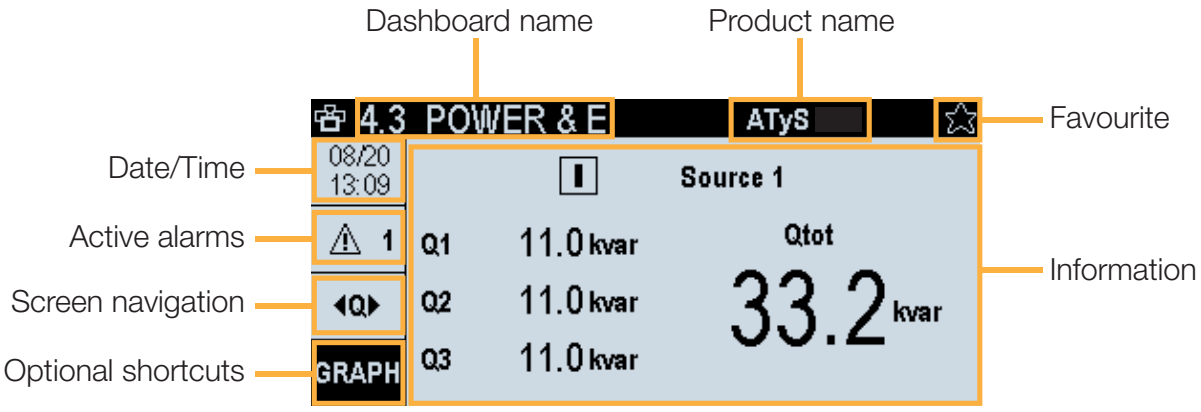
The dashboards can be visualized and screened through without the use of a password.

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.

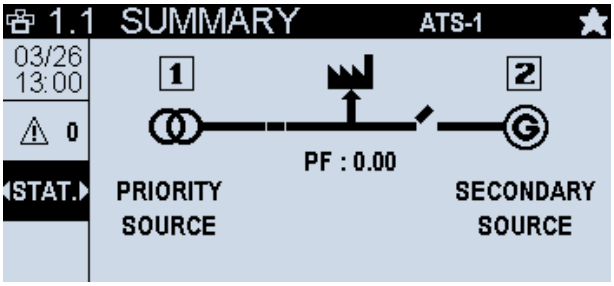
To display the favorite screen after navigation exit the menu by pressing the return key and then press the dashboard key.

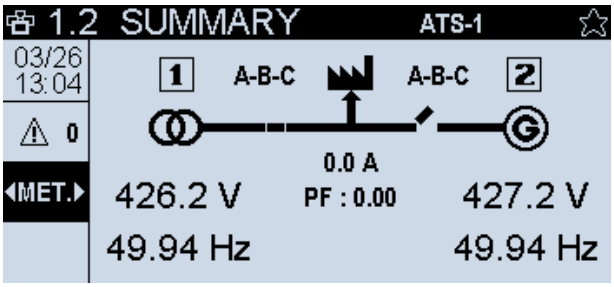
All the dashboards have the same display format logic as follows:



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.

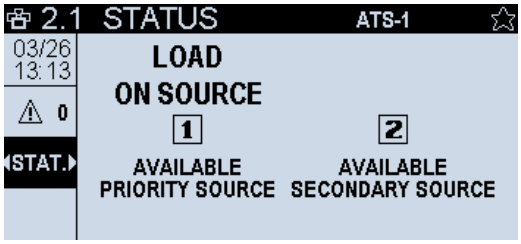


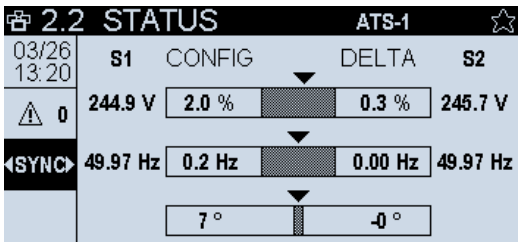


On the Summary display a mimic shows the status of the switch and the supply to the load. The sources will appear crossed if they are not available and not crossed if they are available. This information is also detailed in the status screen 2.1.

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

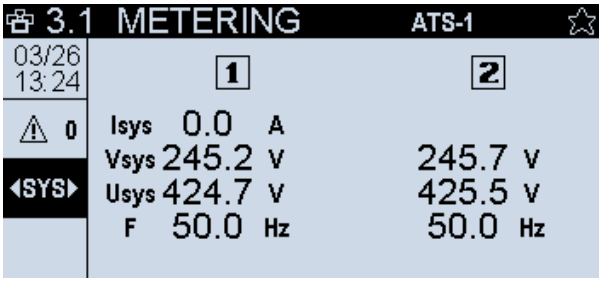
STAT: informs the user on the availability of each source.
SYNC: Information on the voltage, frequency and phase angle of both sources.





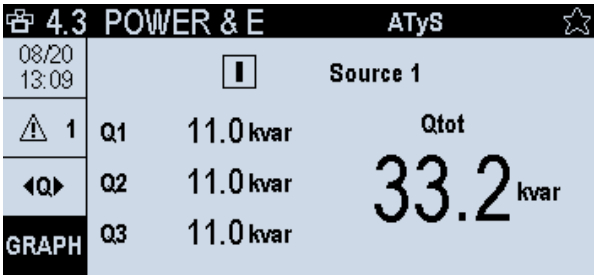
3 - METERING : Allows the user to visualize detailed metering information on the load side.

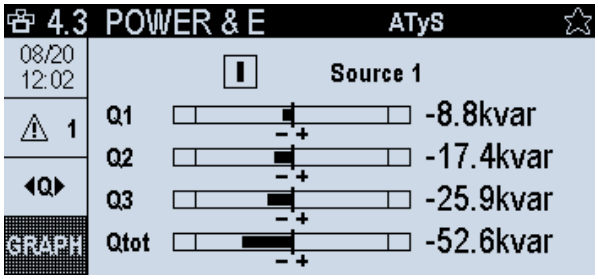
U: Phase-Phase voltage.
V: Phase-Neutral voltage.
F: Frequency.
SYS: Voltage, frequency and current of the system.
I: all currents measured (current transformers need to be connected to use this function).

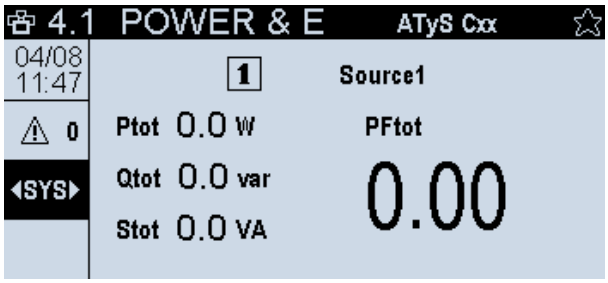


4 - POWER &E : Allows the user to visualize the power and energy used by the load. (Current transformers must be used to enable this function). The information can be shown in numerical or both numerical and bar graph.

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.

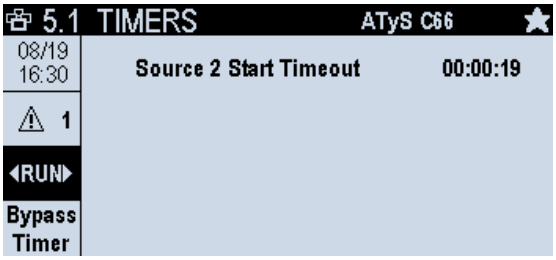






5 - TIMERS : Allows the user to visualize the status of the timers.

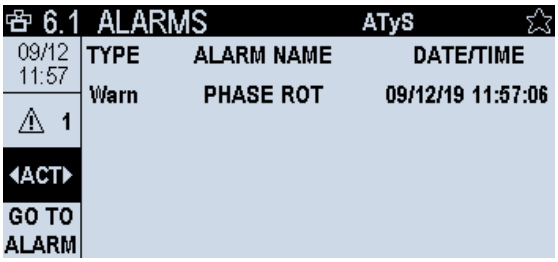
RUN: Shows all the ongoing timers, and allows the user to bypass the timers.
S1: Shows all timers linked to source 1
S2: Shows all timers linked to source 2.
OPT: Shows all optional timers



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).

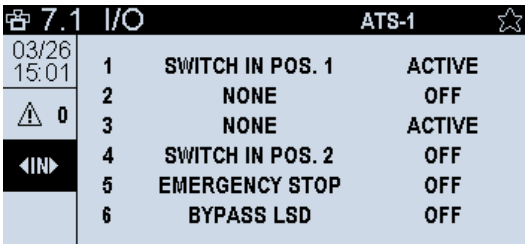
ACT: Shows all active alarms, and allows the user to direct access to the alarm menu.
FIN: Shows all finalized alarms that are not acknowledged by the user.

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.

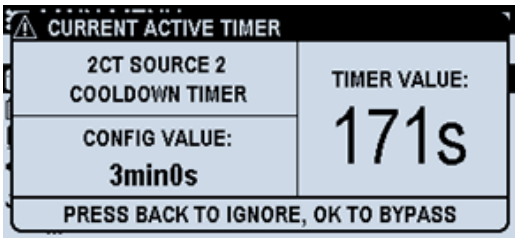
This is a dynamic pop-up that gives 2 options to the user:

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).

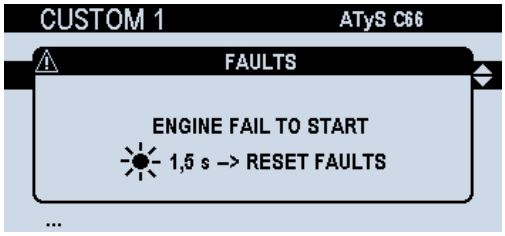
NOTE : Bypassing the timer will request a validation and an operator password.



- 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.

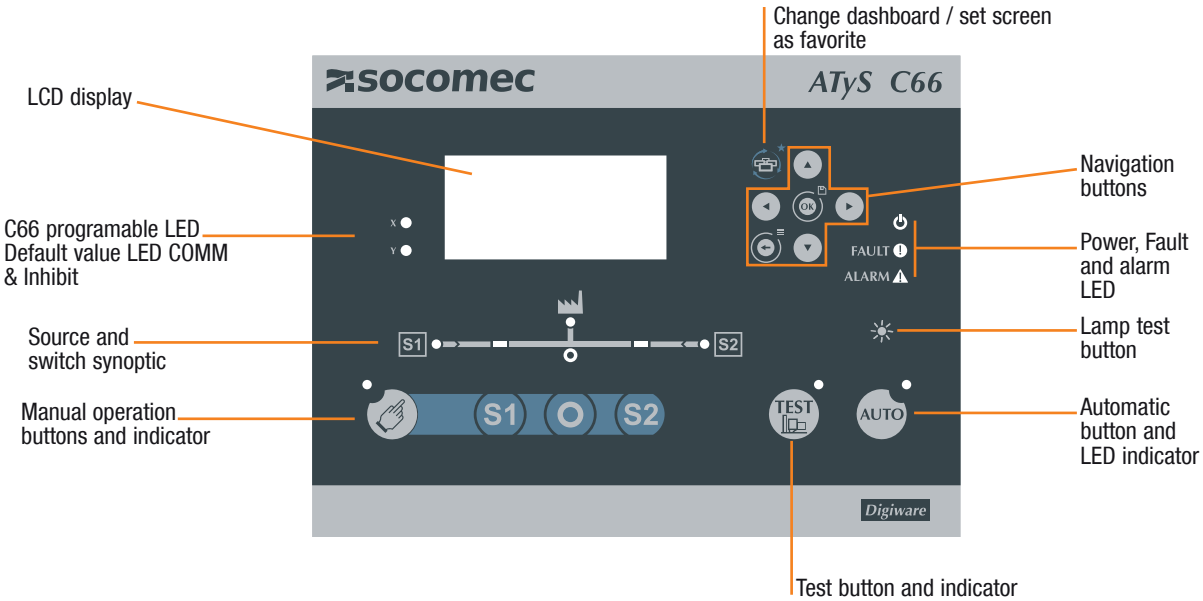


10. OPERATION AND CONTROL

10.1. HMI use

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

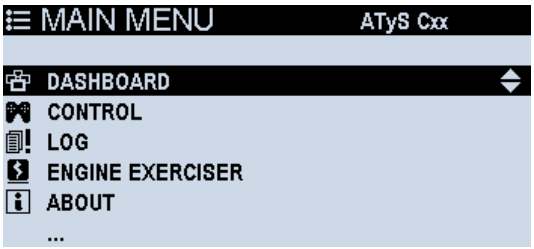
Overview of the HMI



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 piority 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/ Favourite	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 access 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)

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 O 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:

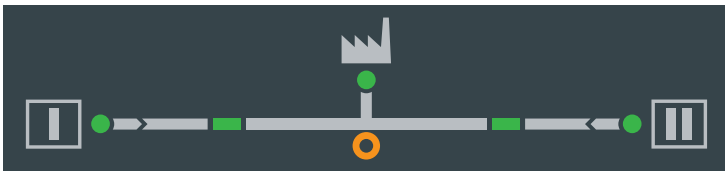
- Busbar dead
    - No voltage present on the source (all voltages below 50V).
- Source present
    - Voltage present (at least 1 phase above or equal to 50V) but availability conditions are not reached (see “Source available” below)
- Source available
    - To consider the source available:
        - 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 C55/65 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.

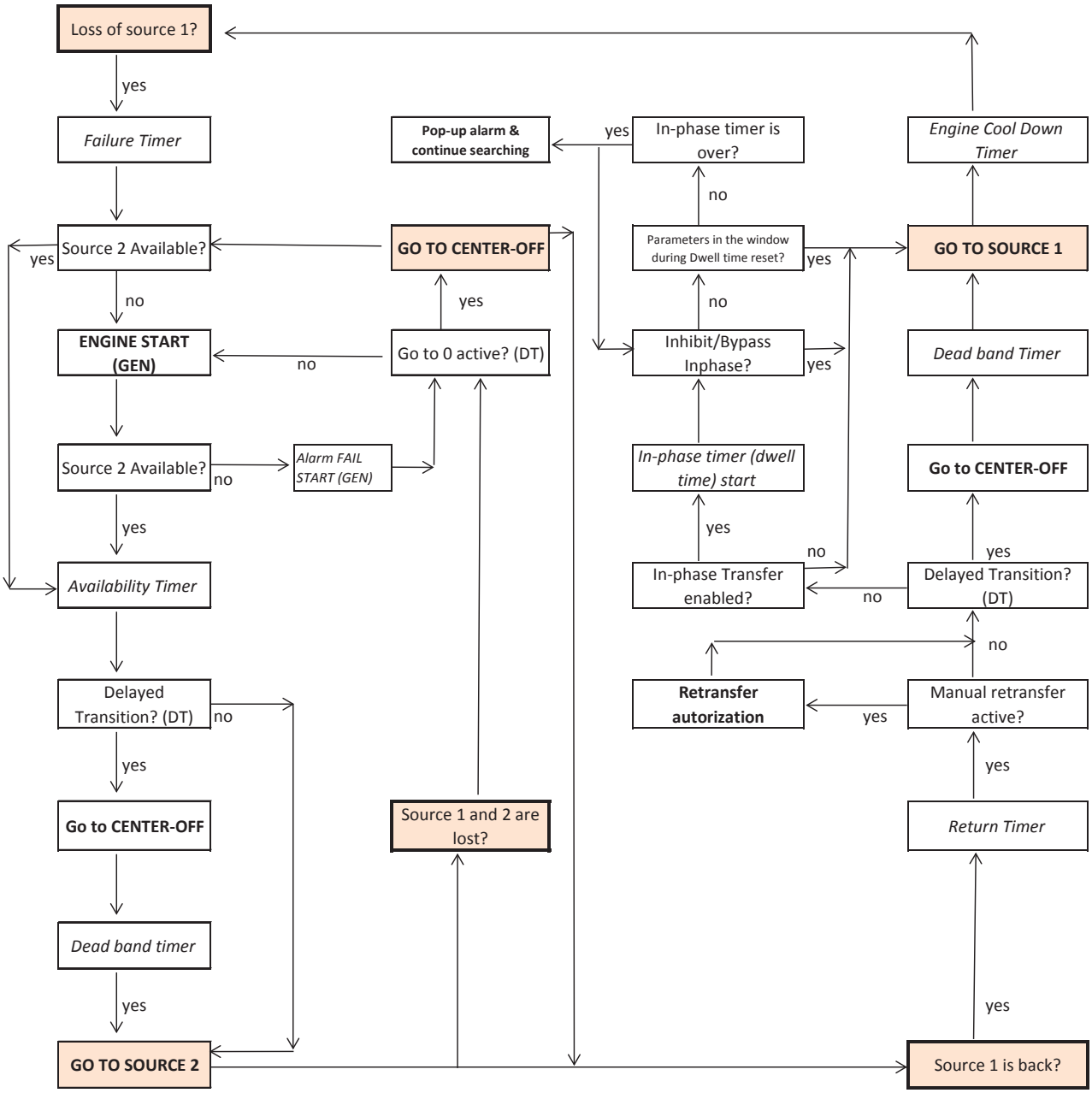
- If the LED is on, the load is supplied by either source 1 or source 2, which means that the source is available and the switch is in one of these positions.
- If the LED is blinking, the load is supplied but a load shedding is taking place.
- If the LED is off, the load is not supplied (switch not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

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

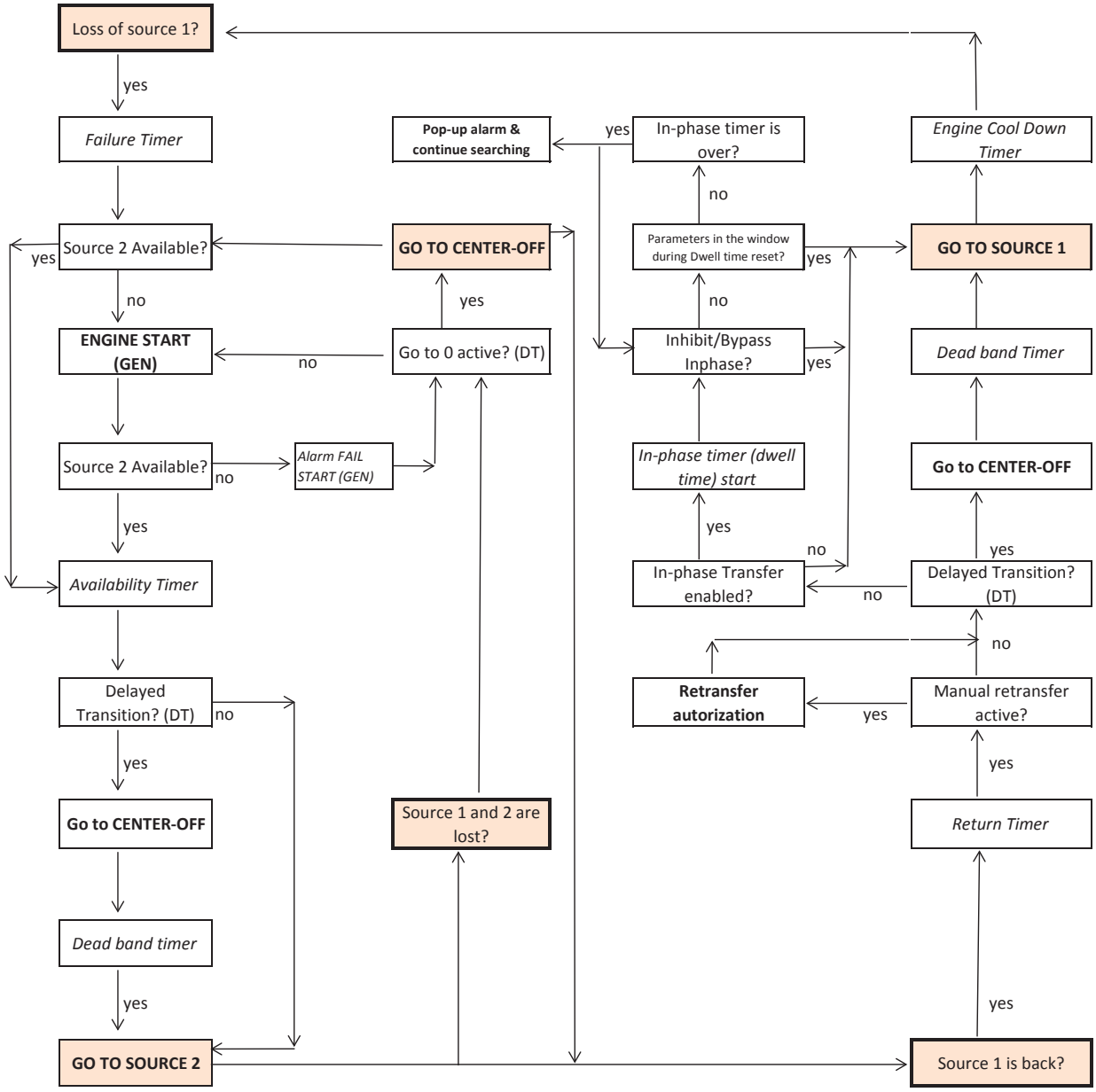
- If the LED is on, the switch is in center-off position (only if there is a 0 poistion)
- If the LED is off, the switch position is either on S1, S2 or unknown (should always be off for technologies without 0 position)
- If the LED is blinking, the controller considers the switch is in that position, 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 TEST ON LOAD (as standard) or TEST OFF LOAD and can be configured inside the PARAMETERS/DISPLAY/OPTIONS menu (TEST BUTTON USE).

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

A TEST OFF LOAD will initiate starting of the genset but will not give the order to transfer to the secondary source when it becomes available.

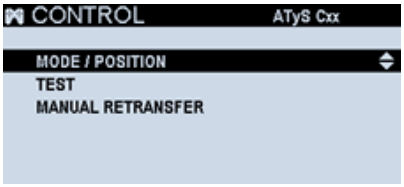
The duration of the tests can be limited (in the configuration) or can be set to Unlimited, when set to unlimited the user will have to press the test button again to stop the tests..

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

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

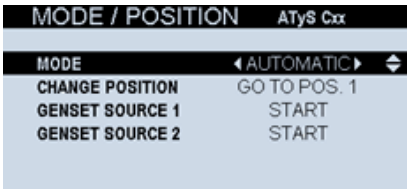
10.7. Control Menu

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.

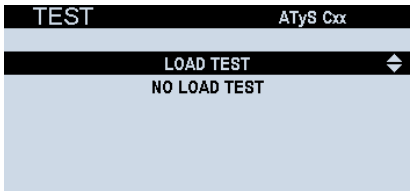
NOTE: For a total inhibition of the controller including the HMI, the external inhibit inputs must be used.



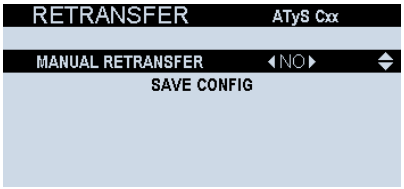
- CHANGE POSITION: (only in CTRL mode) permits sending orders to go to position 1, 0 (center-off) or 2 to the switch device.
- GENSET SOURCE 1/2: permits START or STOP the gensets installed as source 1 or 2.

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 NOLOAD 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 restransfer 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

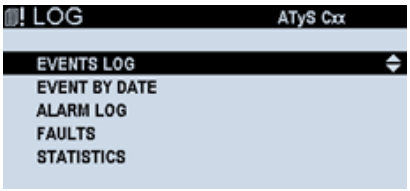
The LOG menu contains history; register and logs of:

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).

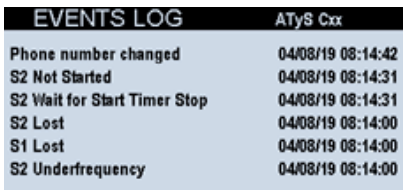


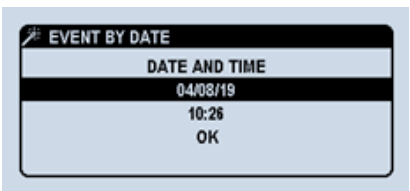
- EVENTS LOG: The controller C66 can store up to 3000 events using FIFO to replace older events when the memory is full.

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

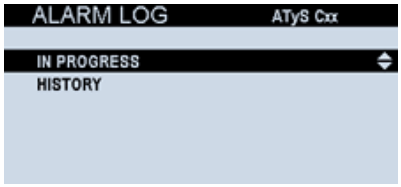
  To navigate through the event log, the UP and DOWN arrows can be used to advance on the event list one by one and the LEFT and RIGHT arrows to advance 6 events every time.

  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.





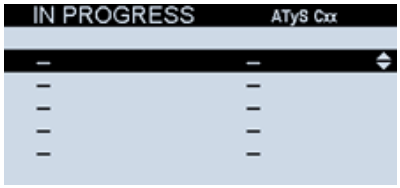
- ALARM LOG: This log can store up to 100 alarms or faults, even if they are in 2 different menus to make it simpler to the user. On the alarm log screen there are 2 options: in progress and history. “In progress” shows all active alarms and the history shows all the last alarms that have ended.

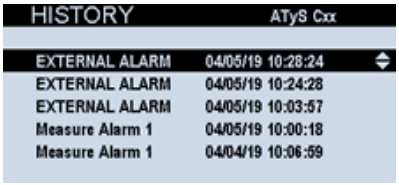


For each alarm, unlike with the events, the details are available, permitting the user to see:

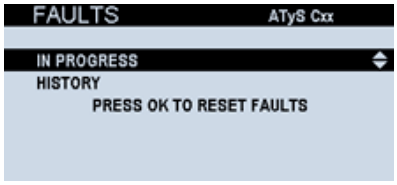
- Type of alarm
- Status
- Starting time and date
- Duration of the alarm active (counter running for active alarms)
- Criticallity of the alarm

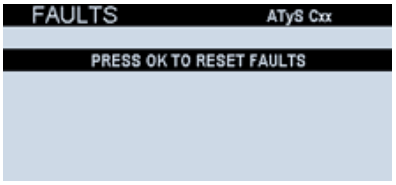
To learn about alarm configuration and options (see chapter 11.1.7).



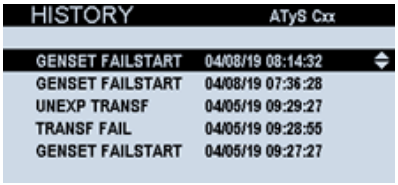


- FAULTS: 100 registers of faults and alarms can be stored inside the internal memory and they are divided into “in progress” and “history”. Faults also permit the reseting of faults using the option “ PRESS OK TO RESET FAULTS” and confirming this on the pop-up that appears on screen.



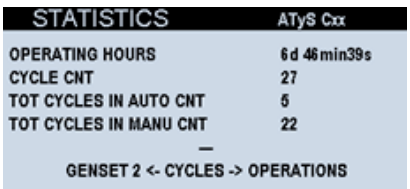


The information on the history log is the fault description and the time & date when it occurred.



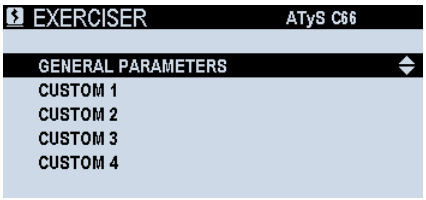
- STATISTICS: On this screen the user can see counters for:

- Cycles (operating hours, number of cycles, cycles in manu, cycles in auto)
- Operations (total and for each position)
- Running hours (total and partial) (partial can be reseted by user)
- Source 1 / Source 2 data (total time in source, partial time, last switch, total time on load)
- Genset 1 / Genset 2 data (total active time, total active time on load, genset start counter)



10.9. 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.

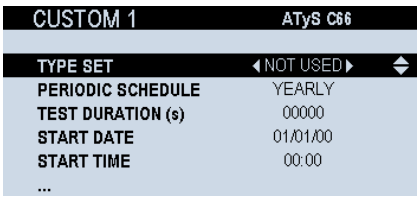
  - NO LOAD TEST: will perform a genset start for the defined time, and a genset stop after the configured time elapses.
  - NOT USED: will not perform anything

- **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)



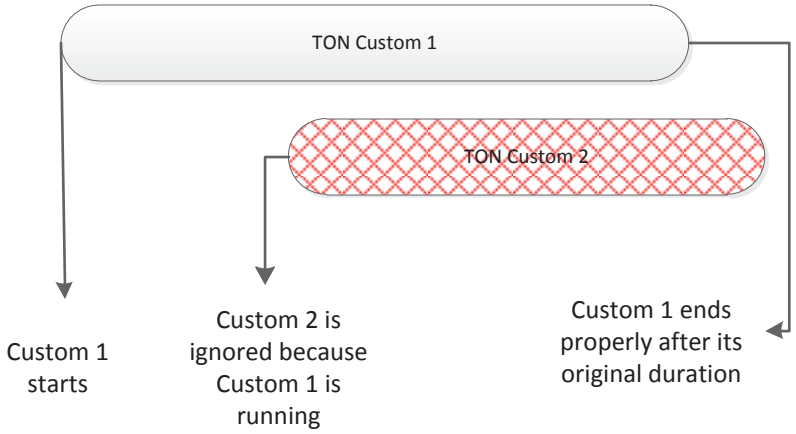
*Example:

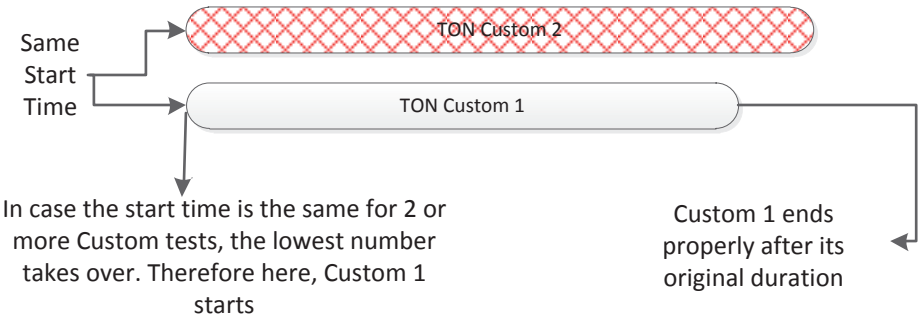
- Type: ON LOAD
- Periodicity: Monthly
- Test duration: 15min

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.

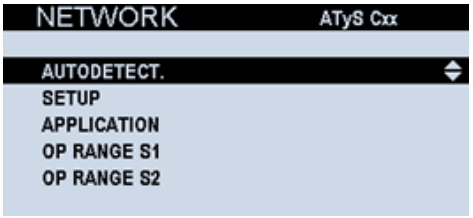
ALARMS – Permits programming different alarm types that can be linked to outputs and will show the information on the screen of the ATyS C66 as well as the webserver. (The webserver is available with M70 or D70 gateways available as an accessory). See chapter 11.1.7.

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)

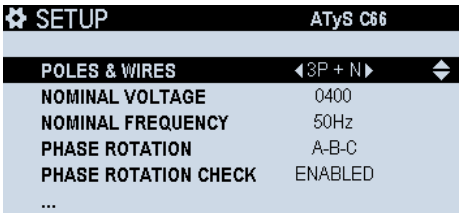
11.1.1. NETWORK parameters menu

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.

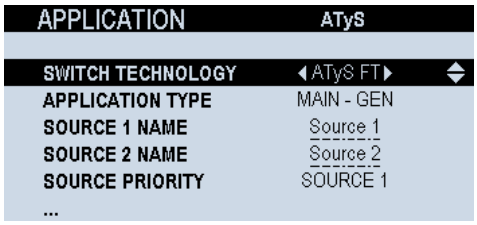
SETUP – Settings concerning the installation can be configured here:



- 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”.

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 TYPE – 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.

Note For safety reasons the change of technology has to be done on Manual mode and requires the configurator profile password.

- APPLICATION TYPE
  - UTILITY/UTILITY when using 2 transformers as source 1 and source 2.
  - UTILITY/GENSET when using a transformer and a genset as power sources.
  - GENSET/GENSET when using 2 gensets as power sources

- SOURCE NAME: user can enter a name for each source. By default "Source 1" and "Source 2"

- SOURCE PRIORITY: priority/preferred source can be set for source 1, source 2 or "no priority". In the "no priority" case, the switch will remain closed on any source as long as it is available.

- LOGIC: according to the inputs of the switch to receive position orders, there are 2 types of logic:
  - IMPULSE: the output from the controller will send a pulsed signal with a defined duration to the switch to change position.
  - CONTACT: the output from the controller will close and stay closed indefinitely (maintained) as long as the transfer switch is required to stay in that position. This logic is used mainly with contactors but also with breakers and switches that require a maintained input.

- LOAD TEST PRIO (yes/no): with this option, when a TEST is ongoing, it will stay in test mode until it ends (timers elapse) even if the source is lost during the test.

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

- RETRY NUMBER (0-10): If the position is not reached after a position order, the controller can perform several retries.

- RETRY DELAY (0-10000ms): delay between retries.

- PULSE LENGTH (ms): length of the pulse output signal (only required for PULSE mode).

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
...	

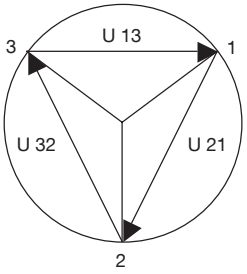
OV= overvoltage

UV= undervoltage

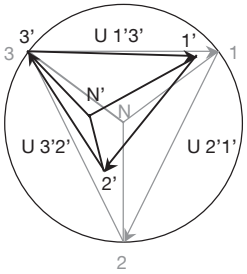
OF = overfrequency

UF = underfrequency

UB = unbalance



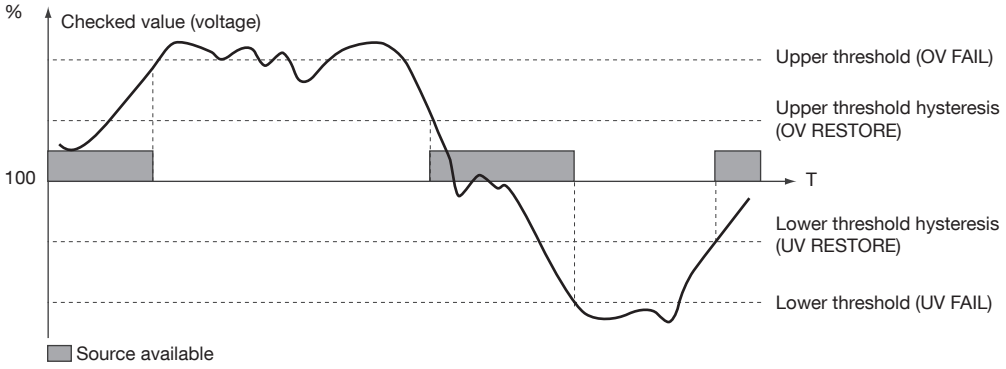
Balanced network



Unbalanced network

For each parameter, the limits can be set in % vs the nominal value and there are two parameters to set: the tripping value that will make the source be considered unavailable (FAIL) and the value 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".

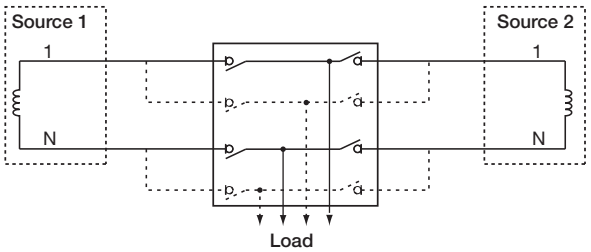
		DEFINITION	** ADJUSTMENT RANGE
OV FAIL	115%	Overvoltage threshold: Source Supply 1	102 – 130%
OV RESTORE	110%	Over-voltage hysteresis: Supply 1	101 – 129%
UV FAIL	085%	Undervoltage threshold: Supply 1	60 – 98%
UV RESTORE	095%	Undervoltage hysteresis: Supply 1	61 – 99%
UB FAIL	000%	Phase unbalance threshold: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

** Adjustment range given:

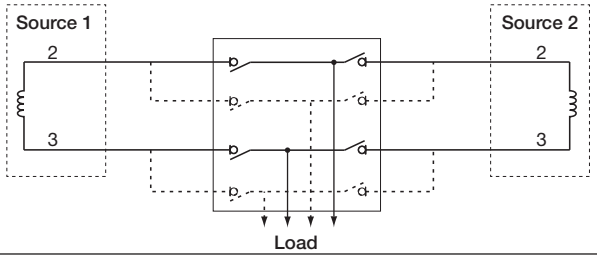
- As a % of U nominal for Over and Undervoltage
- As a % of U avg in case of unbalances.
- As a % of nominal frequency

Types of Network

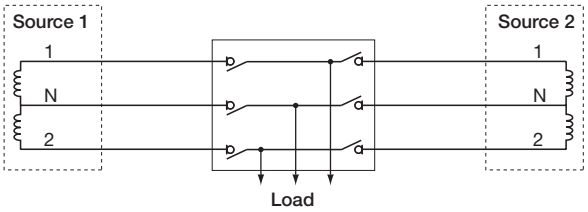
1P+N Single phase network



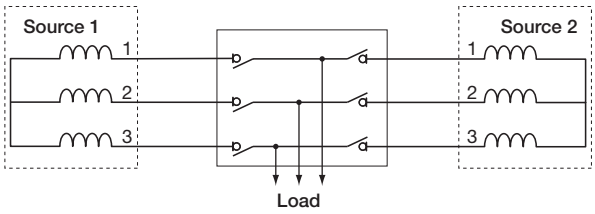
2P Two phase network without neutral



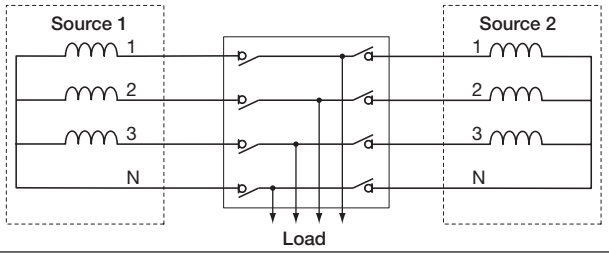
2P+N Two phase network with neutral



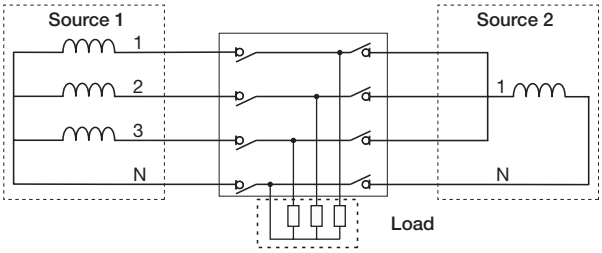
3P Three phase network without neutral



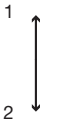
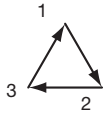
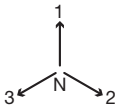
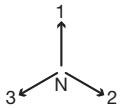
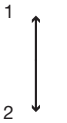
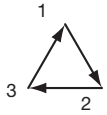
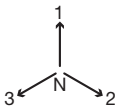
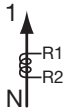
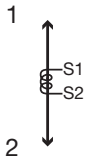
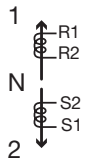
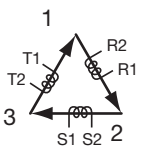
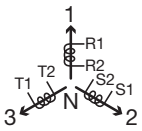
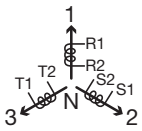
3P+N Three phase network with neutral



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



Metering and sensing details

NETWORK TYPE						
	1P	**2 P**	**2P+N**	**3P+N**	**3P+N**	**3P+N / 1P+N**
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
Source 2						1 phase 2 wire
Source 1						
Source 2						
CT cabling (load side)						
VOLTAGE SENSING						
Source 1	- V1	12	U12 V1, V2	U12, U23, U31	U12, U23, U31 V1, V2, V3	U12, U23, U31 V1, V2, V3
Source 2	- V1	12 -	U12 V1, V2	U12, U23, U31 -	U12, U23, U31 V1, V2, V3	- V1
Source presence (source available)	✔	✔	✔	✔	✔	✔
Source in ranges (U, V, F)	✔	✔	✔	✔	✔	✔
Rotation phase order	-	-	-	✔	✔	S1 only
Neutral position	-	-	✔	-	✔	S1 only
Voltage unbalanced is lower than threshold	-	-	-	✔	✔	S1 only
METERING						
Source 1	- V1 f1	U23 - f1	U12 V1, V2 f1	U12, U23, U31 - f1	U12, U23, U31 V1, V2, V3 f1	U12, U23, U31 V1, V2, V3 f1
Source 2	- V1 f2	U23 - f2	U12 V1, V2 f2	U12, U23, U31 - f2	U12, U23, U31 V1, V2, V3 f2	- V1 f2
If CT connected (load side)	- - - P_T, Q_T, S_T, PF_T	- - - P_T, Q_T, S_T, PF_T	P1, Q1, S1, PF1 P2, Q2, S2, PF2 - P_T, Q_T, S_T, PF_T I1, I2	P1, Q1, S1, PF1 P2, Q2, S2, PF2 P3, Q3, S3, PF3 P_T, Q_T, S_T, PF_T I1, I2, I3, In	P1, Q1, S1, PF1 P2, Q2, S2, PF2 P3, Q3, S3, PF3 P_T, Q_T, S_T, PF_T I1, I2, I3, In	P1, Q1, S1, PF1* P2, Q2, S2, PF2 P3, Q3, S3, PF3 P_T, Q_T, S_T, PF_T I1, I2, I3, In

11.1.2. LOAD parameters menu

The ability to measure and show the values on screen can be enabled or disabled on the first parameter “LOAD STATUS”.

The values to configure are:

- LOAD TYPE: selection of the number of wires and current transformers used to measure. Options are:
- The number of Current Transformers (CT) that can be used to measure the current on the load side depends on the Network configuration:

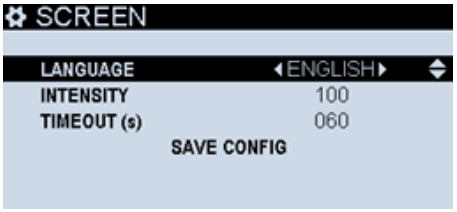
NETWORK TYPE	LOAD TYPE	POSITION OF CT'S	NOTES
1P+N	1P+N_1 CT	On L1	Standard solution. Calculated neutral.
2P	2P_1 CT	On L1	Standard solution.
2P+N	2P+N_2 CT	On L1 and L2	Standard solution. Calculated neutral.
3P	3P_3 CT	On L1, L2 and L3	Standard solution.
	3P_2 CT	On L1 and L2	Accuracy reduced by 0,5%. 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.
- LINE I1,I2,I3,I4 WAY: 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:

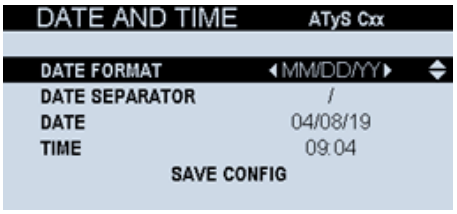


Languages available:

- English
- French
- Spanish

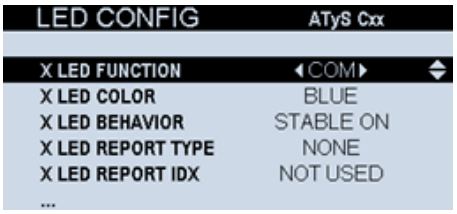
“Timeout” sets the time in seconds where the screen will remain on after touching a button.

- DATE AND TIME PARAMETERS:



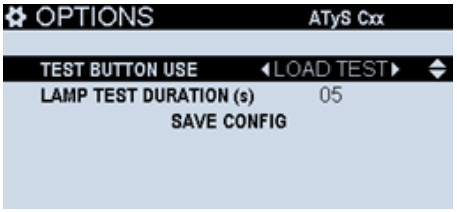
Date and time will remain running thanks to the RTC battery even if all sources are off.

- CUSTOMIZABLE LED (X & Y) PARAMETERS:



- The X and Y LEDs on the front face can be used for several purposes. For each one of them there are different parameters that can be set:
- FUNCTION: There are several functions that can be chosen:
  - Always ON: LED permanently on.
  - Button response: everytime 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)
  - Lift/Elevator active: Elevator/lift output signal is active.
  - Transf. Ongoing: Transfer is taking place (it counts from detection/request of transfer to transfer finalized, position reached)
  - None: no use of the LED
- COLOR: Blue or Yellow can be chosen.
- BEHAVIOUR: Stable on (fixed) or Blink can be chosen.
- REPORT TYPE: (only for FUNCTIONS Input Report or Output Report) will allow choosing between internal I/O or external I/O modules (if any).
- REPORT IDX: Choose the number of output that it is going to be used.

- OPTIONS for the HMI buttons



- TEST button use (between ON LOAD or OFF LOAD test)
- LAMP TEST duration (s): This will alow the user to change the duration of the lamp test buton 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.

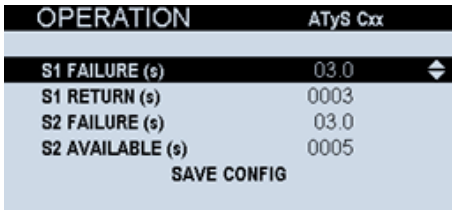
- CHANGE PRODUCT NAME: allows changing the name of the ATS. This information will appear on all the dashboards and menus on the top-right of the screen.

11.1.4. TIMERS parameters menu

All the operational timers can be set on this menu. They are up to 26 general timers splitted 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.

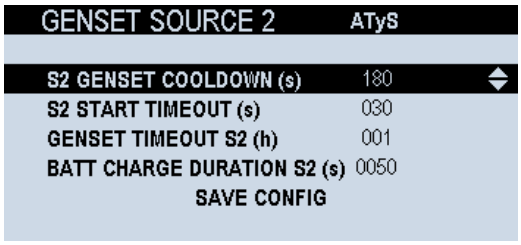
- Operation timers (6 timers)



- FAILURE TIMER (s): time after source is lost, to make sure it's really lost and start a transfer.
- RETURN TIMER (s): time after a transformer/main source that was off comes back, to make sure it really came back.
- AVAILABLE TIMER (s): time for a genset/diesel generator source to be on and inside the right defined values to be considered available and ready to accept a transfer.
- S1 DEAD BAND (s): time to wait without load supply (including source failure time and time in center-off / zero position) when transfering from S1 to S2.
- S2 DEAD BAND (s): time to wait without load supply (including source failure time and time in center-off / zero position) when transfering from S2 to S1.

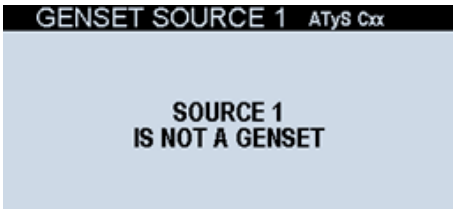
Note By default, S1 and S2 DEAD BAND are the same and set to 3s. On C55 there is no differentiation between S1 or S2. For ATyS FT technology (I-II switch, with no 0 position), DBT timer does not exist.

- Genset source 1 and source 2 are available if the source is related to a genset (in M/G depending on prio, and in G/G).



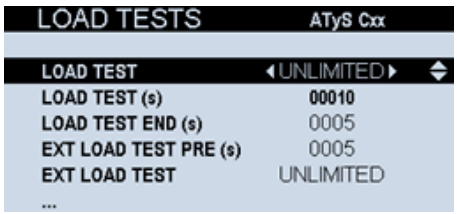
- GENSET COOLDOWN (s): once transferred back and genset is running without load, time to wait until the signal to turn off the genset is sent. This permits the genset to cool down after utilisation
- START TIMEOUT (s): time to wait for the genset to start. After this time, a fault will pop-up saying "Fail to start genset"
- GENSET TIMEOUT (h): time for the genset to be off, in hours, for the battery charger output to become active (if used in the I/O menu)
- BATT CHARGE DURATION (s): time for the battery charger output to stay active once it's been activated after the genset timeout.

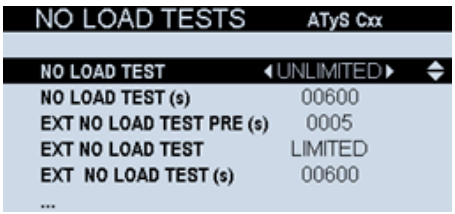
NOTE: If the source is not linked to a genset the following message will be shown.



- Tests on load (5 timers) and off load (4 timers)

- 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).



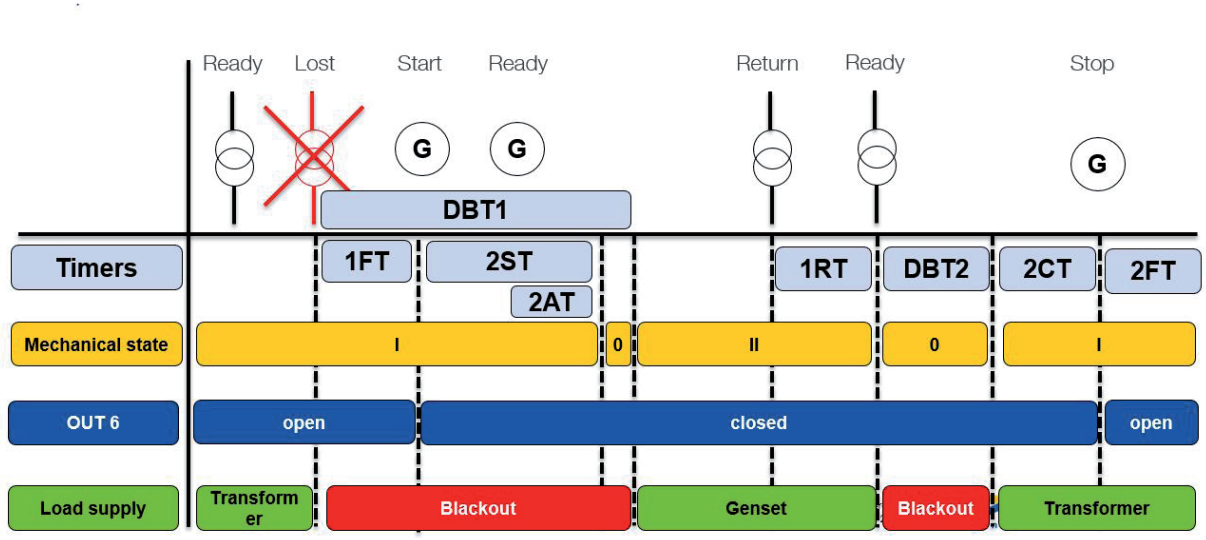


- TEST(s): duration of the test
- TEST ON LOAD END (s): after a test on load (not external), time to wait in secondary source before going back to prioritary source
- EXT. TEST ON/OFF LOAD PRE (s): pre-timer before starting transfer to secondary source on an external test.
- EXT. TEST ON/OFF LOAD POST (s): post-timer after finishing the test and going back to prioritary source on an external test.

Example of a full sequence with all the main operation timers:

- Utility-Genset, priority on Utility (Transformer)

- No manual retransfer. Elevator signal active (specific function)



LEGEND:

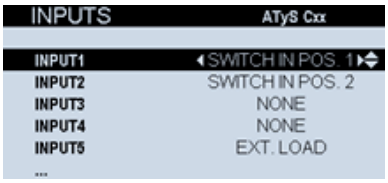
- 1FT = Failure timer S1
- 2ST= Genset start timeout timer
- 2AT= Availability timer S2
- DBT1= Dead band timer S1
- 1RT= Source 1 return timer
- ELD = Elevator delay & ELR = Elevator restore
- DBT2= Dead band timer S2
- 2CT= Cooldown timer genset S2
- 2FT= Source 2 failure/disconnection timer

To see the different timer configuration in detail, consult the TIMERS annex in this instruction manual.

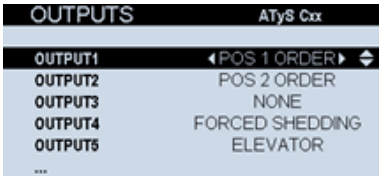
11.1.5. I/O parameters menu

All the I/O can be configured in this menu. By default, the controller has 6 inputs and 6 outputs on the controller (called internal Inputs / Outputs). An additional 6 modules with 4in/2out on each can be added achieving up to 30 inputs and 18 outputs total. The I/O menu has the following submenus:

- INPUTS: permits configuring the 6 internal inputs

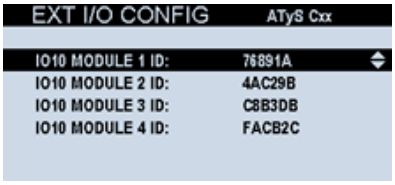


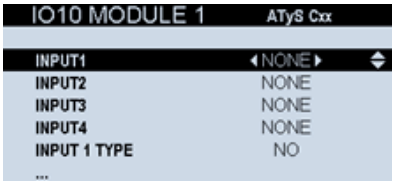
- OUTPUTS: permits configuring the 6 internal outputs



- EXTERNAL I/O DETECTION: permits detecting and autoconfiguring the external I/O modules.

- EXTERNAL I/O CONFIG: permits configuring each one of the external modules. The way to identify the modules is thanks to the module ID, written on the module and unique for each one of them. The configuration procedure is the same than with the internal I/Os





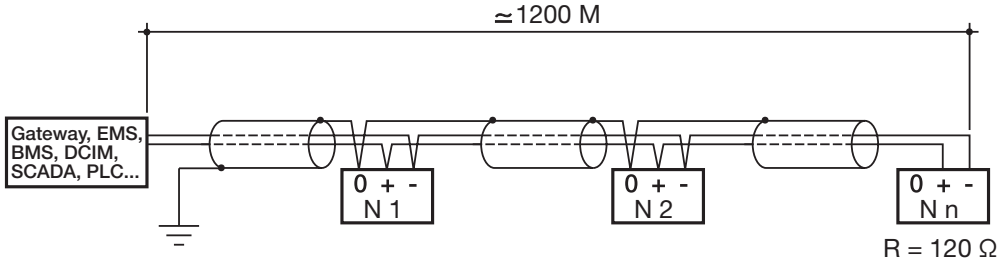
NOTE: The specific functions that are related to the I/O might require some settings to be configured on the SPECIFIC FUNCTIONS menu. Consult the I/O Annexes in chapters 13.3 and 13.4 to have the full list of functions to be configured on the I/O.

11.1.6. COMMUNICATION parameters menu

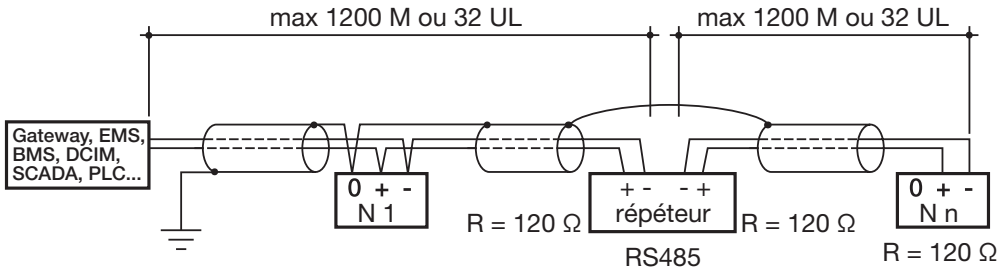
RS485

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.

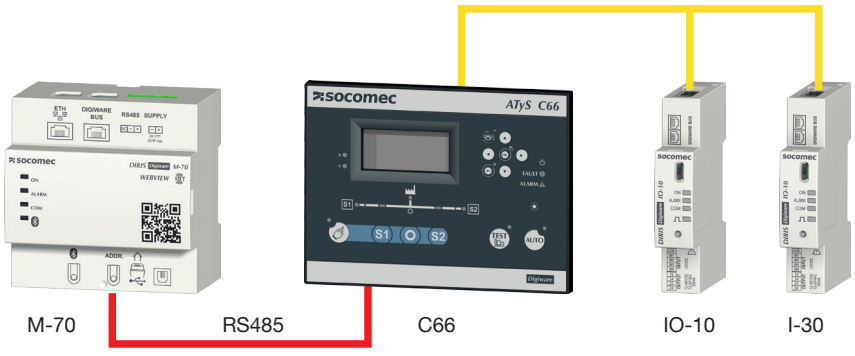
Using the controller as a slave. Part of a Digiware chain and replacing the U10 digiware module that sends the voltage sensing information into the chain. (Utilized by other digiware measurement modules to provide voltage).

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:



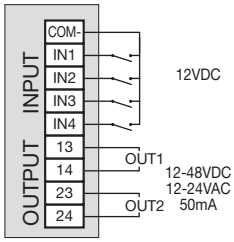
When the D70 or M70 Socomec gateways are used, the ATyS C66 can be connected by RS485 or with the Digibus.

Using Diris D70 gateway.

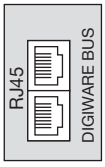
Note When the controller is part of a Digiware chain, it's not possible to use the external I/O modules in direct connection with the controller.

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:

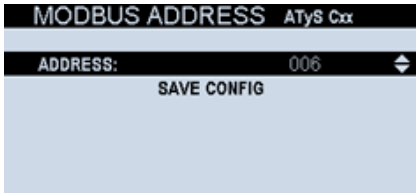
Once the controller is powered up, the modules will receive power supply and by changing the settings:

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.

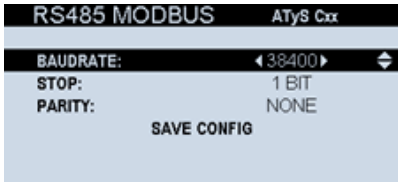
Communications Menu:

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.

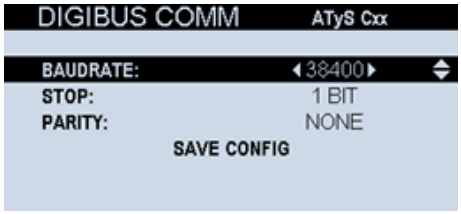


- RS485 MODBUS: All Modbus parameters can be set here:

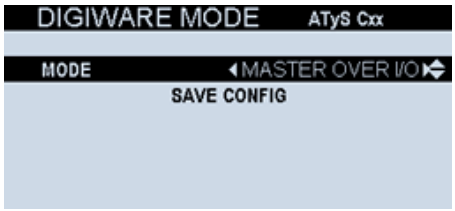


- BAUDRATE (1200-2400-4800-9600-19200-38400-57600-115200) By default 38400.
- STOP: (1BIT – 2BITS) By default 1 BIT
- PARITY: (ODD-EVEN-NONE) By default none

- 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.

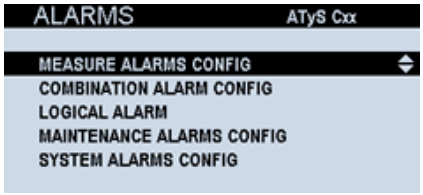


- DIGIWARE MODE: to be able to use the controller inside a Digiware chain, it's needed to change the parameter MODE to SLAVE. To be able to use external I/O modules the function of the RJ45 has to be switched to "MASTER OVER I/O" changing the MODE parameter:



11.1.7. ALARMS parameters menu

ALARMS are different to FAULTS on the ATS Controller. Alarms are user configurable while faults are internal to the product and cannot be disabled. Everything that is critical for the application is set as Fault (Refer to chapter 12, under maintenance, to know more about Faults).



All alarms are by default DISABLED and should be enabled if the user wants to use them. For each alarm, one can set a threshold, an acknowledgement method, an output type, an output report and a criticality level.

Thresholds: this is the value that will trigger the alarm. For the inspection time, for example, it will be the time since the last inspection (set on Inspection Mode) and for the other types it will be the number of operations/cycles or a time value in seconds.

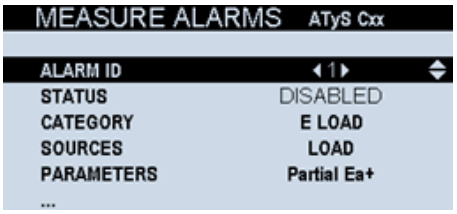
Acknowledgment method: Acknowledging an alarm will reset the alarm LED and remove the alarm from the active alarm list until it is activated again. An alarm should be acknowledged when the user has understood and taken action according to the alarm that was triggered. Changing the acknowledgment method will allow the user to acknowledge either through: HMI, communication, or using the rear inputs.

Output type: the alarms can be associated to an output that will become active while the alarm is active. The output used can be chosen between the internal and the external outputs (extension modules).

Criticity: a level can be chosen for each alarm between INFORMATION, WARNING and CRITICAL, where this last one 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.

NOTE: If using the "AUD – Audible alarm" output, it will only be active with alarms set as CRITICAL.

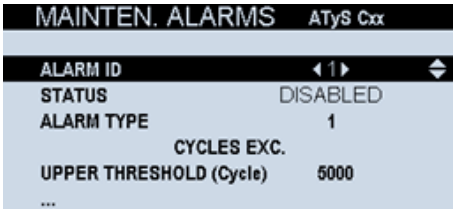
MEASURE ALARMS CONFIG – Permits configuring up to 4 alarms related to metering parameters.



- CATEGORY: which value will trigger the alarm.
  - Energy (consumption) form a source
  - Energy (consumption) from the load side (total)
  - V/U/F from a source
  - V/U/F from the load
  - P/Q/S/PF
  - I (current)

- PARAMETERS: inside each one of the categories there can be different options like:
  - Energy (E LOAD or E SOURCES) Partial Ea+ (consumed active energy using partial counter), Partial Ea- (same but generated), Partial Es, Partial Er+, Partial Er-.
  - V/U/F LOAD: Vsys (system avg phase to neutral voltage), F (frequency value), Uph OR (composed voltage phase-phase, counting any of the values), Uph AND (same but counting all 3 U values above limits U12 U23 and U31), U sys (composed voltage avg), Vph OR (same for phase to neutral voltages, counting any of the values V1 V2 V3), Vph AND (same but counting all of them), Vn (neutral voltage).
  - V/U/F SOURCES: Vsys, Vunb (vectorial unbalance, based on phase and amplitude), F, Uph OR, Uph AND, Unba (absolute phase-phase unbalance, absolute amplitude value (no phase)), Usys, Uunb (vectorial unbalance on phase-phase voltages, based on phase and amplitude), Vph OR, Vph AND, Vn, Vnba (absolute unbalance, absolute amplitude value (no phase)).
  - P/Q/S/PF: P OR (any of active power values), P AND (all active power values), Ptot (total active power), Q OR (any of reactive power values), Q AND (all reactive power values), Qtot (total reactive power), S OR (S1 or S2 or S3 out of limits), S AND (S1 and S2 and S3 out of limits), Stot (total apparent power), PF OR (any of power factor values), PF AND (all of power factor values), PFtot (total power factor), PF TYPE OR (PF1 or PF2 or PF3 leading/lagging (non desired value is settable)), PF TYPE AND (PF1 and PF2 and PF3 leading/lagging (non desired value is settable)), PF TYPE TOT(PF tot average (not the desired type, leading or lagging)).
  - I (current): Isys (system current), Iunb (current unbalanced, taking into account vector and absolute value), In (neutral current), Iph OR (any phase current), Iph AND (all phase currents), Inba (absolute, non-vector current value).

MAINTENANCE ALARMS CONFIG – Allows the service engineer (maintenance password required) to set up to 6 alarms of different types or of the same type.

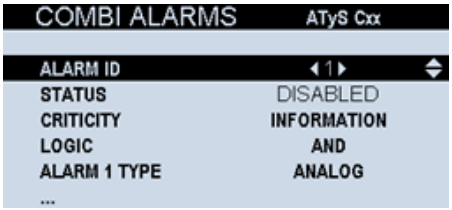


- Cycles Exceeded: maximum number of operation cycles of the switch reached. A cycle is considered going from one source to the other source and back (for example “S1 – S2 – S1” or “S1-off-S2-off-S1”). By default this value is set to 5000 operating cycles.
- Operations Exceeded: maximum number of operations (Any change of position of the transfer switch. By default this is set to 10000.
- Genset runtime S1 or S2: total amount of time that the genset has been running (supplying the load or not). Generally used for genset maintenance purposes. By default it is set to 900000s (250h).
- Total time of genset supplying load on S1 or S2: total amount of time that the genset has been supplying the load. Generally used for genset maintenance purposes. By default this is set to 900000s (250h).
- Inspection time: counts the time from the last inspection (entered in “Inspection Mode” of the maintenance menu). Can be used for periodic inspection/service purposes on the transfer switch. By default inspection time is not activated. Socomec recommend to activate inspection time during the first commissioning with values based on the transfer switch manufacturer recommendations and the application requirements.

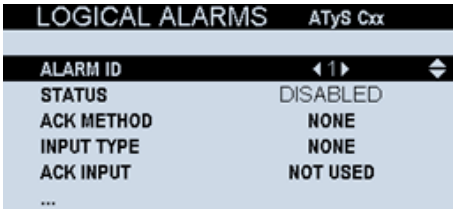
Note that there are also other parameters related to service (protected with Maintenance password) inside the MAINTENANCE menu. See chapter 11.1.10.

COMBINATION ALARMS CONFIG – (This permits up to 4 Boolean logic combination alarms (using OR / AND) on the defined alarms (logical, measurement, maintenance).

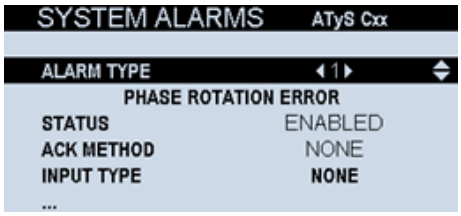
This can be done by using the INDEX of each one of the 2 alarms to combine.



LOGICAL ALARMS CONFIG – Permits up to 4 alarms using the internal or external inputs.



SYSTEM ALARMS CONFIG – There are 7 system alarms that can be used to detect minor failures on the installation.



- Phase rotation error: If a change on phase rotation occurs, alarm will be activated.
- External alarm: If an input is configured as External Alarm, this alarm will be activated when the input will be active.
- I/O connection failed: If a configured external I/O module suddenly is not detected, this alarm will be active in order to alert the user that a cable might accidentally been disconnected.
- Controller unavailable: If the controller cannot perform the transfer function this alarm will be activated (major fault or product inhibited).
- Load not supplied: If load is not supplied by any cause, this alarm can be activated when enabled.
- RTC Low battery: If the RTC battery has low battery and needs to be changed, this alarm will be active.
- DC AUX supply out of limits: If the DC auxiliary supply is out of limits (less than 10 VDC) this alarm will become active.

11.1.8. PASSWORDS

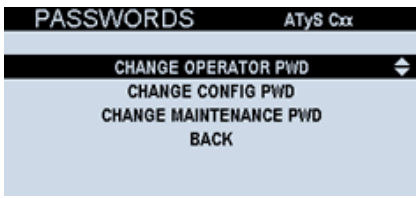
The controller provides 4 levels of security intended for 4 different types of users:

- 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.**

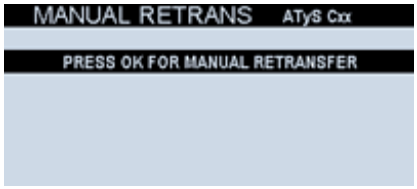
11.1.9. SPECIFIC FUNCTIONS Menu

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

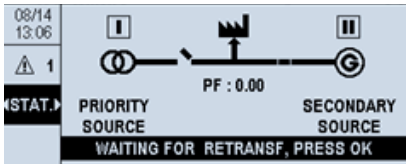
Manual retransfer

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.



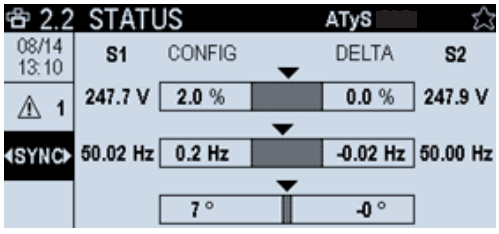
In-phase transfer

The in-phase transfer is available for ATyS FT typology of transfer switch or equivalent (2 position with a fast transfer typically <100ms). When activated and configured it allows the in-phase monitoring of the 2 sources by checking the Voltage, Frequency and Phase Angle continuously to make sure that the sources are within the set synchronized window when performing the transfer from one source to the other.

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

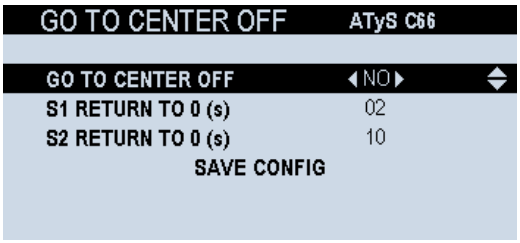
- Voltage range
- Frequency range
- Phase angle
- Phase rotation
- Dwell time
- Slip frequency

The status synchronism of the 2 sources can be viewed on dashboard 2.2 STATUS / SYNC::



GO TO CENTER OFF

This allows the transfer switch to go to center-off position (when available) when both sources are lost or not available such as when the source supplies are not within acceptable limits. This function can be used to avoid damage to the load due to unstable supplies and transients that may occur before a source is available and stable.



Associated timer to configure with Return to 0 function:

- RETURN TO 0 (s) (independent timers for S1 and S2): time to wait before activating center-off / zero position after a source is considered unavailable. (Countdown starts at same time as the failure timer)

Note This function will only work if both the switch and the controller are still supplied (by an external source, UPS or others, independent from the emergency and normal source).

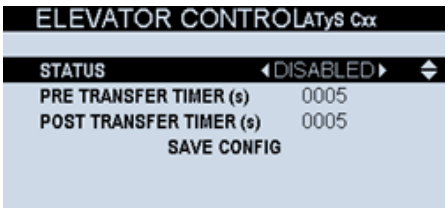
If the typology of the transfer switch (technology) does not allow the function, a message will pop up as follows:

Lift / Elevator Control

The elevator output signal is used to communicate to the elevator control panel in buildings that the controller is ready to perform a transfer. The elevator control panel may use this feedback to send the elevator to the next floor and open its doors to avoid having people trapped inside the elevator while the transfer takes place.

The function has 2 main parameters to be set on the function menu, the pre-transfer timer (time before sending the order to transfer to the switch, when the elevator output will become active) and the post-transfer timer (time after achieving the transfer to the other source, when the elevator output will be cleared, not active).

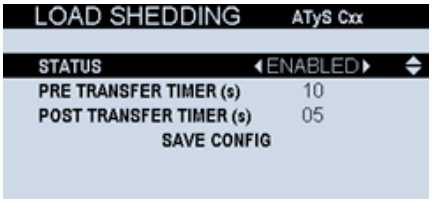
To be able to use the elevator signal function, it is required to configure an output as ELV – Elevator output in the PARAMETERS / I/O / I/O CONFIG menu.



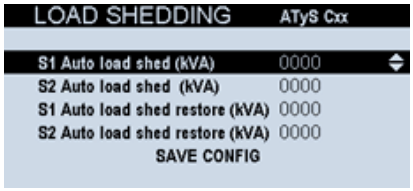
Load shedding

The ATyS C66 provides 2 types of load shedding features:

- **Forced load shedding:** This type of load shedding will activate the LSC - Load Shedding Contact / Forced Shedding output every time there is a transfer to the secondary source. The forced load shedding is used in cases where the load power is stable and the secondary source provides less power than the normal/ main source. The values to configure for this function are the pre-transfer and post-transfer timers (by default, 4 and 1s respectively).



- **Smart load shedding:** A kVA limit can be set based on the power capacity of S1 and S2 and when this limit is exceeded the controller can perform an automatic load shedding by activating an output. This output must be configured as PTS - Power Threshold Exceeded / Smart Shedding and will go to the switching device opening the circuit for the non-essential loads of the installation. The threshold and hysteresis defined will define the activation/deactivation of this output. The main use of this function is the same as forced load shedding with the difference that if the load required power is low it may not be necessary to shed the loads when transferring to the secondary source. In this case the controller will automatically detect the power level and will shed loads intelligently.



Note: for Smart load shedding based on kva it is necessary to use current transformers with the product. See chapter 7.3.

Power up in auto

Enabling “power up in auto” will force the controller to always restart in automatic mode every time the controller loses all power supply to the controller. Loss of power in this case includes draining of the built-in energy backup.

DBT Timer in CTRL

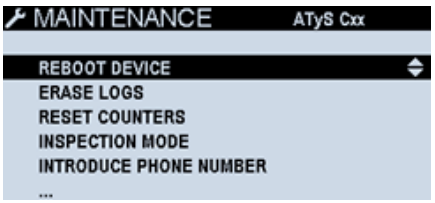
Dead Band Timer in CONTROL mode such as when manually operating the transfer through the controller HMI or via communication. This function will force the controller to take into account the dead band timer, which consists for instance in the "set time in center-off" when transferring from an available source to the other one.

HVAC compressor

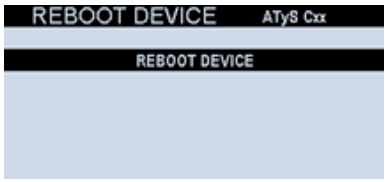
This is a specific function designed for use with equipment such as compressors for HVAC units. When returning to the priority source this output will become active prior to initiating the transfer. (This output will typically be used to shut down the compressors in a controlled way before initiation a transfer.) The transfer will then take place and after reaching the other source, a configurable timer will count down before deactivation of the output.

11.1.10. Maintenance Menu

The maintenance menu permits to perform service-reserved actions on the controller:

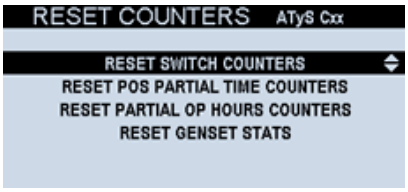


- Reboot device: permits a software reboot on the controller without erasing any information. A confirmation request will pop up when pressing OK on the function.



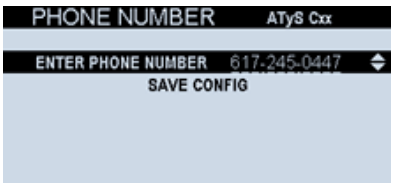
- Erase Logs: erases the event log or the alarm log. A second confirmation will be required.

- Reset counters: resets to 0 the counter values (switch, time in position, operational hours or genset statistics)

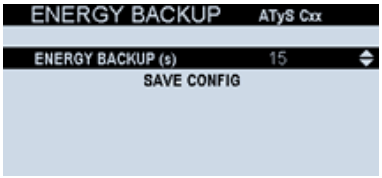


- Inspection Mode: after servicing the product, this menu can be used to add the last inspection date/time. This information can be consulted on the main menu / ABOUT section by all the users.

- Introduce phone number: a phone number may be configured by the user so as to appear in the ABOUT screen as a maintenance/service call phone number. This is intended to support the user in case there is a need for emergency or periodic service.



- Energy Backup: the energy backup is built-in to the controller and can be set from 0 to 30 seconds. By default this value is set to 15 seconds.



Inside the parameters there are alarms reserved for service (only accessible with the maintenance password) access path : Parameters/ Alarms / Maintenance Alarms. This allows the service to set up to 6 alarms of different or the same type.

The options are as follows:

- Cycles Exceeded: maximum number of operating cycles of the switch reached. A cycle considers going from one position to the opposite on and come back (for example “S1 – S2 – S1” or “S1 – OFF - S2 – OFF –S2). By default the number of cycles is set to 5000 cycles.
- Operations Exceeded: maximum number of operations (change of position, including the off position (if available) of the switching device. By default this is set to 10000.
- Genset runtime S1 or S2: total amount of times that the genset has been running (supplying or not the load). Can be used for genset maintenance purposes. By default it is set to 900000s (250h).
- Total time of genset supplying load on S1 or S2: total amount of time that the genset has been supplying the load. Can be used for genset maintenance purposes. By default it is set to 900000s (250h).
- Inspection time: 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 ATS. By default it is set to 300 months which is the maximum value. As standard, Socomec recommends 12 months maximum between servicing.

For more information about alarm configuration, see chapter 11.1.7.

11.2. 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.

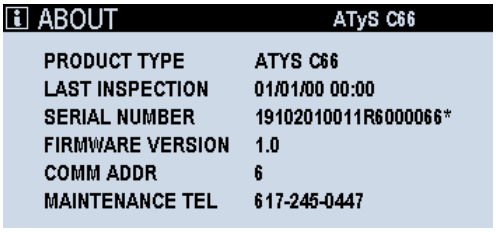
You can download EasyConfig for free from the following link:
https://www.socomec.com/easy-config-software_en.html

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:

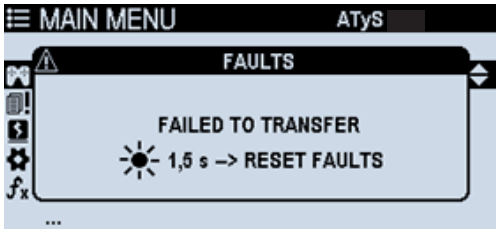
FAULT	DESCRIPTION (CAUSE)	ACTIONS	AC-KNOWLEDGE / CLEARED	FAULT LOG	POP-UP	FAULT LED	OUTPUT
Unexpected Transfer	The controller receives a feedback/return from the switch without sending any order (auto or manu). Also if loss feedback of current position.	Mode stays the same. Controller will start retries if position is un-known. If a position is reached, no retry takes place.	Can also be cleared through display or through RST - Reset Fault input.	Yes	Yes, "Unexpec-ted 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 clea-red 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 ope-ration 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 (confi-gurable through software)(value is dynamic).	Yes	Yes, "Max opera-tions 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 mainte-nance 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 (mainte-nance 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 Par-tial 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.

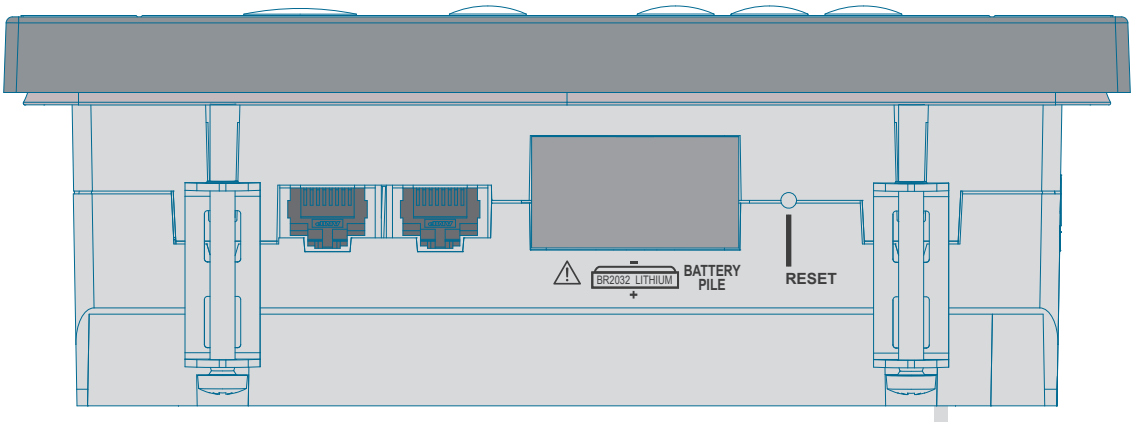
RTC Battery replacement

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.

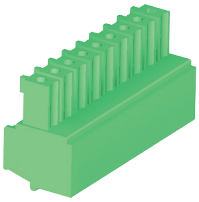
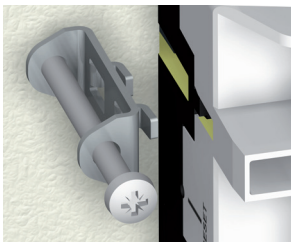
To replace the RTC battery:

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

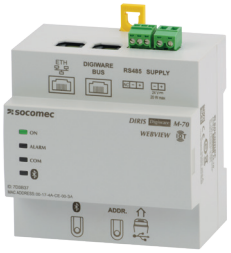
For battery replacement, use a BR2032 coin-type battery cell.



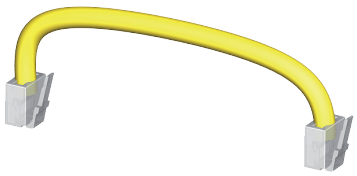
12.4. SPARE PARTS

Part Number	Image	Description
1609 0001		NEMA 3R 12 silicon sealing gasket for door mounting outdoors
1609 0002		Connector kit (including ATyS C66 but also ATyS FT/DT connectors that may be discarded 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 ATySC66 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:

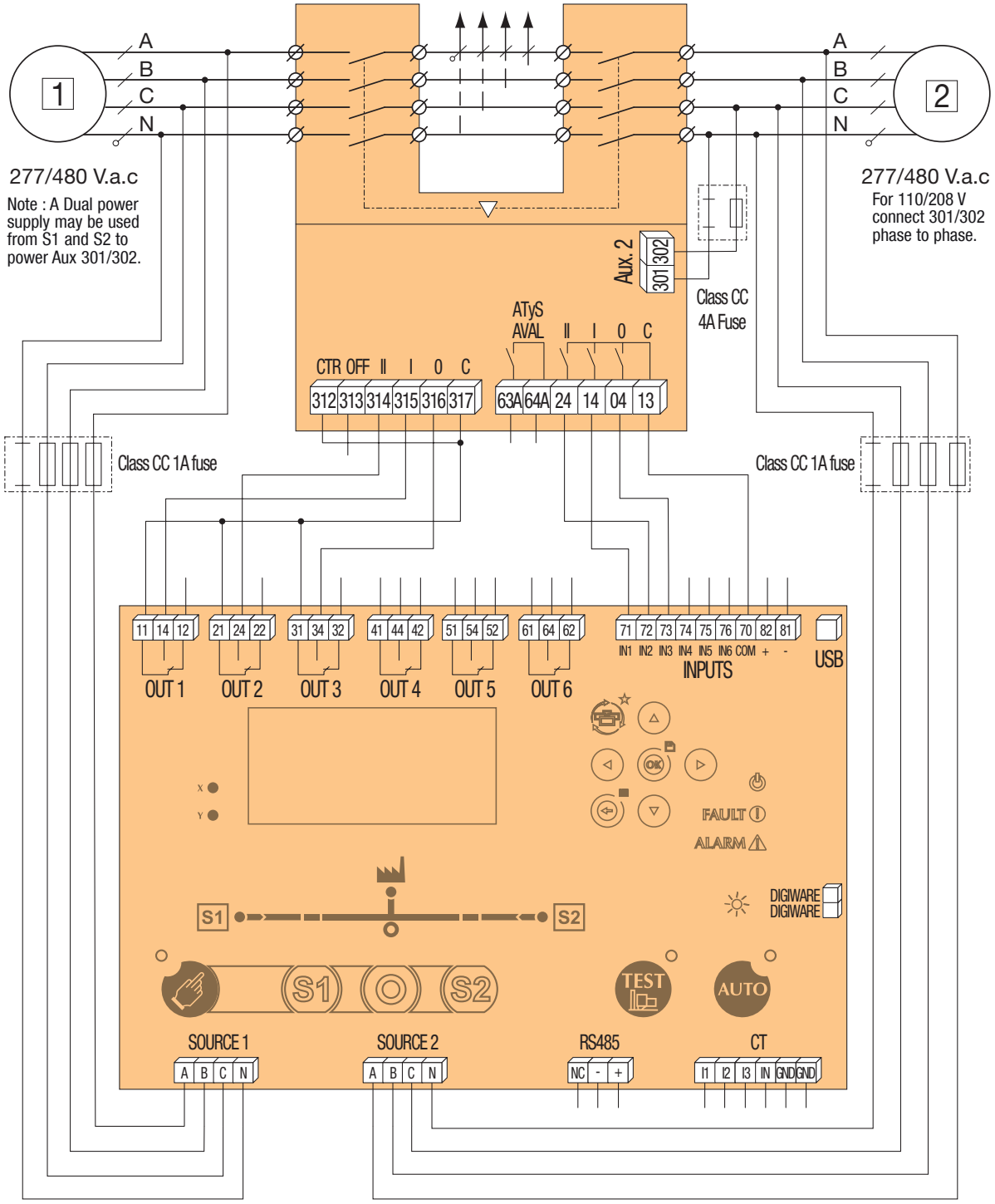
Length (m)	Quantity	Reference	
0.1	1	4829 0181	
0.2	1	4829 0188	
0.5	1	4829 0182	
1	1	4829 0183	
2	1	4829 0184	
5	1	4829 0186	
10	1	4829 0187	
50 m reel + 100 connectors		4829 0185	

13. ANNEXES

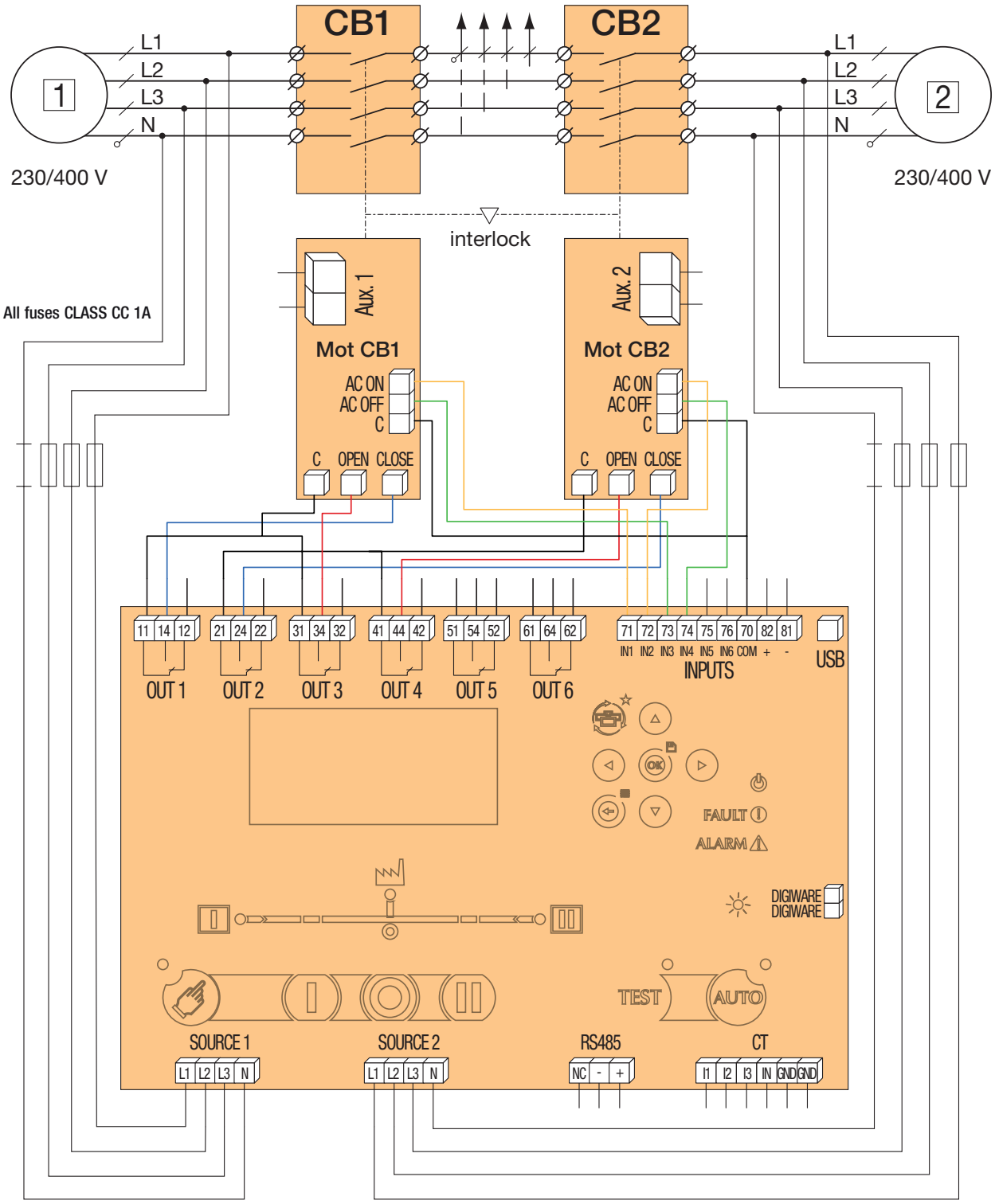
13.1. ANNEX I : Wiring Diagrams

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.

NOTE: 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	SELEC-TABLE 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, a dynamic 3 second 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	S2/S1 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 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 transfering 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	SELEC-TABLE RANGE	BY DEFAULT
1CT / 2CT	S1/S2 GENSET COOL-DOWN (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 “FAIL START” error message is displayed on the product LCD.	0-600sec	30sec

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.

SPECIFIC FUNCTIONS TIMERS

FUNCTION	TRI-GRAM (ECS)	TIMER	DESCRIPTION	SELEC-TABLE 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.	0-20min	3min
Elevator / Lift	ELD	ELEVATOR DELAY / Lift Pre Transfer	Elevator delay timer: If the output is used, the controller will send a signal to the elevator control panel through the ELEVATOR CONTROL output the value of this timer (sec) before a transfer will take place.	0-9999s	5sec
Elevator / Lift	ELR	ELEVATOR RESET / Lift Post Transfer	Elevator reset timer: If the output is used, the controller will open the output to finish the signal to the elevator control panel the value of this timer (sec) after a transfer takes place to an available source.	0-9999s	5sec
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
Forced load shedding	LSD	LOAD SHEDDING PRE-TRANSFER TIMER (s)	Load Shedding - Time Delay (before transfer) Timer. This time delay corresponds to the time available to perform any load shedding operations downstream before the RTSE starts to changeover.	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 retransfering 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

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	Read position 1 from the RTSE
AC2	SWITCH IN POS. 2	Read position 2 from the RTSE
AC0	SWITCH IN POS. 0	Read position 0 from the RTSE
AC0A	SWITCH A IN POS.0	Read position 0 from the SWITCH on S1
AC0B	SWITCH B IN POS.0	Read position 0 from the SWITCH on S2
MAN	DOOR OPEN / MANUAL MODE	Not in auto, 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 inhibit but navigation through the menu and dashboards on the display are allowed. This situation will remain until the input is cleared.
IEE	INH. GENSET SCH.	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.
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.
TP1	INPUT TRIP 1	Protection on S1 has tripped
TP2	INPUT TRIP 2	Protection on S2 has tripped
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	LIFT BYPASS	It will bypass the elevator 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 transfered to the opposite
IS2	INHIBIT S2	Inhibits source 2. Transfer to the source is forbidden and if the load is on that source it will immediately be transfered to the opposite
-	NONE	INPUT NOT USED
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 prefered 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.
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
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.
REC	AUTO/MANU	Places the controller in manual mode remotely.

13.4. ANNEX IV – Output list

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

TRIGRAM	OUTPUT NAME	DESCRIPTION
PO1	POS 1 ORDER	Switch position order to go to Source 1
PO2	POS 2 ORDER	Switch position order to go to Source 2
PO0	POS 0 ORDER	Switch position order to go to Source 0
PA0	POS 0 ORDER S1	Switch position order to go to center-off (source 1)
PB0	POS 0 ORDER S2	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.
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 siwtches 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 actice, 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 actice, 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 transfering to source 2 to load 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 speific fucntions menu.
FLT	FAULTS ACTIVE	At least 1 fault is active on the controller. Fault report
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" fucntion has to be enabled inside the Specific functions menu.

TRIGRAM	OUTPUT NAME	DESCRIPTION
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 going on.
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	LIFT	Elevator signal output. It should be linked to the building's elevator/lift control panel to inform that the controller is about to launch a transfer and oblige the lift control panel to send the lift to the next floor and open its doors.
ARO	ALARM OUTPUT 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.
AUD	CRITICAL ALARM ACTIVE	Output active when an alarm with the criticity CRITICAL is active.
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.

Note

Position orders should not be used with OUT 5 and OUT 6 as these are 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

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

CORPORATE HQ CONTACT:
SOCOMEC SAS
1-4 RUE DE WESTHOUSE
67235 BENFELD, FRANCE

www.socomec.com

549868B

socomec
Innovative Power Solutions