INSTRUCTION MANUAL EN

# ATyS C55/65

## ATS Controller

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# 1. GENERAL SAFETY INSTRUCTIONS

- This manual provides instructions on safety, connections instructions on the SOCOMEC ATyS C55 / C65 ATS controller.
- Whether the ATyS C55 / C65 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 C55/C65
- The ATyS C55/C65 meets the requirement for the IEC 60947-6-1 standard for transfer switching equipment and the IEC 61010-2-201 standard for control equipment; the product includes the labels and marking with details on each standard.
- No covers on the ATyS C55/C65 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 C55/C65 when voltages 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:**<br>**Electric shock, burns, death** | **RISK:**<br>**Possible personal injury** | **RISK:**<br>**Equipment damage** |

- The ATyS C55/C65 complies with the following international standards:

  - IEC 60947-6-1 – Transfer switching equipment
  - EC 61010-2-201 – Control equipment
  - IEC 61010-1 – Electrical safety requirements
  - Annex C of GB/T 14048.11

Refer to the specific references numbers on this document to order the correct products and associated accessories.

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 C55 and C65 ATS controllers are compliant to international product standards and are 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.

Besides product standards the C55 and C65 are designed to meet IEC 60364 and IEC 61439 installation standard requirements (C55/65) as well as NFPA 110 and NFPA 70 (NEC) when using the specific UL reference (C66).

**ATyS C55/65 range of automatic transfer switch (ATS) controllers ensure:**

- Safe controls for transfer between a normal and alternate source
- A manufacturer assembled and tested solution
- 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 (IP65) with gasket.

**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

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# ATyS C55/65

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 C55 or C65 Controller
Qty 1 x Controller IP65 gasket (C65 only)
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

* For further details refer to the product instruction manual under chapter "Spares and Accessories"

## Spares

- Connector kit (ref. 16090002)
- Controller backplate mounting feet (ref. 16090005)
- Controller door mounting screws (ref. 16090004)
- Controller IP65 gasket (ref. 16090001) (C55/65)

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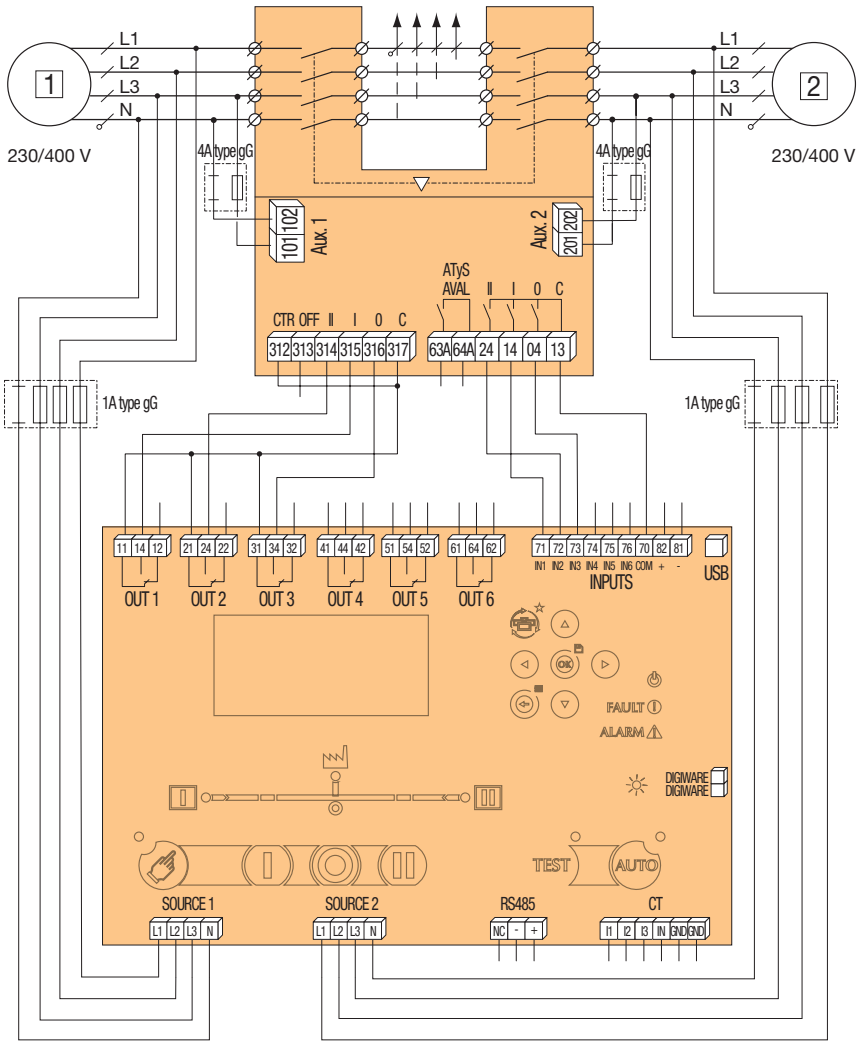
## Installation and Commissioning

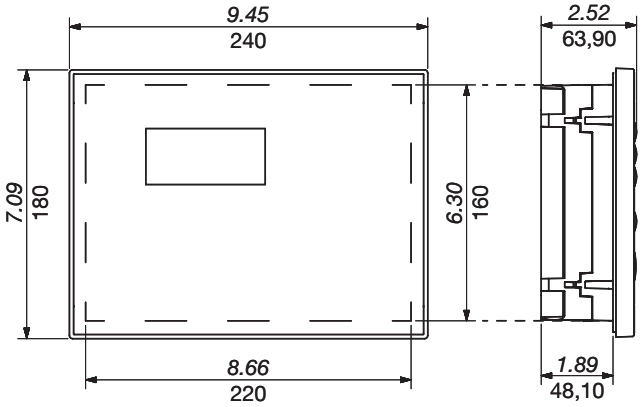
STEP 1 Installation — STEP 2 Connections — STEP 3 Configuration — STEP 4 Visualization — STEP 5 Menus & programming

## Connection diagram with ATYS d



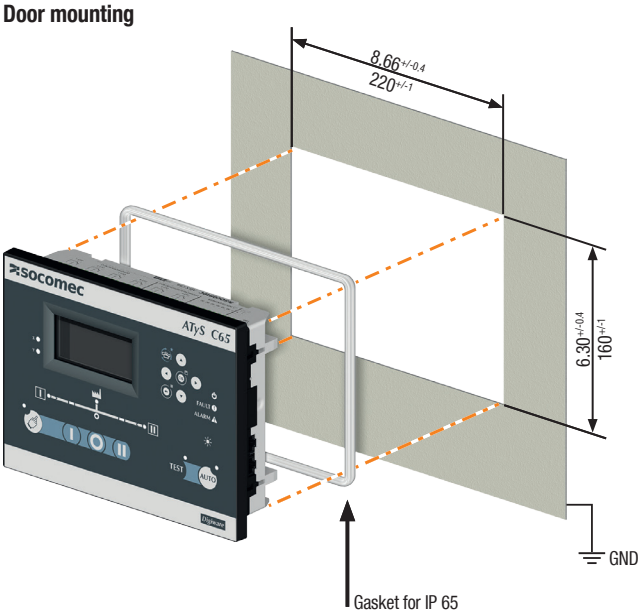
## STEP 1A Product dimensions

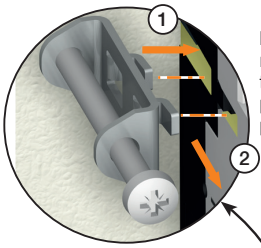
Dual Dimensions
in/mm




## STEP 1B Mounting & connecting controller

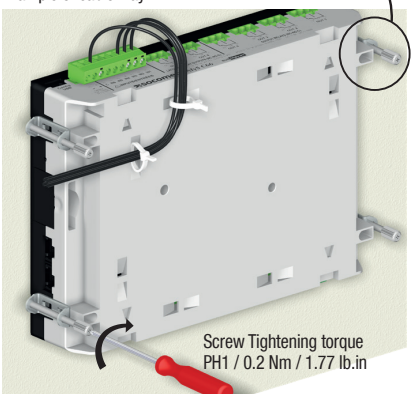
### Door mounting



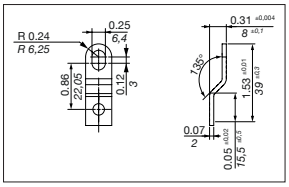



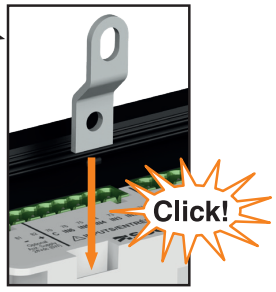

Insert the 4 door mounting screws in the designated slot and push back to lock in place.

Example of cable way.

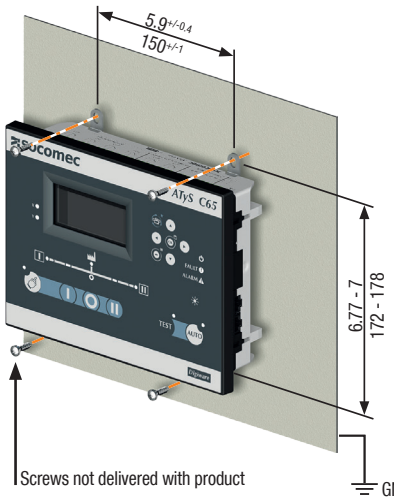



### Backplate mounting

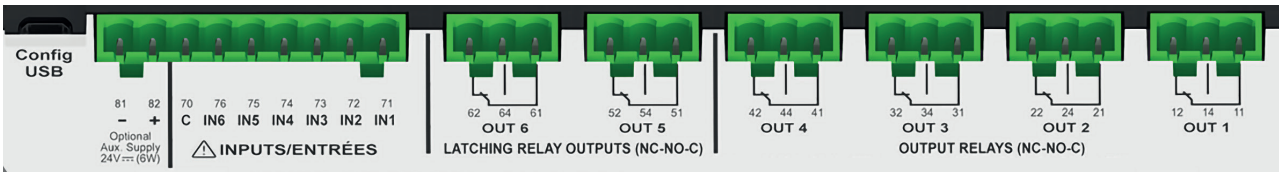


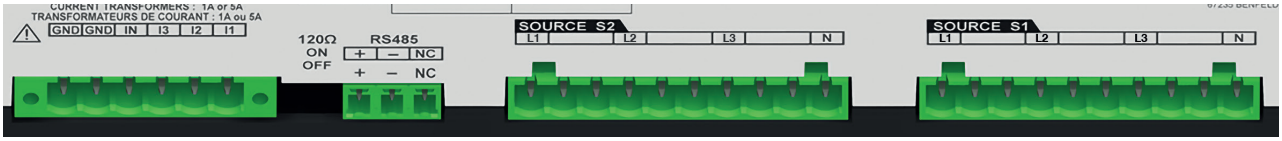

Clip the mounting feet in the designated slot



## STEP 2 Controller wiring




Top view

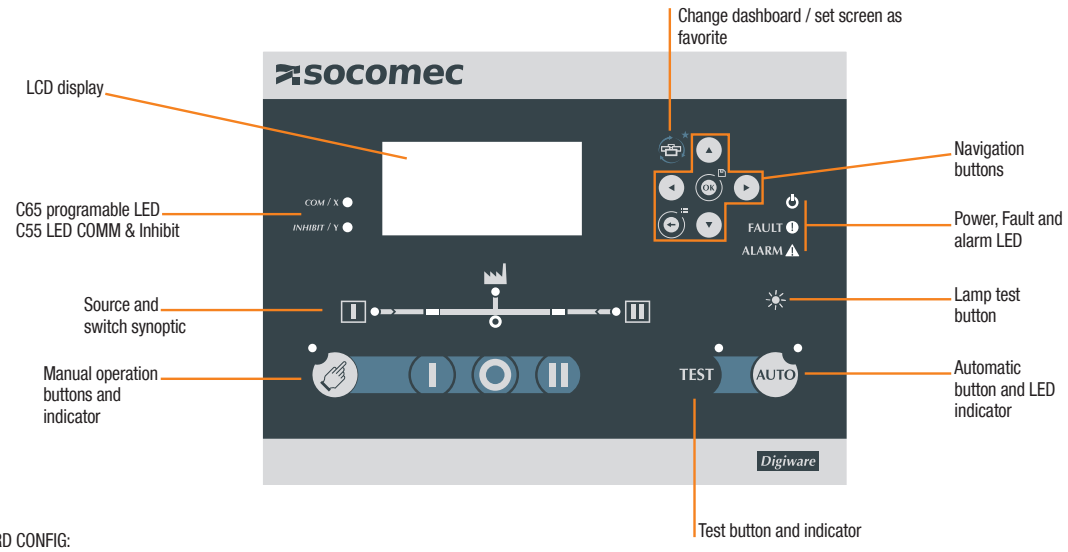



Bottom view

| 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<br>AWG 16-14<br>Tightening torque<br>0.5-0.6 Nm<br>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<br>+: positive terminal of aux supply | 12-24 Vd.c. | |
| Outputs | 12/14/11 | OUT1: reserved (switch ODR1) | Dry contacts<br>8A / 277 VAC 50/60 Hz<br>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<br>-: negative terminal of RS485 bus<br>+: positive terminal of RS485 bus<br>NC : Ground | RS485 bus insulated | LiYCY sheilded twisted pair 0.14 to 1.5 mm² / 30-14 AWG<br>Tightening torque<br>0,22 -0,25 Nm<br>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 | MIMIC |
|---|---|
| <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 |

* C65 only

## STEP 5 Menus & programming

**MAIN MENU**
- CONTROL
- LOG
- GENSET SCHEDULER
- PARAMETERS
- SPECIFIC FUNCTIONS

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

**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 *
- LIFT CONTROL *
- FORCED LOAD SHEDDING *
- SMART LOAD SHEDDING *
- POWER UP IN AUTO
- DBT TIMER IN CTRL *
- 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
- TESTS ON LOAD
- TESTS OFF LOAD

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

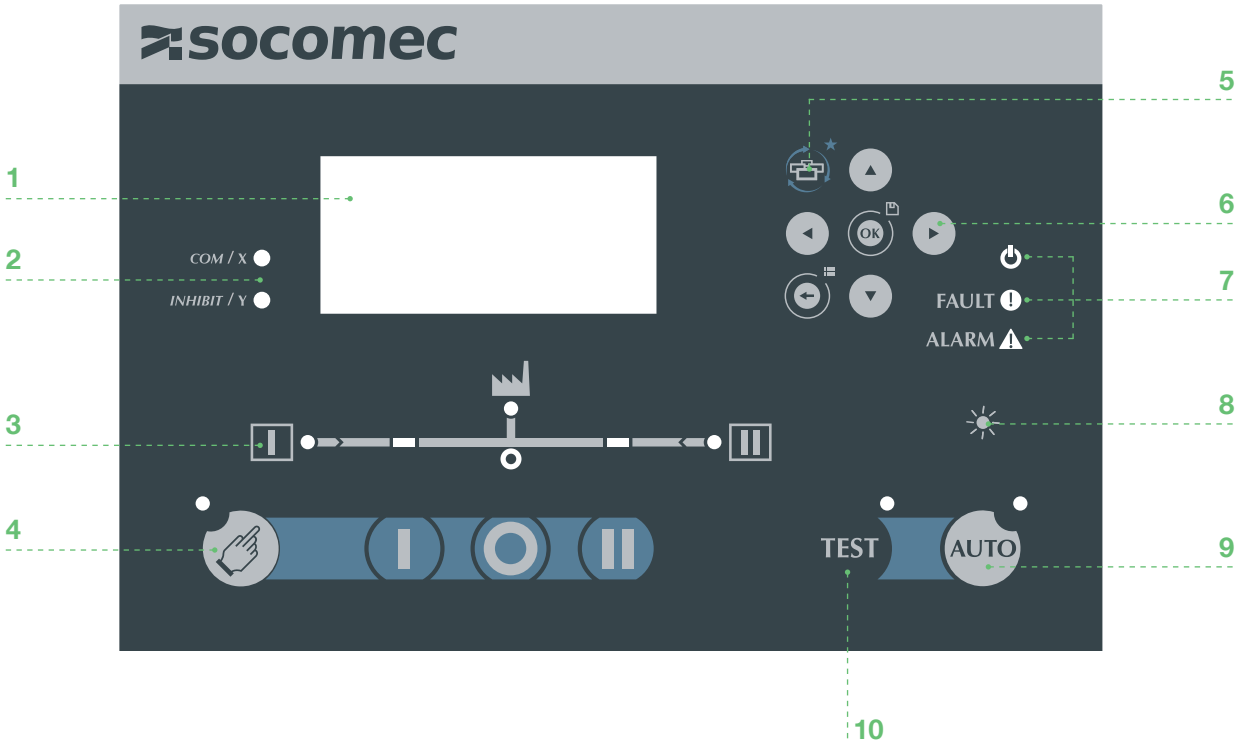
* C65 only

# 4. GENERAL OVERVIEW

The ATyS C55/C65 ATS Controller reference includes:

- 1 ATS Controller
- 1 ATyS C65 IP65 gasket (available as accessory for C55)
- 1 ATyS Cx5 door mounting kit
- 1 ATyS Cx5 backplate mounting kit
- Quickstarts instruction sheet

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




1. LCD display
2. C65 programable LED's / C55 Fixed LED's for COMM & Inhibit
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 C55/65 controllers meet the following environmental requirements:

## 5.1. IP Rating

- IP65 door mounted with gasket.
- IP30 door mounted without gasket.
- IP2X on the back of the controller.

## 5.2. Operating Conditions

### 5.2.1. Temperature

- From -30 to +70°C

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

### 5.2.2. Hygrometry

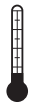
- 95% humidity without condensation at 55°C

### 5.2.3. Altitude

- Up to 2000m

## 5.3. Storage Conditions

### 5.3.1. Temperature



- From -40 to +70°C

### 5.3.2. Hygrometry

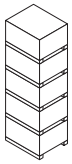
- Recommendation: to be stored in dry, non-corrosive and non-saline atmospheric conditions.

### 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 (kg) | | Volume (mm) inc packing |
|---|---|---|---|---|
| | | Net | Gross | |
| ATyS C55<br>ATyS C65 | 1600 0055<br>1600 0065 | 1,060<br>1,080 | 1,500 | 295x255x115 (LxWxH) |

# 6. STANDARD COMPLIANCE AND MARKING

CE marking

Cmim

EAC

Lead free process

WEEE Directive 2012/19/EU

**Standards compliance**

Certified according to :

IEC 61010-2-201

IEC 61010-1

GB/T 14048.11 Annex C

Conform to the requirements of :

IEC 60947-6-1 when used with an IEC 60947-6-1 certified RTSE (Remotely operated transfer switch).

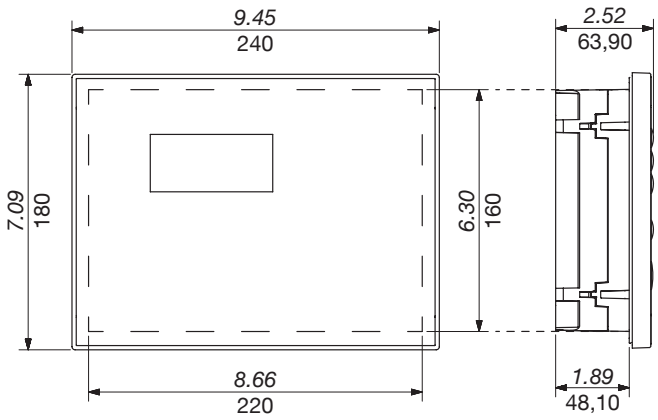
NFPA 70* (Specific UL Reference).

NFPA 110* (Specific UL Reference).

(*) For a UL certified product, SOCOMEC provide reference 1600 0066 (ATyS C66, that is UL61010 listed and UR 1008 recognised as a standalone ATS controller as well as UL1008 listed in association with ATyS FT or ATyS DT transfer switching equipment)

# 7. MOUNTING AND CABLING THE CONTROLLER

## 7.1. Product dimensions (in/mm)




## 7.2. Mounting the product

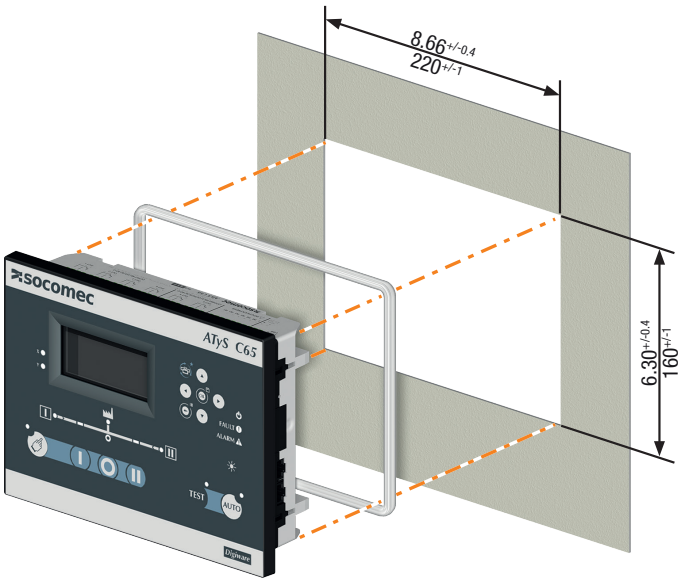
The ATyS C55/65 can be mounted either on the door or on the backplate of an enclosure (both mounting kits are delivered with the product).

### 7.2.1. Door mounting

The ATyS C55/C65 can be mounted on doors up to with a thickness 4mm (0,15in).

**STEP 1: Cut out for the controller**

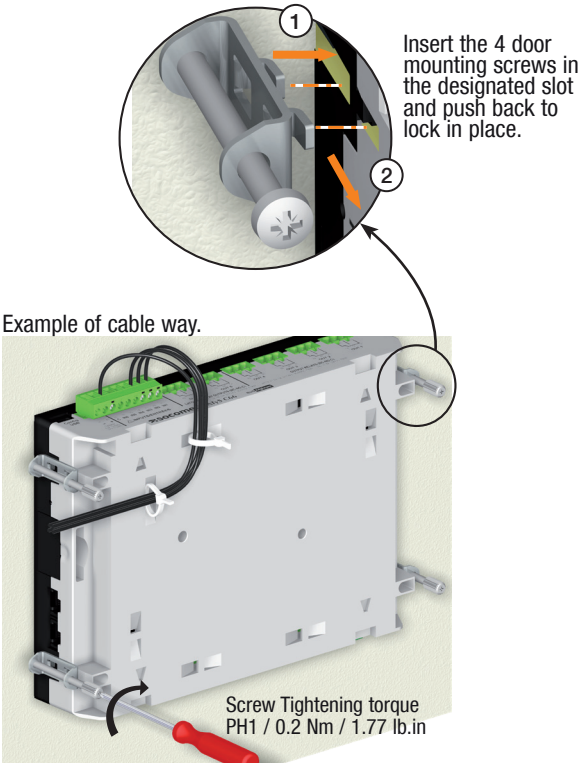
Cut a rectangle hole of 220x160mm / 8.66 x 6.3in on the enclosure door as shown below.




**CAUTION** For IP65 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:**

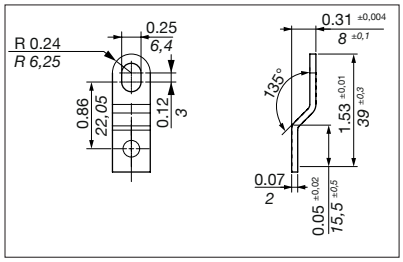
Place the ATS controller inside the door cut-out and clip the door mounting screws into the side of the controller (2 screws on each side). It is important to respect the tightening torque indicated below and follow good engineering practise when installing the ATS controller.

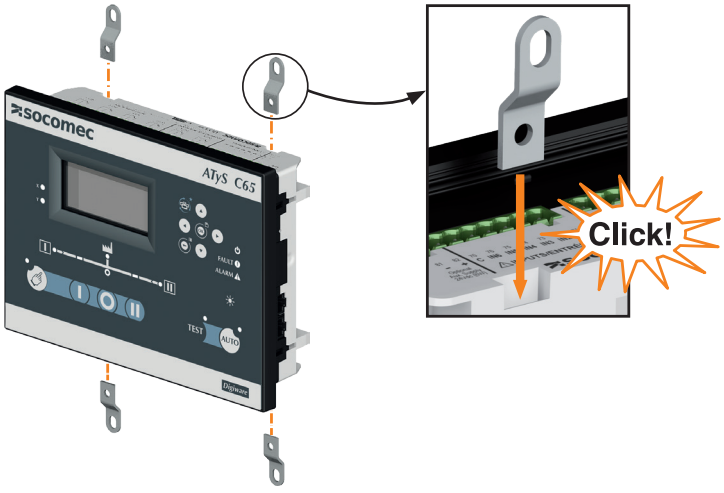



## 7.2.2. Backplate mounting

**STEP 1: Placing the 4 mounting legs on the controller**

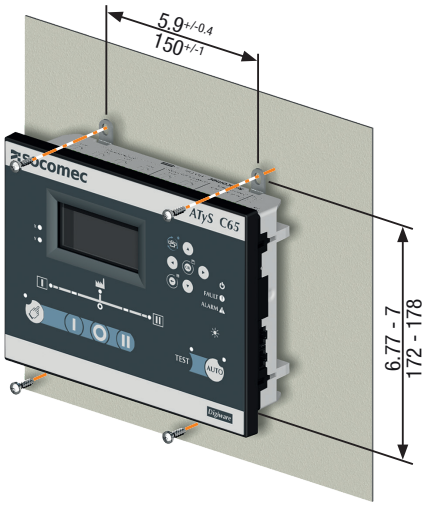
Insert the mounting legs into the 4 slots (2 top side and 2 bottom side (cf bellow top side view).



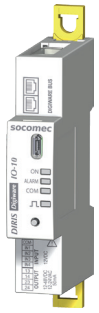
### STEP 2: Fixing the controller on the backplate

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.




**Mounting of Digital I/O extension modules (Accessory available for C65):**

Digital I/O modules are accessories delivered with the product. These optional modules can be ordered using the references below:

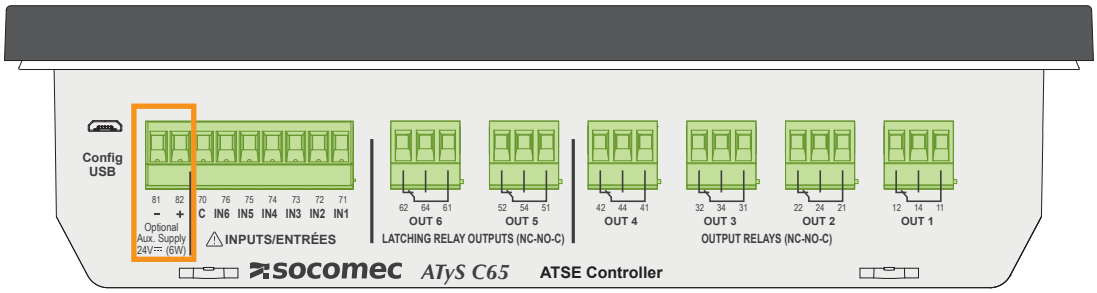
| IO input/output modules |
|---|
|  |
| **DIRIS Digiware IO-10**<br>**Digital inputs/outputs**<br>DIRIS Digiware IO-10<br>Ref. 4829 0140 |

Digital I/O modules provide additional inputs /outputs to be used with/by the ATyS C65.

To reduce the electromagnetic emissions, it is recommended to minimise the distance between modules and controller. The maximum length of the digiware bus is 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 C55/C65 controller must be supplied with 24 VDC.**

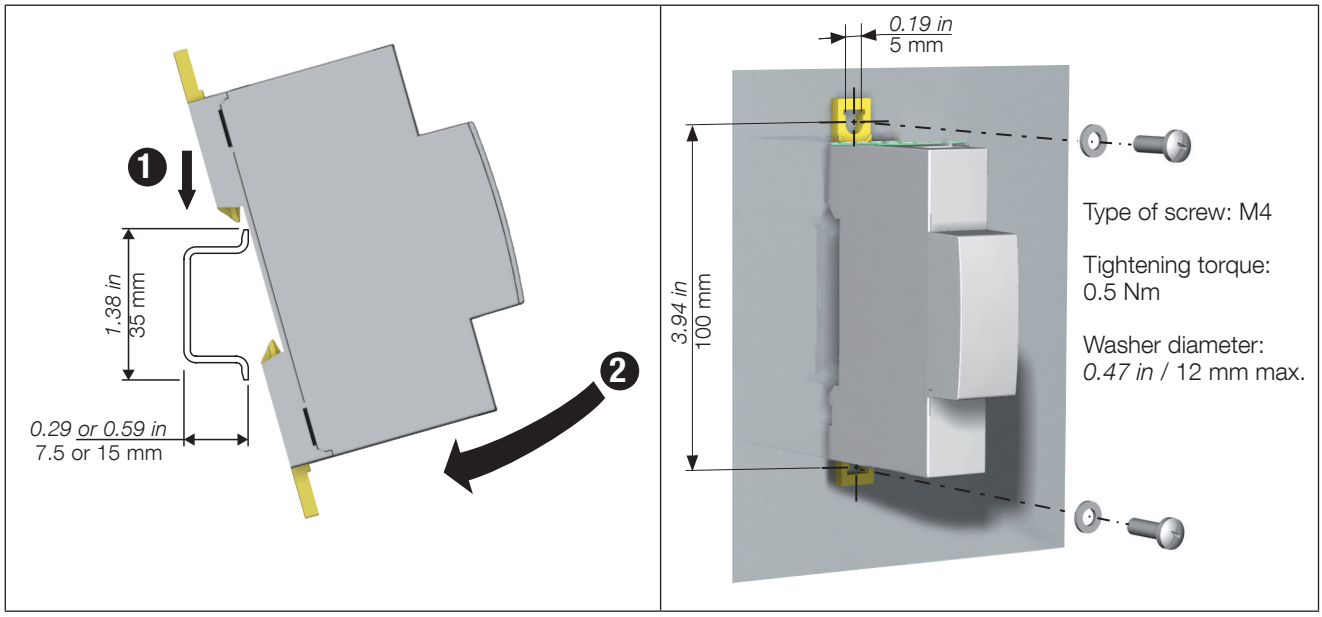



An end-of-the-bus resistor is necessary for a correct communication between the modules and the controller:

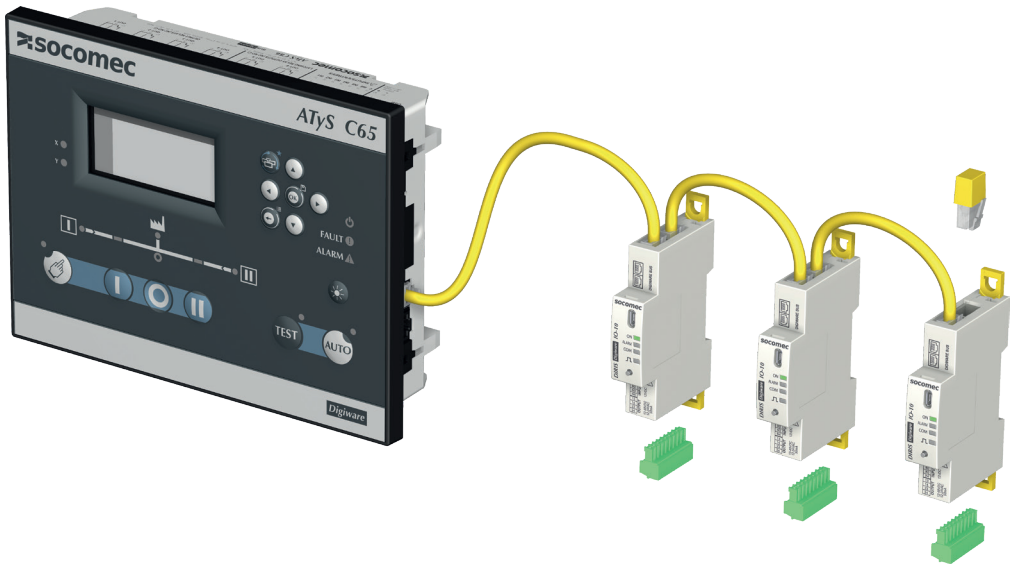
| | Quantity | Part number |
|---|---|---|
| | 1 | 4829 0180 |

**Mounting the I/O modules:**

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

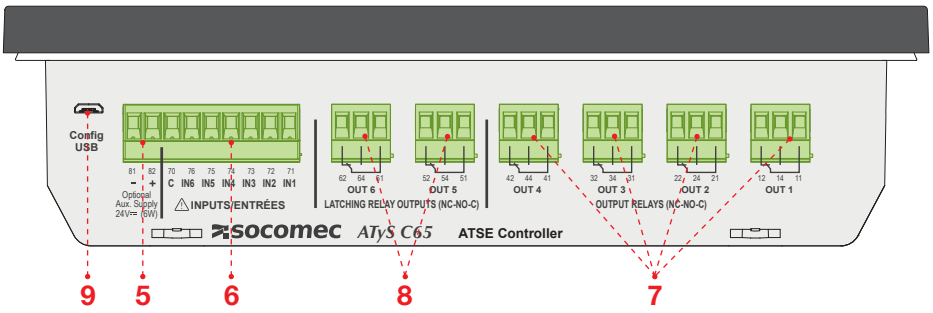



The connection between modules and to the ATyS C65 Digiware input is on the side of the controller by means of an RJ45 connector and after this the other modules are daisy chained (up to 6 modules).

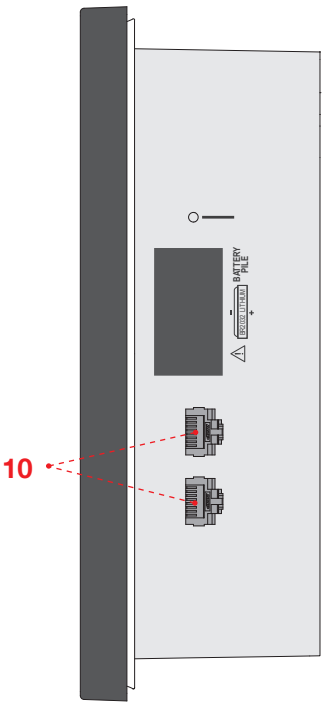


## 7.3. Terminal Connections

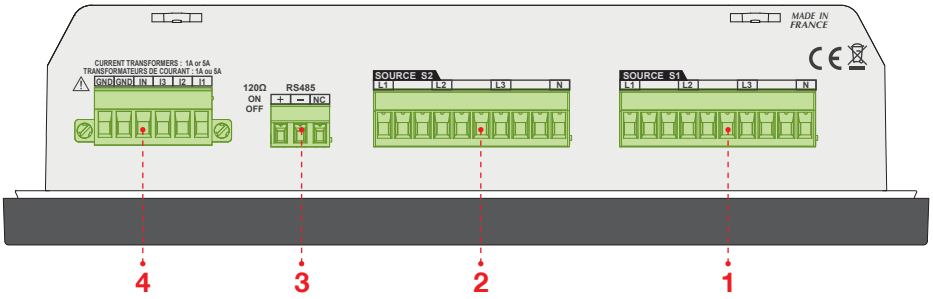
Top view:




Right side view:




Bottom view:




To help secure the control cables during the wiring, the controller includes seven fixing supports on the back of the controller to retain the cables in place using cable ties.

| N° | DENOMINATION | TERMINAL | DESCRIPTION | CHARACTERISTICS | RECOMMENDED CABLE SECTION |
|---|---|---|---|---|---|
| 1 | VOLTAGE SENSING SOURCE 1 | L1 / A | Phase 1 / A | 1Ph / 3Ph<br>50 - 332 / 575VAC<br>(50/60 Hz)<br>(+/- 10%)<br>Impulse V. Withstand Test: 6/8kV*<br>Ui 600V | 1 - 2,5 mm²<br>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<br>50 - 332 / 575V<br>575VAC<br>(50/60 Hz)<br>(+/- 10%)<br>Impulse V. Withstand Test: 6/8kV<br>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<br>Tightening torque<br>0,22 -0,25 Nm<br>1.9-2.2 Lb.in |
| | | - | DATA - (B) | | |
| | | NC | Ground | | |
| 4 | CURRENT TRANSFORMERS | I1 /Ia | CT phase 1 / A | CT Input /1A or /5A | 1,5-2.5mm²<br>AWG 16-14<br>Tightening torque<br>0,5-0,6 Nm<br>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<br>24VDC -20%/+20%<br>for I/O modules | |
| | | 82 | + | | |
| 6 | PROGRAMMABLE INPUTS | 70 | COMMON | Do no connect to any power supply.<br><br>To be used with<br>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/<br>11-14 NO | Output 1 | Dry contacts<br>8A / 277 VAC 50/60 Hz<br>5A / 24 VDC | |
| | | 21-22 NC/<br>21-24 NO | Output 2 | | |
| | | 31-32 NC/<br>31-34 NO | Output 3 | | |
| | | 41-42 NC/<br>41-44 NO | Output 4 | | |
| 8 | LATCHING RELAYS | 51-52 NC/<br>51-54 NO | Output 5 | | |
| | | 61-62 NC/<br>61-64 NO | Output 6 | | |
| 9 | CONFIG USB | MicroUSB | USB 2.0 for configuration | - | MicroUSB Type B |
| 10 | DIGIWARE BUS | BUS | 2x RJ45<br>DIGIWARE BUS | CAT V - 600V RJ45 UTP | RJ45 DIGIWARE CABLE |

NOTE 1: Use 7mm as stripping length for the controller terminals

NOTE 2: Use 90°C copper wire for installations with ambient temperature from 35-60°C.
When the ambient temperature is above 60°C, Use 105°C copper wire.

NOTE 3: * Impulse voltage withstand tests at 6kV between phases of the same source and 8kV between phases of a different source.

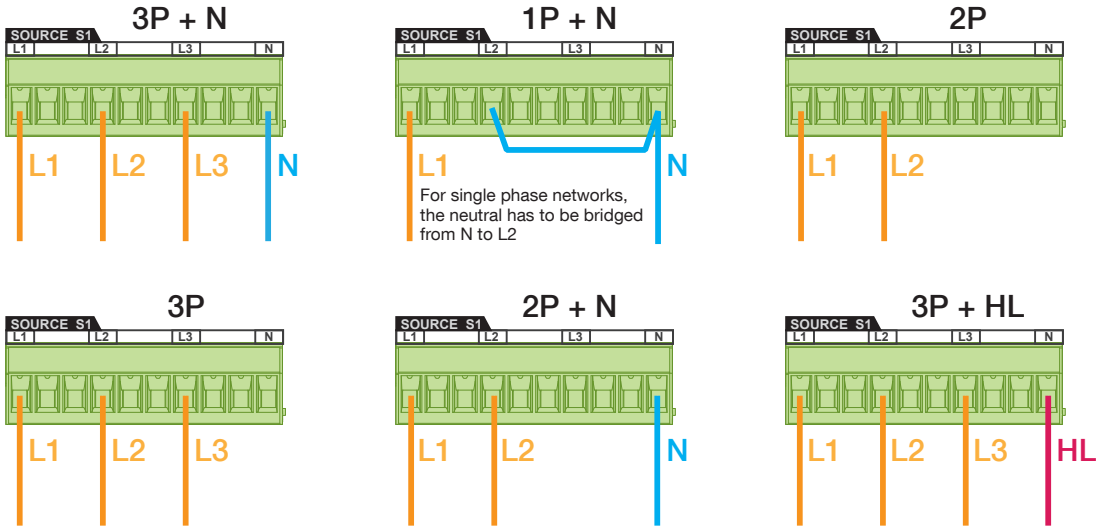
### 7.3.1. Power Supply

The ATyS C55/65 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 C55/65 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 source supply the device.

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



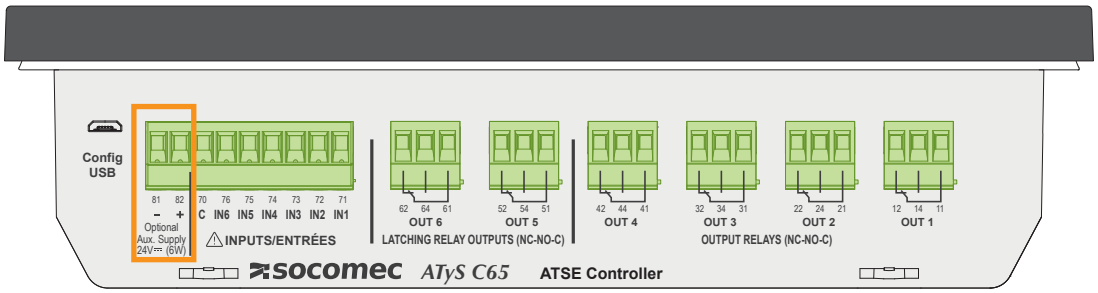

**Note** The C55/65 standalone ATS controller must include a SCPD such as fuses on each phase of the voltage sensing control wiring. 1A gG fuses are recommended.

#### 7.3.1.2. DC Power Supply

The ATyS C55/65 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 using the C55/65 with additional external I/O 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 C65 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 C65/66 controller excluding accessories.

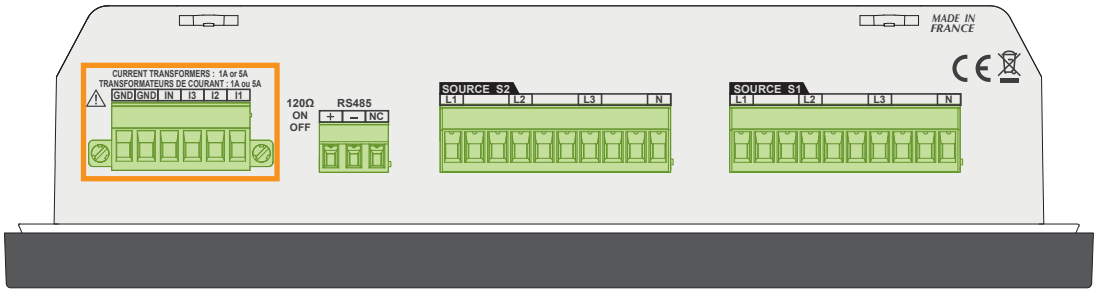
**Note** After these 15-30 seconds, the relays outputs and the inputs will no longer be operational and the 2 latching relays (OUT5 and OUT6, contacts 51-54 and 61-64) will automatically change state to start the generator(s) using their own latching relay backup power.

### 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%

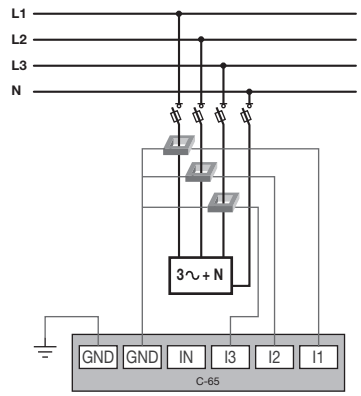
Recommended cable cross sectional area: 1,5mm$^2$.



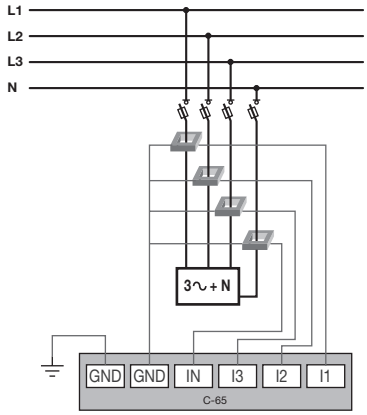

The configuration for the measurement should be done in the Parameters/Load menu (see chapter 11.1.2).

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

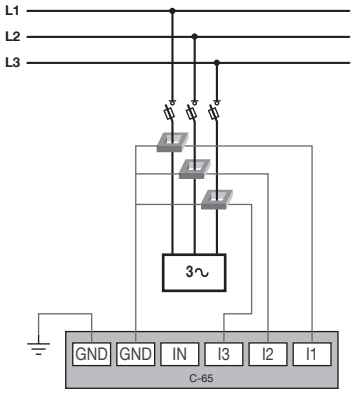
### 3P + N – 3CT



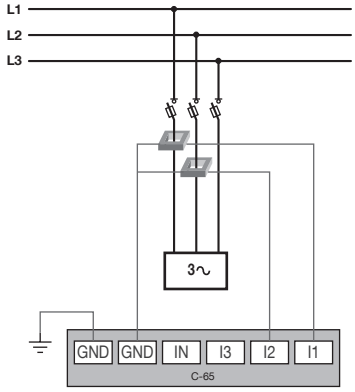

### 3P+N – 4CT



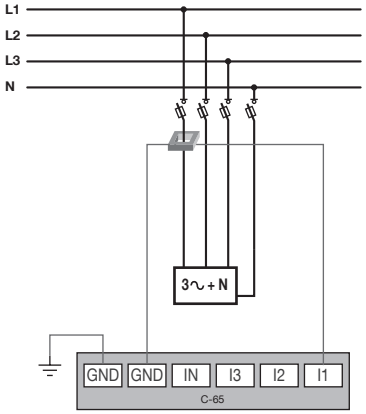

### 3P – 3CT



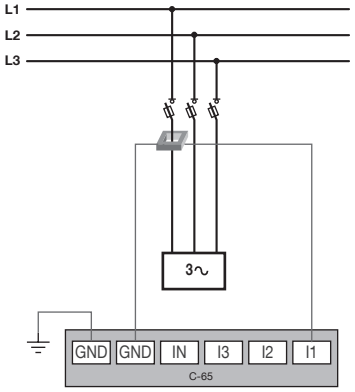

### 3P – 2CT



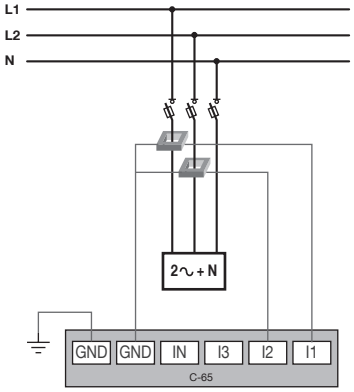

### 3P + N – 1CT



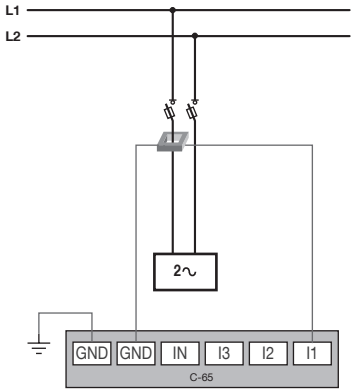

### 3P – 1CT



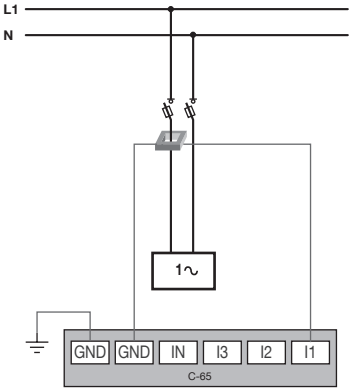

### 2P + N – 2CT



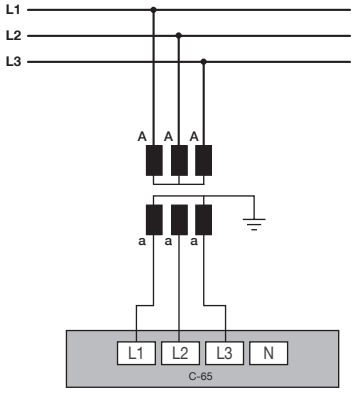

### 2P – 1CT




### 1P + N – 1CT

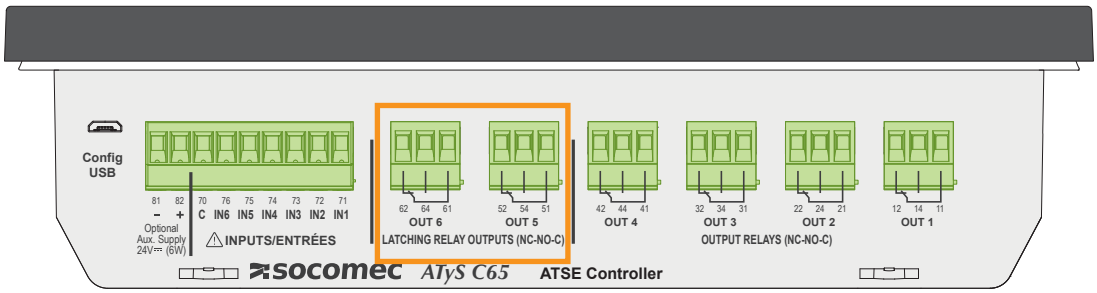



### VT - VOLTAGE TRANSFORMER




**WARNING** One of the GND inputs must be grounded.

## 7.3.1.5. Command circuits




By default, the inputs and outputs in the C55/65 are set up as follows:

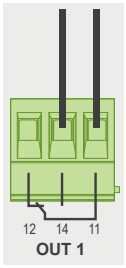
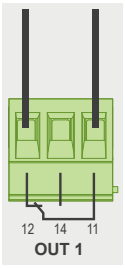
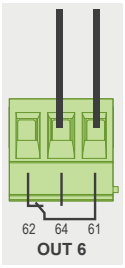
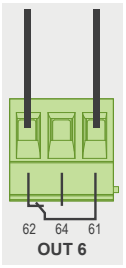
| | | BY DEFAULT | CONFIGURATION CHANGES WHEN CHANGING RTSE TECHNOLOGY | | | |
|---|---|---|---|---|---|---|
| | | ATyS r/d | Breakers | Contactors | ATyS FT | ATyS DT |
| INPUTS | Input 1 | SWITCH IN POS 1 | SWITCH IN POS 1 | SWITCH IN POS 1 | SWITCH IN POS 1 | SWITCH IN POS 1 |
| | Input 2 | SWITCH IN POS 2 | SWITCH IN POS 2 | SWITCH IN POS 2 | SWITCH IN POS 2 | SWITCH IN POS 2 |
| | Input 3 | SWITCH IN POS 0 | SWITCH A IN POS 0 | - | - | SWITCH IN POS 0 |
| | Input 4 | INHIBIT | SWITCH B IN POS 0 | - | - | - |
| | Input 5 | MANUAL RETRANS(1) | - | - | - | - |
| | Input 6 | DOOR OPEN | - | - | - | - |
| OUTPUTS | Output 1 | POS 1 ORDER | POS 1 ORDER | POS 1 ORDER | POS 1 ORDER | POS 1 ORDER |
| | Output 2 | POS 0 ORDER | POS 2 ORDER | POS 2 ORDER | POS 2 ORDER | POS 2 ORDER |
| | Output 3 | POS 0 ORDER | POS 0 ORDER S1 | - | - | POS 0 ORDER S1 |
| | Output 4 | FORCED SHEDDING (C65)(1) S1 AVAILABLE (C55) | POS 0 ORDER S2 | | | POS 0 ORDER S2 |
| | Output 5 | LIFT (C65) S2 AVAILABLE (C55) | - | - | - | - |
| | Output 6 | GENSET START | - | - | - | - |
| | Logic | Impulse(2) | Impulse | Maintained | Impulse | 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 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 C55/C65 controllers have 3 genset start security levels to ensure power continuity to the loads. Outputs 5 and 6 (by default to be used as genset start/stop relays, but still configurable by the user) will become active when the device sends a genset start order, when the device loses all both AC supplies and if the firmware doesn't force this activation, it will electronically close the NO output them after 10-15min of no-supply.

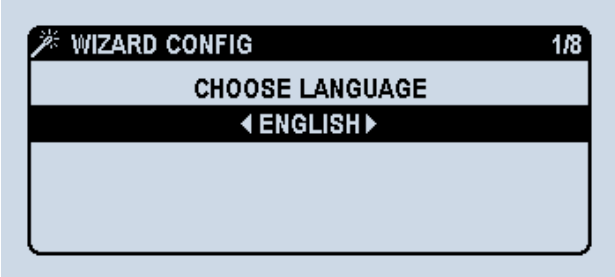
**CAUTION** **It is highly recommended to cable the outputs 5 and 6 as NO (Normally Open) to benefit from the above feature.**

# 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 9 languages:

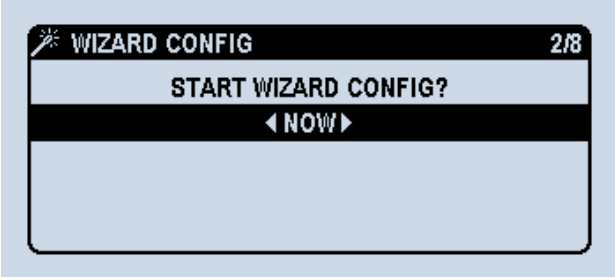
- English
- French
- German
- Italian
- Polish
- Spanish
- Turkish
- Chinese
- Portuguese




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

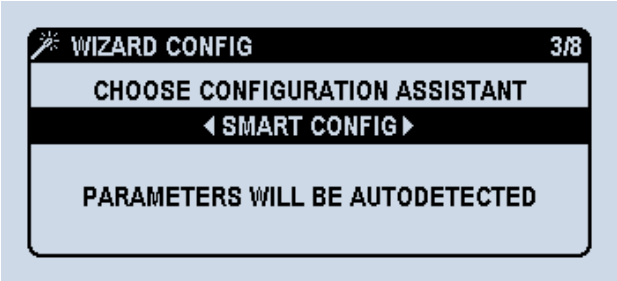
The wizard will always be accessible anyway inside the menu PARAMETERS/WIZARD in case it is missed the first time.



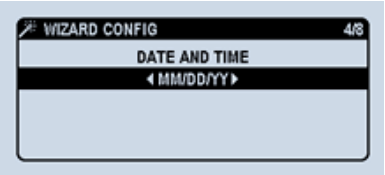

In case the decision taken is to begin with the wizard configuration, then the options are:

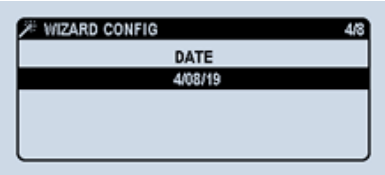
- To use the smart configuration: parameters like voltage, frequency and phase rotation will be auto detected and proposed to the user.
- To use the manual configuration: the user needs to enter the values manually.

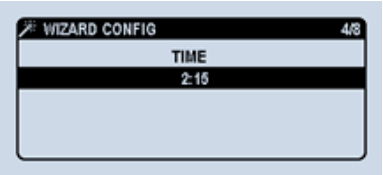
The controller will require the configurator 4-digit password before the configuration (by default, 1000).




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

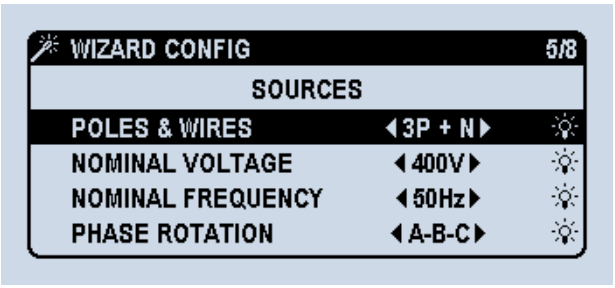



These time/date values will be saved and from that moment the RTC battery will keep the clock running even if the supply to the controller is lost.

Once these parameters are set, the next step is the sources 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 as source 1 and from a diesel generator as source 2.
- 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.

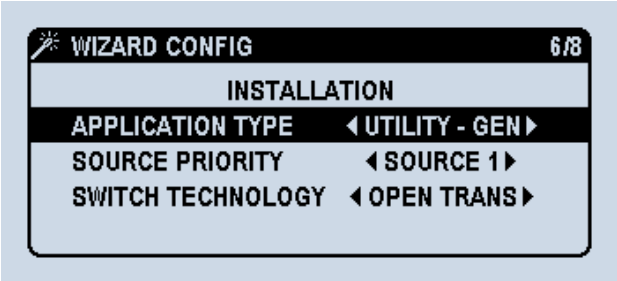
NOTE: It is possible to connect either the transformer or the genset to both source 1 or 2.

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

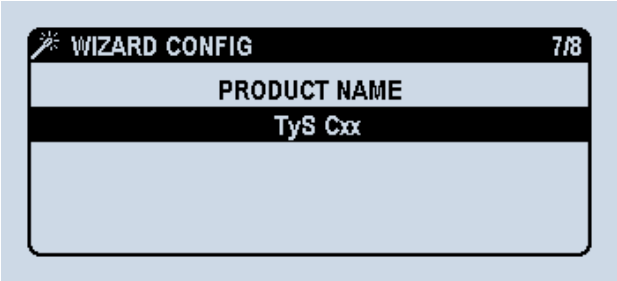
Switch technology stands for the type of switch used with the controller. The options are:

- ATyS r/d: to be selected when using a motorized RTSE such as ATyS r, ATyS d/dM/dH, ATyS S or 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).
- 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.

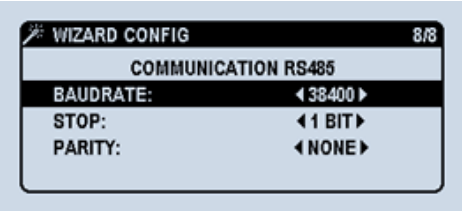
According to this configuration, the INPUTS and OUTPUTS of the controller to pilot the switch and receive the position feedback will be automatically configured to match the application requirements (see values by default in chapter 7.3 and I/O detail in chapter 12) but they can always be modified in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

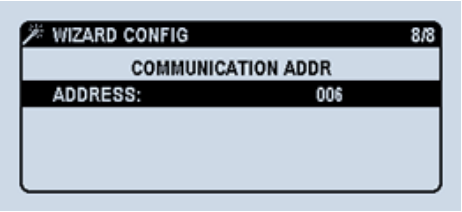



The 7th step is not affecting the functioning of the transfer switch but permits the user to select a name for the product. As default, it's ATyS C55/65, but it can be changed for any combination of letters, numbers and signs, for instance, "Cooling", "Line 1" or "DTC/21".

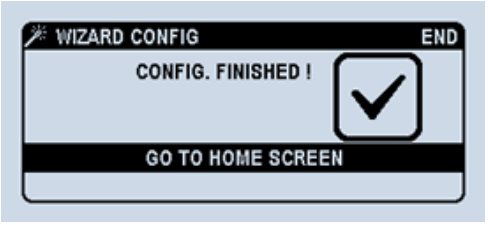



To finalize the configuration, the wizard asks for the communication parameters, such as the slave address (by default 6) and the communication parameters:




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).

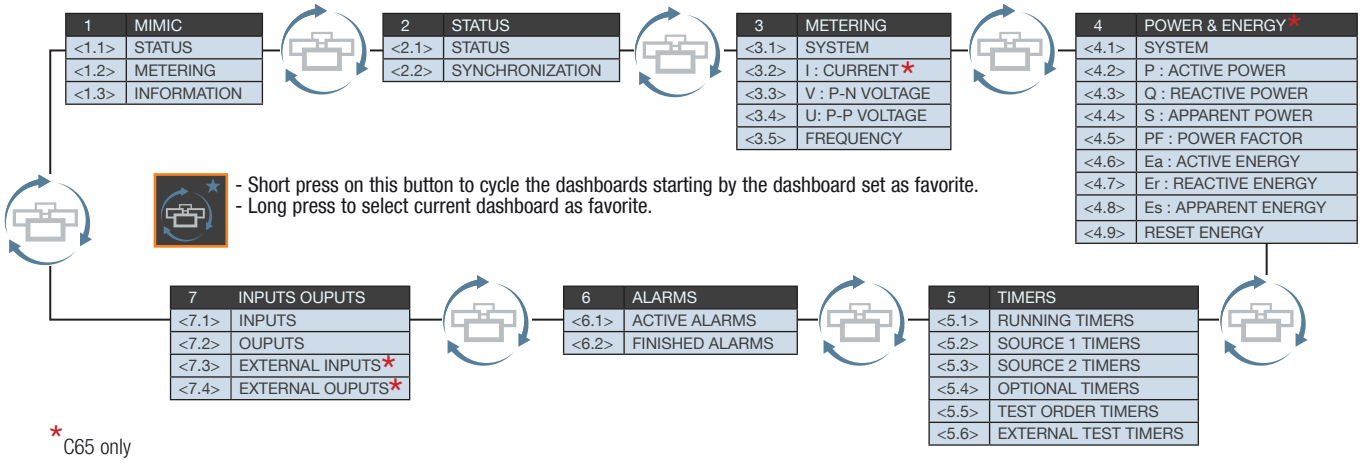



**Note** For a detailed configuration please consult chapter 11 (configuration).

# 9. VISUALISATION OPTIONS

### The visualisation DASHBOARDS

The controller has a direct access button to the visualisation 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

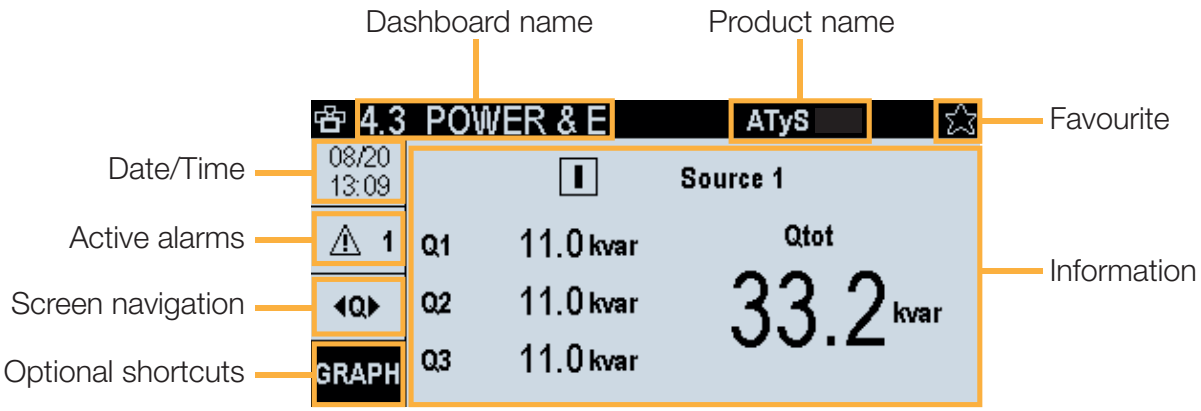



The dashboards can be visualized and screened through without the use of a password.

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 (only ATyS C65) the star in the top right hand corner will be shown filled: ★.

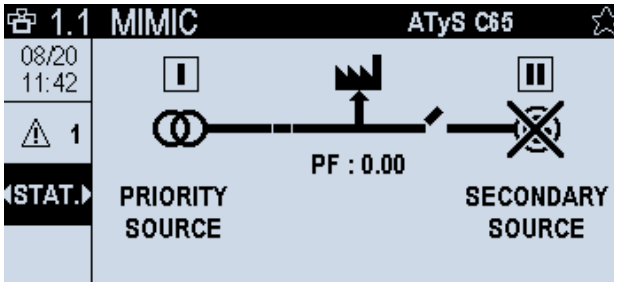
*This is available only for the screens of the dashboard menu

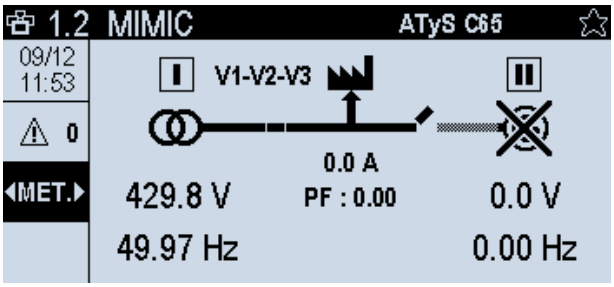
All the dashboards have the same display format as follows:




**Mimic :** 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:

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

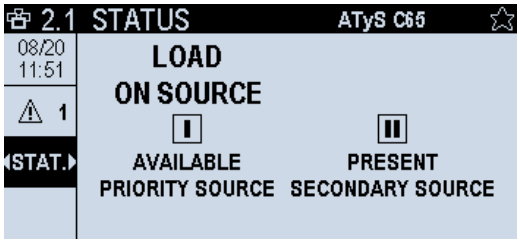


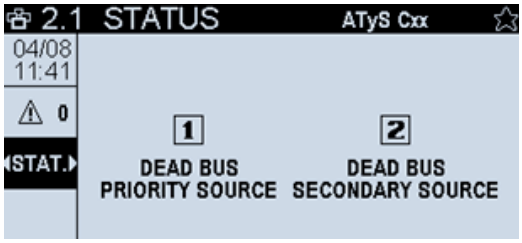



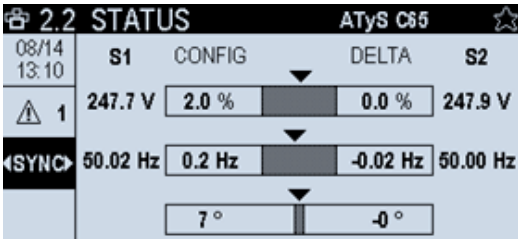

On the Summary display a mimic shows the status of the switch and the supply to the load. The sources will appear crossed if they are not available and not crossed if they are on. This information is also detailed in the status screen 2.1.

**Status :** Give more detailed information on the sources

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

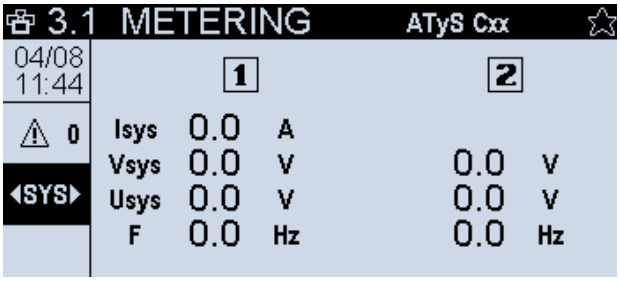


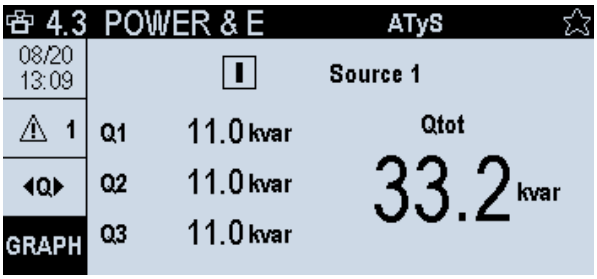

**Metering:** Allows the user to visualize detailed metering information on the load side.

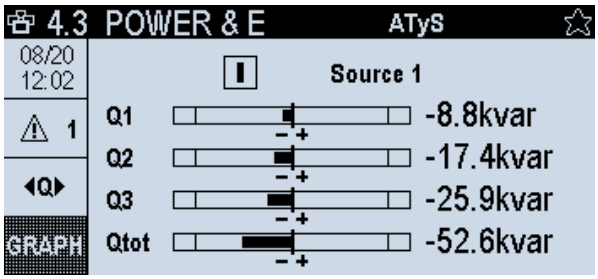
U: Phase –Phase voltage.
V: Phase-Neutral voltage.
F: Frequency.
SYS: Voltage, frequency and current of the system.
I: all currents measured (current sensors need to be connected to use this function).

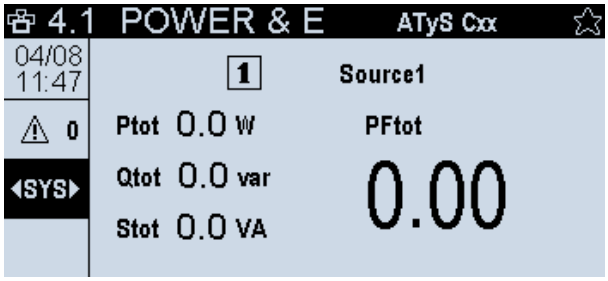


**P&E:** Allows the user to visualize the power and energy used by the load. (Current sensors must be used to enable this function). The information can be shown in numerical or both numerical and bar graph.

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.

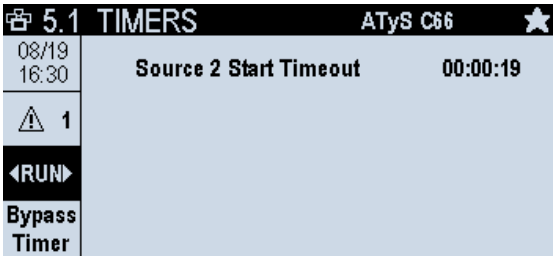



**Timers:** Allows the user to visualize the status of the timers.

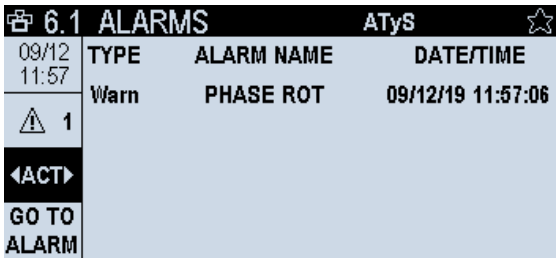
RUN: Shows all the ongoing timers, and allows the user to bypass the timers
S1: Shows all timers linked to source 1
S2: Shows all timers linked to source 2
OPT: Shows all optional timers




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

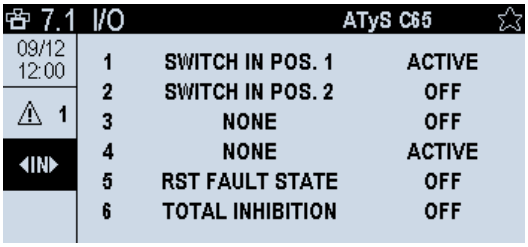
ACT: Shows all active alarms, and allows the user to direct access to the alarm menu.
FIN: Shows all finalized alarms that are not acknowledged by the user.

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.




**I/O:** Allows the user to visualize the configuration of the I/O. The settings for the inputs and outputs on the controller will be shown as well as the external I/O modules (if being used).

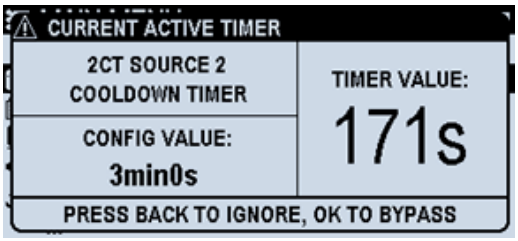
IN: Controller inputs.
OUT: Controller outputs.
E.IN: External inputs (IO10 modules).
E.OUT: External outputs (IO10 modules).



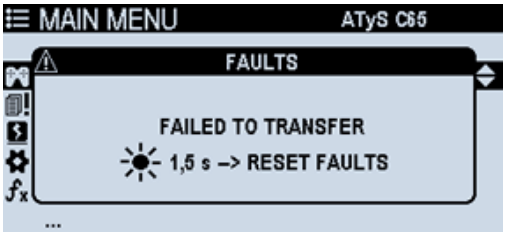

**The visualisation POP-UPS:**

The controller will inform the customer about the main real-time events through a pop-up. This pop-up can have 2 types of purpose:

- Timer running: timer pop-ups show the name of the timer active, the configured value and the countdown value with double font. This is a dynamic pop-up that gives 2 options to the user: 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)- Bypassing the timer will request a validation and an operator password.




- Validation / Action requested: different events can use this type of pop-up, such as fault clearing, confirmation to run a test, confirmation to change parameters, validation to bypass a timer,… Usually these type of pop-ups can be ignored by pressing the BACK button and some of them offer different options to the user.

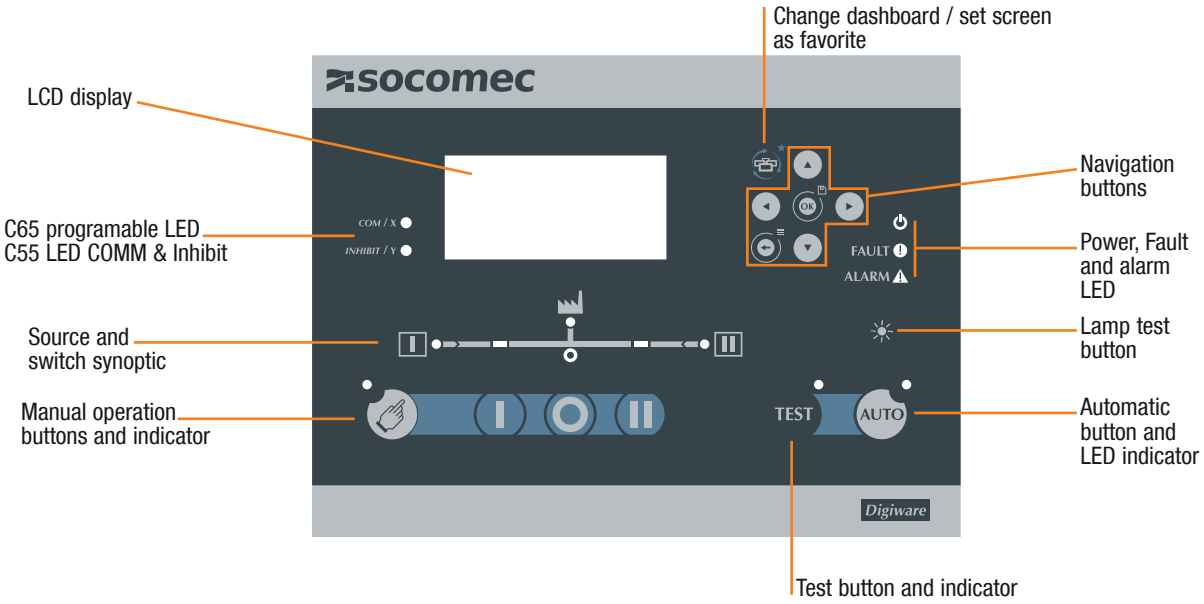


# 10. OPERATION AND CONTROL

## 10.1. HMI use

On the front face of the controller there are 14 keys/buttons that are used to configure, operate and visualize the ATS values anytime.

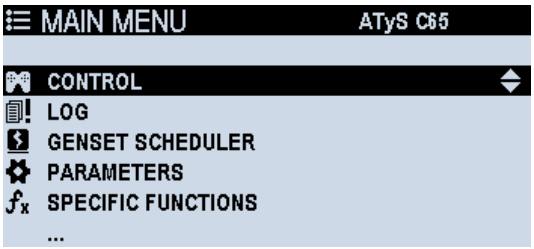
Summary of the HMI buttons




| 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. |
| I | Position I (source 1) manual order. Only in CTRL mode. |
| 0 | Position 0 (center-off) manual order. Only in CTRL mode. |
| II | 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 LED on screen<br>Long press: Clear faults pop-up (only if faults active) |
| Back/Menu | Press: back/return to previous screen or clear pop-up<br>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)<br>Long press: Sets the current dashboard screen as favourite |
| OK/Save & Quit | Press: Enter / OK / set a value / accept / confirm<br>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 ATSE and manage faults and alarms. (See chapter 10.8)

**GENSET SCHEDULER** – 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 ATSE can be set, as well as 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 to switch to source 1, to go to source 2 and to go to center off position (if existing).

**Note** In manual mode, if a source is lost, the genset (if any) will start but the controller will not force a transfer. The purpose is to keep the supply of the control and the communications.

**Automatic Operation:** in automatic mode the controller will take the control over the switching device according to the settings (operating range, timers, etc).

To switch from manual mode to Automatic mode, make sure there are no external inhibitions to 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).

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:

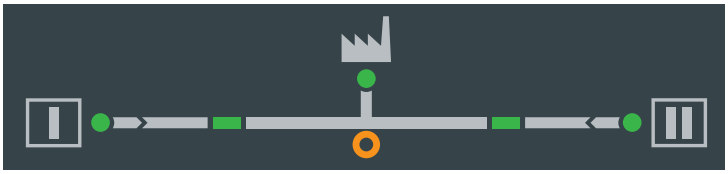
- Busbar dead
    - No voltage present on the source (all voltages below 50V).
- Source present
    - Voltage present (at least 1 phase above or equal to 50V) but availability conditions are not reached (see “Source available” below)
- Source available
    - To consider the source available:
       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

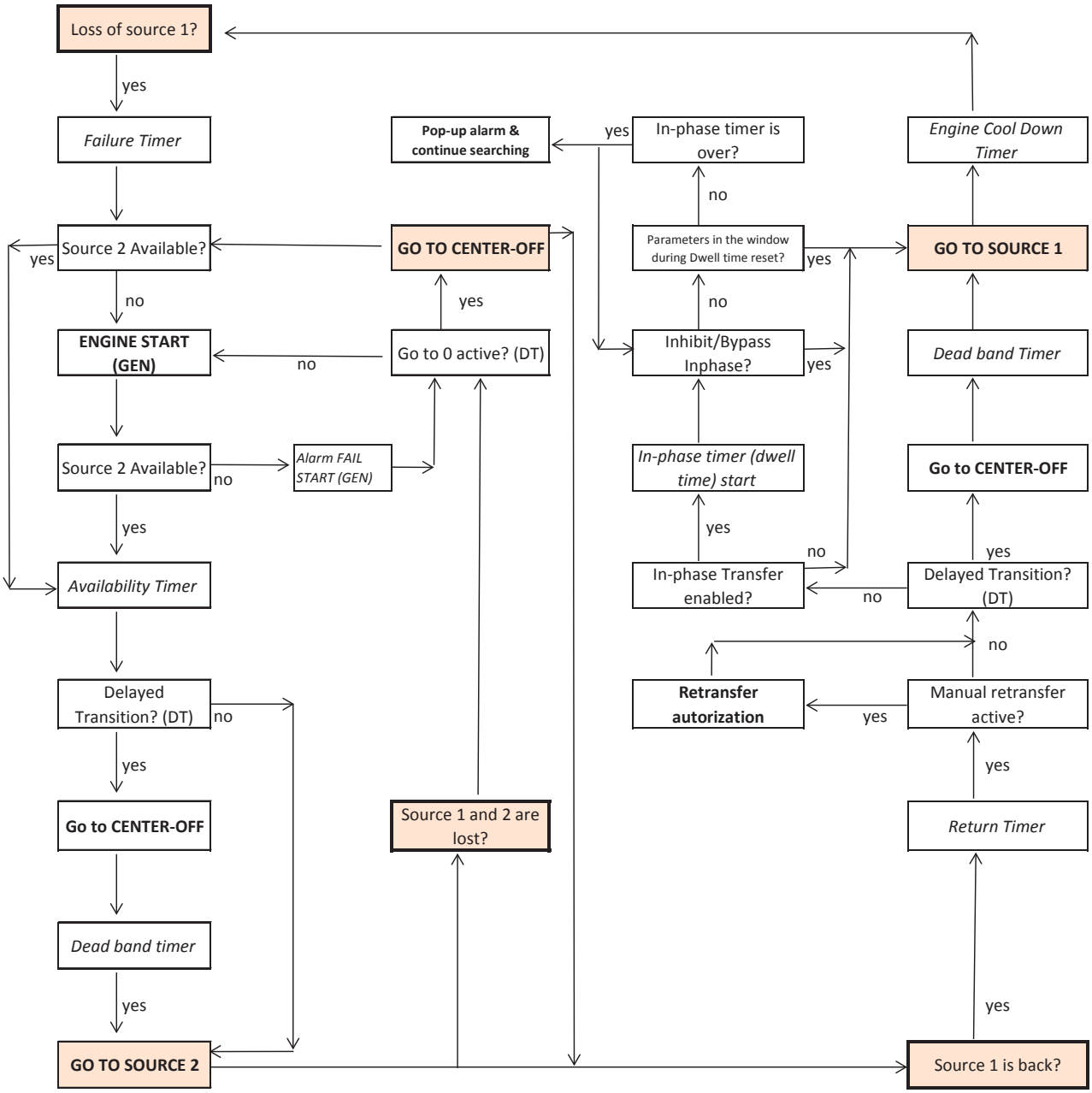
- If the LED is on, the load is supplied by either source 1 or source 2, which means that the source is available and the switch is in one of these positions.
- If the LED is blinking, the load is supplied but a load shedding is taking place.
- If the LED is off, the load is not supplied (switch not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

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

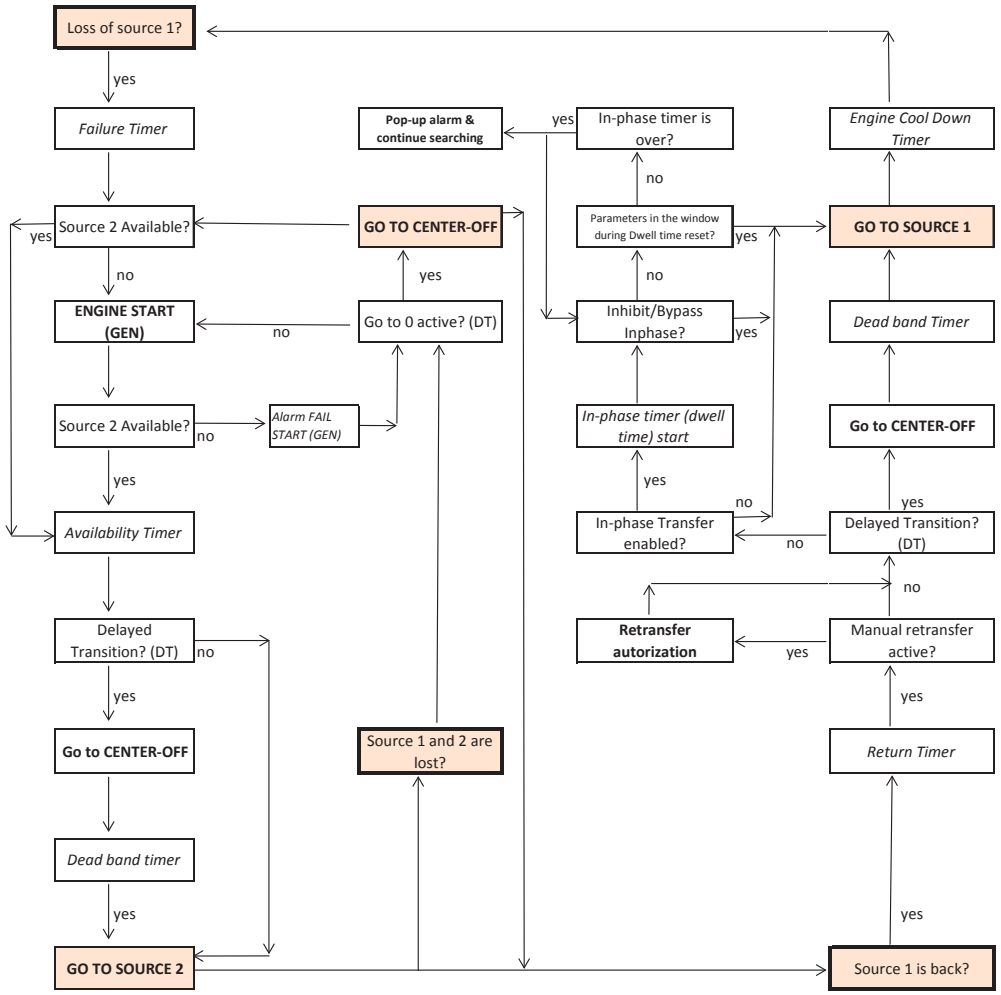
- If the LED is on, the switch is in center-off position  (only if there is a 0 poistion)
- If the LED is off, the switch position is either on S1, S2 or unknown (should always be off for technologies without 0 position)
- If the LED is blinking, the controller considers the switch is in that position,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

## 10.5. Automatism for Automatic mode (C65)

**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.

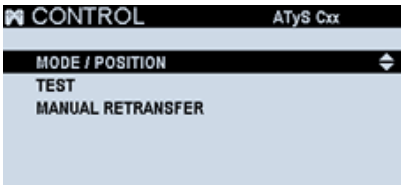
The duration of the tests can be limited (in the configuration) or can be set to Unlimited, when set to unlimited the user will have to press the test button again to stop the tests..

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.

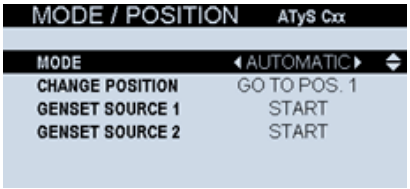
## 10.7. Control Menu

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: permits changing the operating mode, change position in CTRL mode and start/stop the gensets remotely (also in CTRL mode)
  - MODES:
    - AUTOMATIC: Standard automatic functioning of the controller
    - MANUAL / CTRL: Control of the switch manually using the controller to give orders to the switch. Buttons I-0-II are unblocked on the front face.
    - INHIBIT: Both CTRL and AUTO functions are inhibited until the mode changes. Message on the main dashboards (1.1 and 2.1) and buttons I-0-II, AUTO and CTRL will disable this mode but no remote orders will be taken into account.

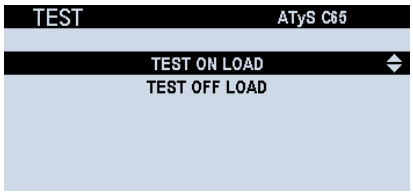
NOTE: For a total inhibition, the inhibition inputs have to be used.



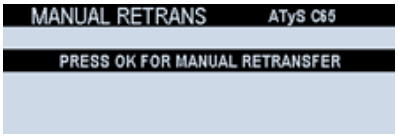

- CHANGE POSITION: (only in CTRL mode) permits sending orders to go to position 1, 0 (center-off) or 2 to the switch device.
- GENSET SOURCE 1/2: permits START or STOP the gensets installed as source 1 or 2.

**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 TEST ON LOAD or a TEST OFF LOAD. See previous chapter for further explanation.

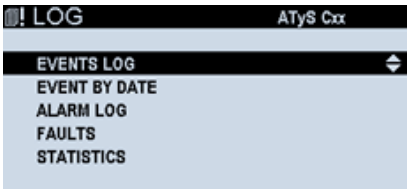



- MANUAL RETRANSFER: when “manual retransfer” option is selected in SPECIFIC FUNCTIONS / MANUAL RETRASNFER, the operator will need to validate the restransfer (directly on the HMI as shown below or using external inputs) the retransfer from alternate/secondary to priority/preferred/primary source by pressing OK and confirming in this screen.




## 10.8. Log Menu

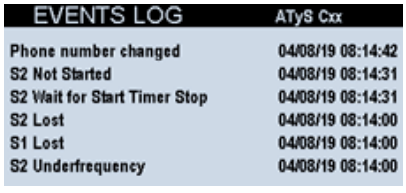
The LOG menu contains all the history/register/log of EVENTS (operations, timers, mode changes, configuration changes, product status, source availability..) ALARMS (user-selectable alerts) and FAULT (major alerts, not selectable by user, set by default). All the LOG menu elements are protected by the “operator” password (see chapter 11.1.8).

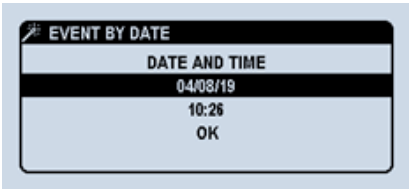



- EVENTS LOG: The controller C65 can store up to 3000 events while the C55 can store up to 300 events using FIFO to replace older events when the memory is full.

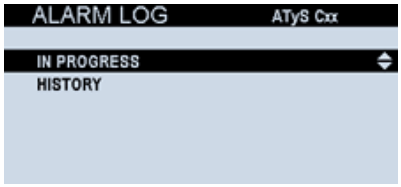
  The event log will show the information of virtually everything happening on the controller/ATS with timestamp and description. More information is available on the Webserver integrated on DIRIS Digiware M-70 gateway (detail of every event). To navigate through the event log, the UP and DOWN arrows can 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 functions is a search engine that permits to go directly to a selectable date and time and see the events that took place at that moment.



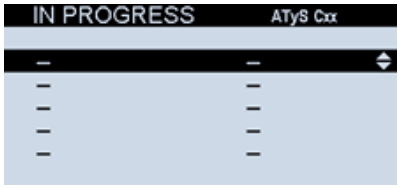
- ALARM LOG: the log can store up to 100 alarms or faults, even if they are in 2 different menus to make it simpler to the user. Inside alarm log screen, there are 2 options: in progress and history. “In progress” shows all active alarms and the history shows all the last finalized alarms.

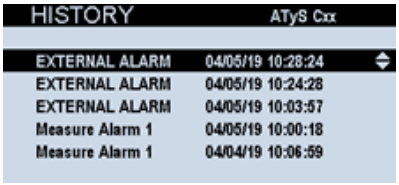



For each alarm, unlike with the events, the details are available, permitting the user to see:

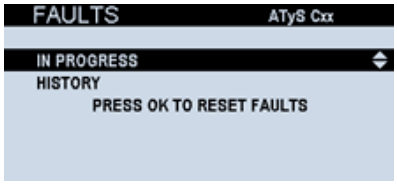
- Type of alarm
- Status
- Starting time and date
- Duration of the alarm active (counter running for active alarms)
- Criticallity of the alarm

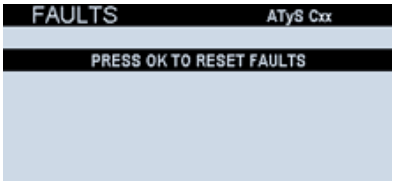
To learn about alarm configuration and options (see chapter 11.1.7).



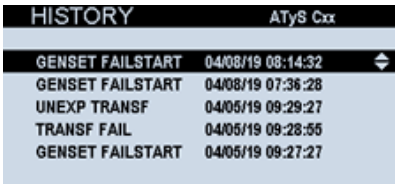




- FAULTS: 100 registers of faults and alarms can be stored inside the internal memory and they are divided into “in progress” and “history”. Faults, however, permit also reseting faults using the option “ PRESS OK TO RESET FAULTS” and confirming on the pop-up that appears on screen.

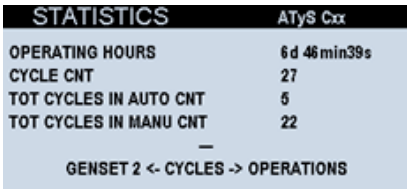



Faults, to the contrary of alarms, have no detail of each register. On the history log, the information is the fault description and the time & date when it occurred.

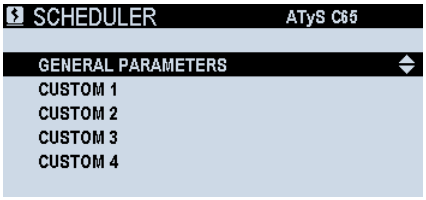


- STATISTICS: On this screen, user can see all the counters for:
  - Cycles (operating hours, number of cycles, cycles in manu, cycles in auto)
  - Operations (total and for each position)
  - Running hours (total and partial) (partial can be reseted by user)
  - Source 1 / Source 2 data (total time 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. Genset scheduler / 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" if both happen to occur at the same time. This is to avoid exercising a genset that it's being already exercised. Inside the GENERAL PARAMETERS menu in the same screen, it can also be set a "GENSET IDLE TIMEOUT" time in minutes to avoid exercising a genset that has just been active just a few minutes/hours before. By default this value is set to 168minutes but if is not desired, it can be configured to 0 to follow strictly the exerciser programs.




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

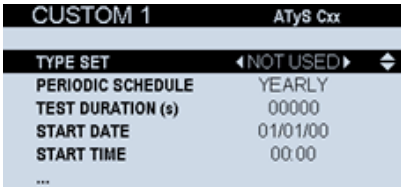
- **Type of test:** type of test that will be performed on this program
  - TEST ON LOAD / LOAD TEST: will perform a full test including all the timers and operating the switch (full cycle).

**Note** on all switches, a TEST ON LOAD will cause a load supply blackout when testing the transfer function.

  - TEST OFF LOAD / NO LOAD TEST: will perform a genset start for the defined time, and a genset stop after the time elapses.
  - Nothing / NOT USED
- **Periodicity:** 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:** that's 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:** that's 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)
- **Ending time&date:** that's the date&hour where the program will stop (for example, May 12th at 4pm) (after this date, this program will not execute a TEST).



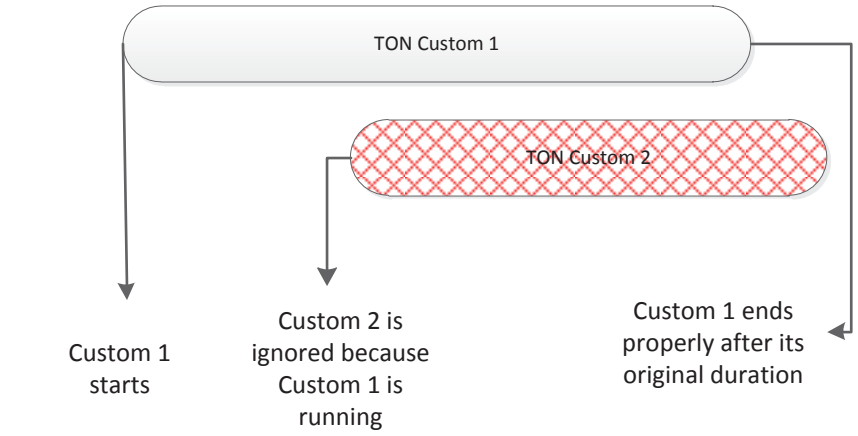

*Example:

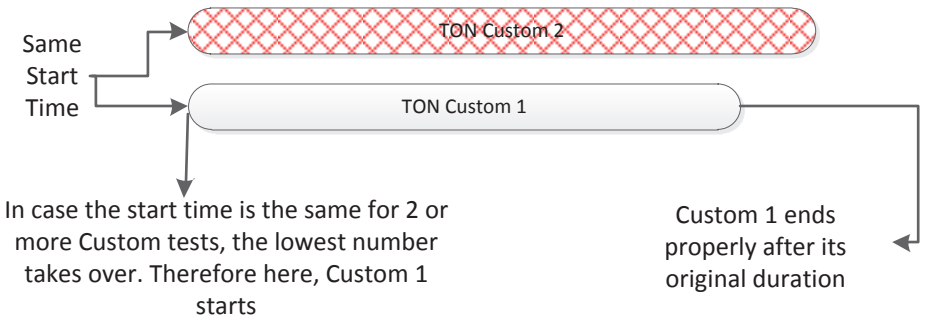
- Type: ON LOAD
- Periodicity: Monthly
- Test duration: 15min
- Starting time & date: January 5th at 1pm
- Ending time & date: May 12th at 4pm

The exerciser program will do the following:

Exerciser will carry on a full test on load (starting genset if any, counting timers and operating the switch and transferring loads 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 until May, when the last exerciser will take place on May 12th at 1pm). After May12th 4pm, the exerciser is over (ending date & time).

In the case of overlapping several exerciser/scheduler programs, the priority one (lower custom number) will take place and not the others. Examples:



# 11. CONFIGURATION

The configuration on the ATyS C55/65 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 be done even without cabling the AC or DC supply to the controller, only connecting it to a computer with an USB cable. 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

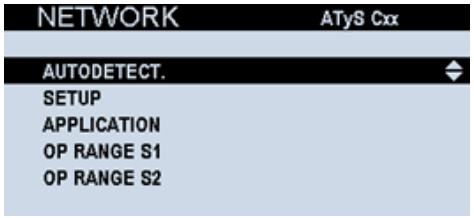
Inside the PARAMETERS menu of the Main Menu (accessible by entering the Configurator password, by default 1000) all the main parameters of the controller can be set:

| | |
|---|---|
| **NETWORK** | Permits the configuration of the nominal voltage and frequency, the phase rotation, the type of switch and the sources priorities, as well as the operating range where the controller will consider a source as available. See chapter 11.1.1. |
| **LOAD** | Permits adding the information about the nominal current and the transformers used to measure the current 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 (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. |
| **COMMUNICATIONS** | Permits the configuration of the communication parameters such as the Modbus address or the baudrate but also the use of the RJ45 outputs (Only on ATyS C65). 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 C65 and on the webserver (only available with M70 or D70 gateways). See chapter 11.1.7. |
| **PASSWORDS** | Permits changing the passwords for the different users. See chapter 11.1.8. |

**IMPORTANT NOTE** When doing the configuration through the display, don’t forget to put the controller in AUTO mode after the configuration is over to start the AUTOMATIC mode.

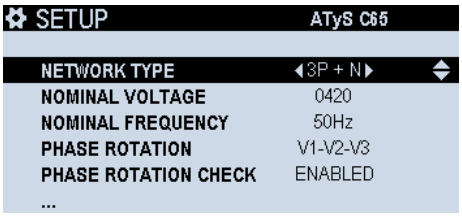
### 11.1.1. NETWORK parameters menu

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.

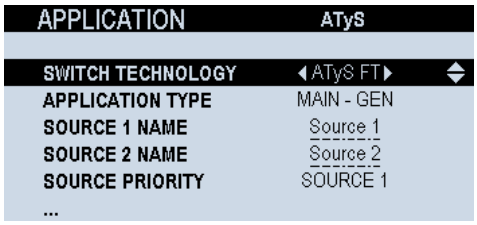
**SETUP** – Settings concerning the installation can be configured here:




- NETWORK TYPE: number of poles and wires. See detail on page "Types of network" inside this chapter
- NOMINAL VOLTAGE
- NOMINAL FREQUENCY
- PHASE ROTATION (ABC or ACB // V1 V2 V3 or V1 V3 V2)
- 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 switching device / RTSE. Options by default are:
  - ATyS r/d (remote / double supply) makes reference to any Socomec type ATyS r, ATyS d, ATyS dM, ATyS dH, ATyS S/Sd switches or equivalent motorized switch-based RTSE.
  - ATyS FT – (fast transfer) makes reference to Socomec's ATyS FT or equivalent Class PC 2 position (I-II) fast transfer (<50ms) switching device or equivalent. This technology permits using in-phase transfer (with C65)
  - ATyS DT – (delayed transfer) makes reference to Socomec's ATyS DT, dual operator Class PC with 3 position (I-center off-II) switching device or equivalent.
  - CIRCUIT BREAKER – (MCCB or ACB) makes reference to standard IEC 60947-2 circuit breakers with 2 positions per device (ON and OFF), offering the option to have 3 positions when used as a transfer switch (I-0-II).
  - CONTACTOR – (circuit contactor) makes reference to standard IEC 60947-4-1 contactors with 2 positions per device (ON and OFF), offering 3 positions (I-0-II). This technology forces the maintained logic for the position order outputs on the controller.

NOTE: To make configuration easier, the controller automatically changes 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
  - MAIN/MAIN or UTILITY/UTILITY when using 2 transformers as source 1 and 2.
  - MAIN/GENSET or UTILITY/GENSET when using a transformer and a genset as sources.
  - GENSET/GENSET when using 2 diesel generators / gensets as sources

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

- SOURCE PRIORITY: prioritary/preferred source can be set for source 1, source 2 or "no prioritary". In the "no prioritary" case, the switch will be closed on either one source or the other as long as they are available.

- LOGIC: according to the inputs of the switch to receive position orders, there are 2 types of logic:
  - IMPULSE / PULSE: the output from the controller will send a pulsed signal with a defined duration to the switch to change position.
  - CONTACT / MAINTAINED: the output from the controller will close and stay closed indefinitely as long as the switch is requested to stay in a position. This logic is used mainly with contactors but also with breakers and class PC switches that accept it. In that case, for example, if position 2 order is activated it will close the output until the transfer, when the output will be off to switch to center-off / position 0 and after go to position 1.

- TEST / EXT TEST ON LOAD PRIO (yes/no): with this option, when a TEST is taking place, it will stay in test position until it finishes (timers are elapsed) even if the source is lost.

**Note** If the test is set as Unlimited, the switch will stay in test position until the user finishes 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 (only 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 |
| ... | |

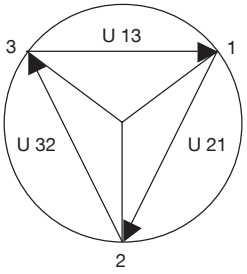
OV= overvoltage

UV= undervoltage

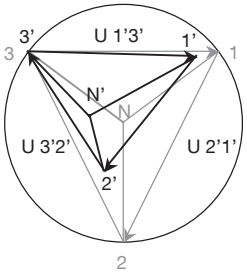
OF = overfrequency

UF = underfrequency

UB = unbalance



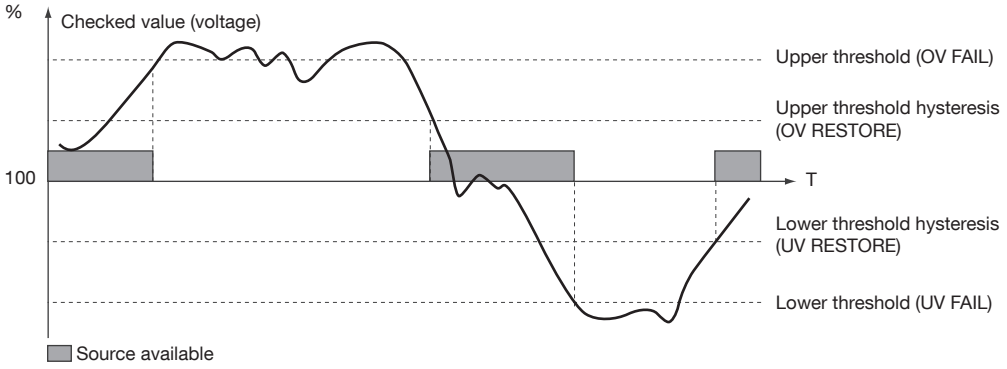

Balanced network




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".

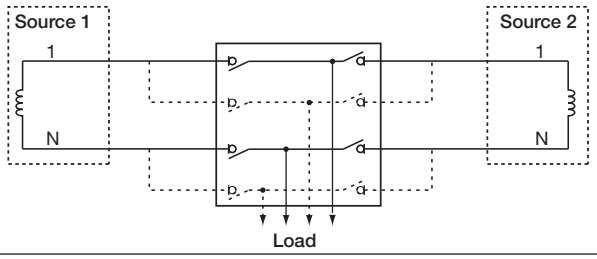
| | | DEFINITION | ** ADJUSTMENT RANGE |
|---|---|---|---|
| OV FAIL | 115% | Overvoltage threshold: Source Supply 1 | 102 – 130% |
| OV RESTORE | 110% | Over-voltage hysteresis: Supply 1 | 101 – 129% |
| UV FAIL | 085% | Undervoltage threshold: Supply 1 | 60 – 98% |
| UV RESTORE | 095% | Undervoltage hysteresis: Supply 1 | 61 – 99% |
| UB FAIL | 000% | Phase unbalance threshold: Supply 1<br>Refer to next paragragh for further details | 0 – 30% |
| UB RESTORE | 000% | Hysteresis unbalance threshold: Supply 1<br>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:

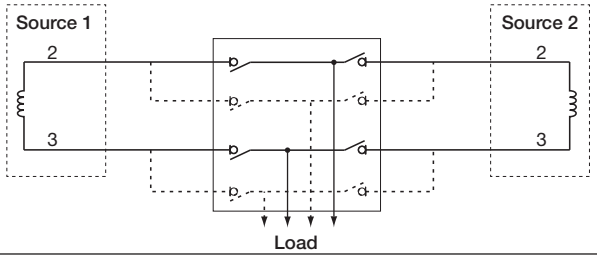
- As a % of U nominal for Over and Undervoltage
- As a % of U avg in case of unbalances.
- As a % of nominal frequency

## Types of Network

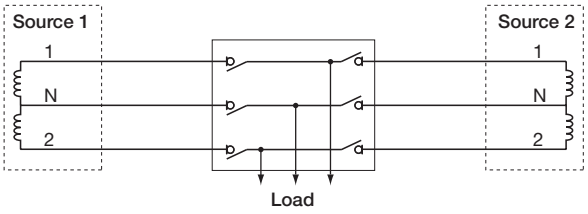
**1P+N** Single phase network



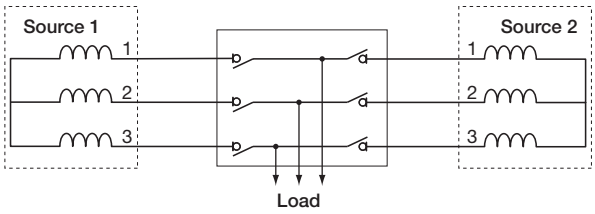

**2P** Two phase network without neutral



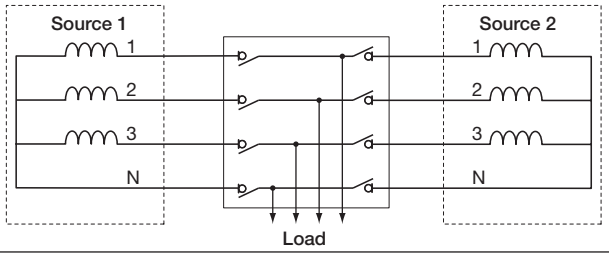

**2P+N** Two phase network with neutral



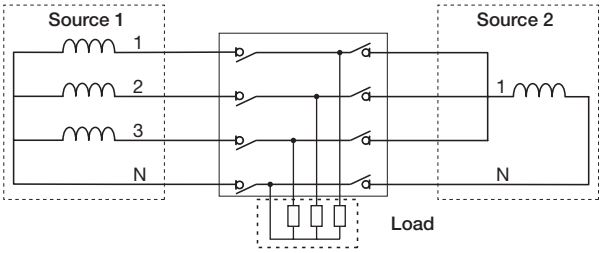

**3P** Three phase network without neutral



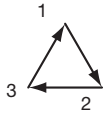
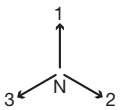
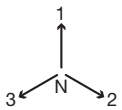
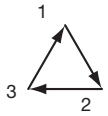
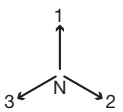
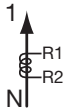
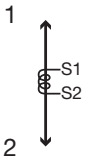
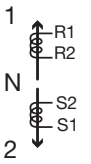
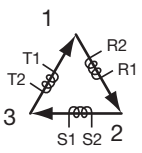
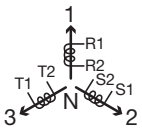
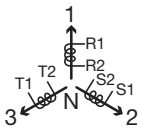

**3P+N** Three phase network with neutral




**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 | -<br>V1 | 12 | U12<br>V1, V2 | U12, U23, U31 | U12, U23, U31<br>V1, V2, V3 | U12, U23, U31<br>V1, V2, V3 |
| Source 2 | -<br>V1 | 12<br>- | U12<br>V1, V2 | U12, U23, U31<br>- | U12, U23, U31<br>V1, V2, V3 | -<br>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 APPLICABLE TO ATYS C65** | | | | | | |
| Source 1 | -<br>V1<br>f1 | U23<br>-<br>f1 | U12<br>V1, V2<br>f1 | U12, U23, U31<br>-<br>f1 | U12, U23, U31<br>V1, V2, V3<br>f1 | U12, U23, U31<br>V1, V2, V3<br>f1 |
| Source 2 | -<br>V1<br>f2 | U23<br>-<br>f2 | U12<br>V1, V2<br>f2 | U12, U23, U31<br>-<br>f2 | U12, U23, U31<br>V1, V2, V3<br>f2 | -<br>V1<br>f2 |
| If CT connected (load side) | -<br>-<br>-<br>$P_T$, $Q_T$, $S_T$, $PF_T$ | -<br>-<br>-<br>$P_T$, $Q_T$, $S_T$, $PF_T$ | P1, Q1, S1, PF1<br>P2, Q2, S2, PF2<br>-<br>$P_T$, $Q_T$, $S_T$, $PF_T$<br>I1, I2 | P1, Q1, S1, PF1<br>P2, Q2, S2, PF2<br>P3, Q3, S3, PF3<br>$P_T$, $Q_T$, $S_T$, $PF_T$<br>I1, I2, I3, In | P1, Q1, S1, PF1<br>P2, Q2, S2, PF2<br>P3, Q3, S3, PF3<br>$P_T$, $Q_T$, $S_T$, $PF_T$<br>I1, I2, I3, In | P1, Q1, S1, PF1*<br>P2, Q2, S2, PF2<br>P3, Q3, S3, PF3<br>$P_T$, $Q_T$, $S_T$, $PF_T$<br>I1, I2, I3, In |

### 11.1.2. LOAD parameters menu (only C65)

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:

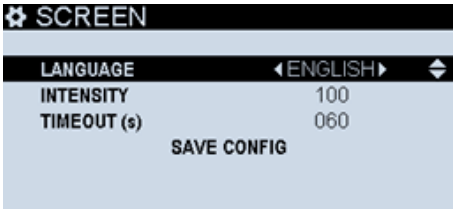
| NETWORK TYPE | LOAD TYPE | POSITION OF CT'S | NOTES |
|---|---|---|---|
| 1P+N | 1P+N_1 CT | On L1 | Standard solution. Calculated neutral. |
| 2P | 2P_1 CT | On L1 | Standard solution. |
| 2P+N | 2P+N_2 CT | On L1 and L2 | Standard solution. Calculated neutral. |
| 3P | 3P_3 CT | On L1, L2 and L3 | 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:

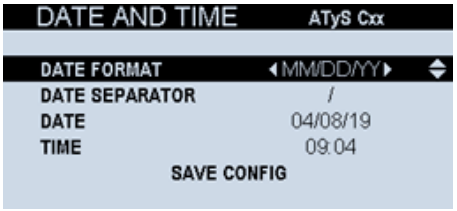



Languages available:

- English
- French
- Spanish
- Italian
- Chinese
- Turkish
- Portuguese
- German
- Polish

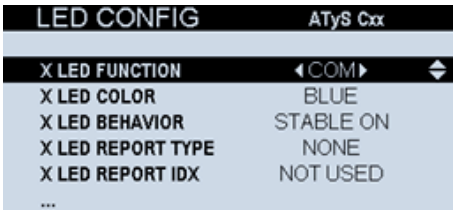
“Timeout” sets the time in seconds where the screen will remain on after touching a button.

- DATE AND TIME PARAMETERS:



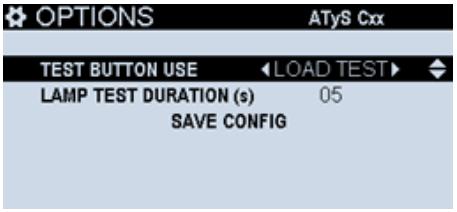

Date and time will remain running thanks to the RTC battery even if all sources are off.

- CUSTOMIZABLE LED (X & Y) PARAMETERS (Only on C65 / C66):




- 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.

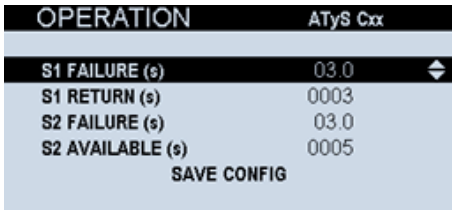
- CHANGE PRODUCT NAME: allows changing the name of the ATS. This information will appear on all the dashboards and menus on the top-right of the screen.

### 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.

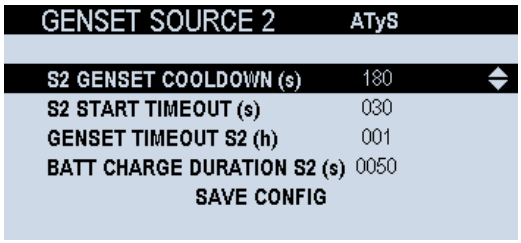
- Operation timers (6 timers)




- 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.

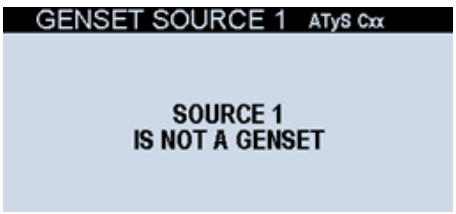
**Note** By default, S1 and S2 DEAD BAND are the same and set to 3s. On C55 there is no differentiation between S1 or S2. For ATyS FT technology (I-II switch, with no 0 position), DBT timer does not exist.

- 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).



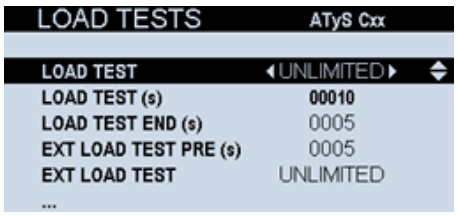

- GENSET COOLDOWN (s): once transferred back and genset is running without load, time to wait until the signal to turn off the genset is sent. This permits the genset to cool down after utilisation
- START TIMEOUT (s): time to wait for the genset to start. After this time, a fault will pop-up saying "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.

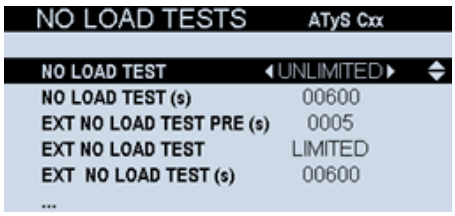
NOTE: If the source is not linked to a genset the following message will be shown:



- 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).



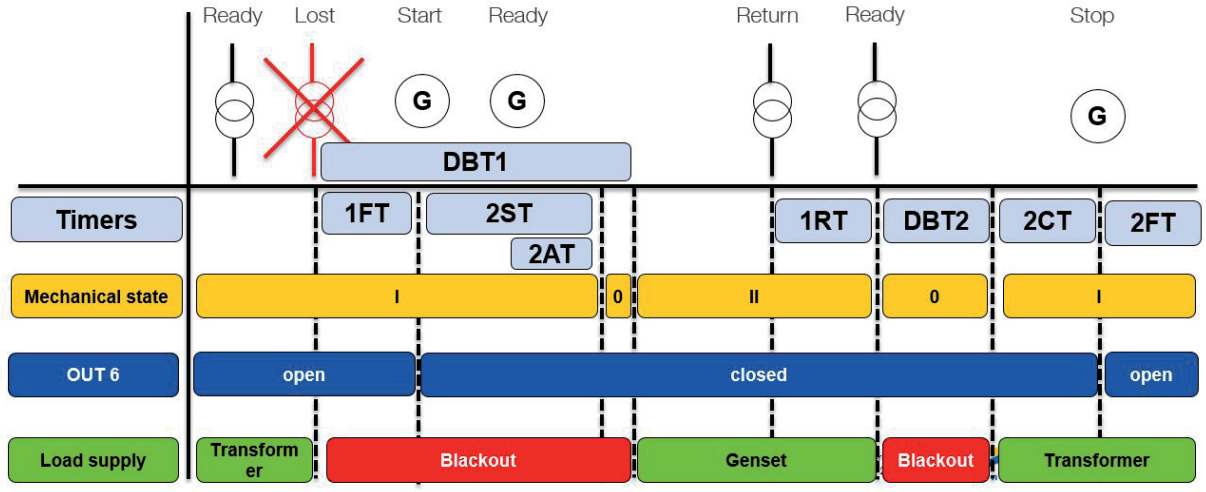




- TEST(s): duration of the test
- TEST ON LOAD END (s): after a test on load (not external), time to wait in secondary source before going back to prioritary source
- EXT. TEST ON/OFF LOAD PRE (s): pre-timer before starting transfer to secondary source on an external test.
- EXT. TEST ON/OFF LOAD POST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

- Network Main-Genset, priority on Network (Transformer)

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




LEGEND:

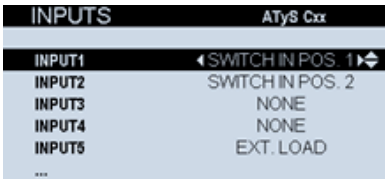
- 1FT = Failure timer S1
- 2ST= Genset start timeout timer
- 2AT= Availability timer S2
- DBT1= Dead band timer S1
- 1RT= Source 1 return timer
- ELD = Elevator delay & ELR = Elevator restore
- DBT2= Dead band timer S2
- 2CT= Cooldown timer genset S2
- 2FT= Source 2 failure/disconnection timer

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

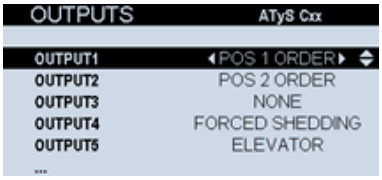
### 11.1.5. I/O parameters menu

All the I/O can be set on this menu. By default, the controller has 6 inputs and 6 outputs on the controller (called internal Inputs / Outputs) and up to 6 modules with 4in/2out can be added (only C65 and C66) achieving up to 30 inputs and 18 outputs total. The I/O menu has the following submenus:

- INPUTS: permits configuring the 6 internal inputs

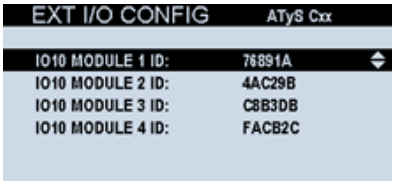


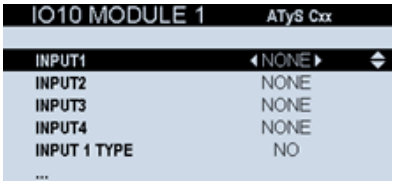

- OUTPUTS: permits configuring the 6 internal outputs




- 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



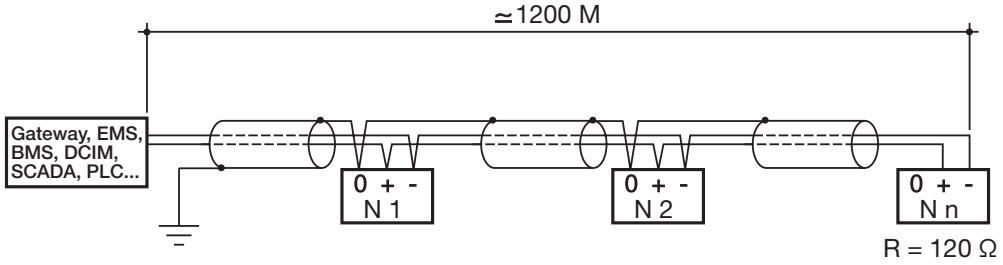

NOTE: The specific functions that are related to the I/O might require some settings to be configured on the SPECIFIC FUNCTIONS menu. Consult the I/O Annexes in chapters 13.3 and 13.4 to have the full list of functions to be configured on the I/O

## 11.1.6. COMMUNICATION parameters menu

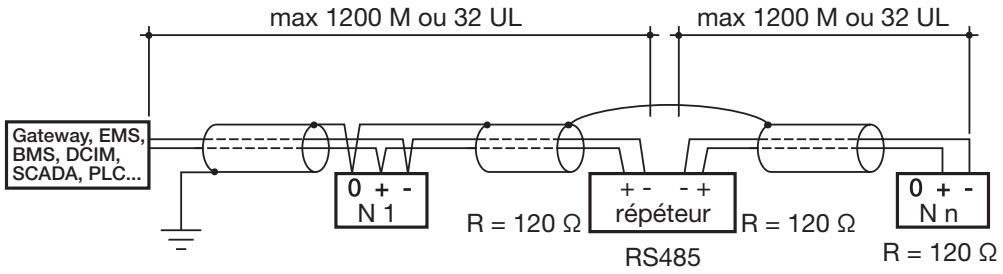
### RS485

The MODBUS RTU protocol available on the ATyS C55/C65 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.

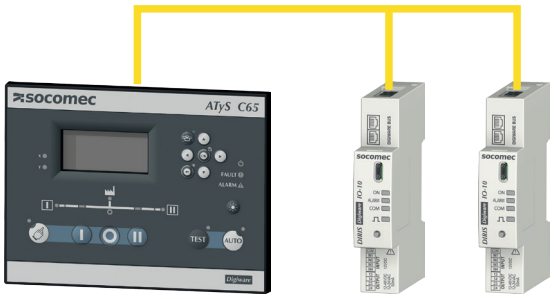



Communication tables: can be found on the website at the following address:
www.socomec.com

## Digiware

The product offers the option to choose between controlling external I/O 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.



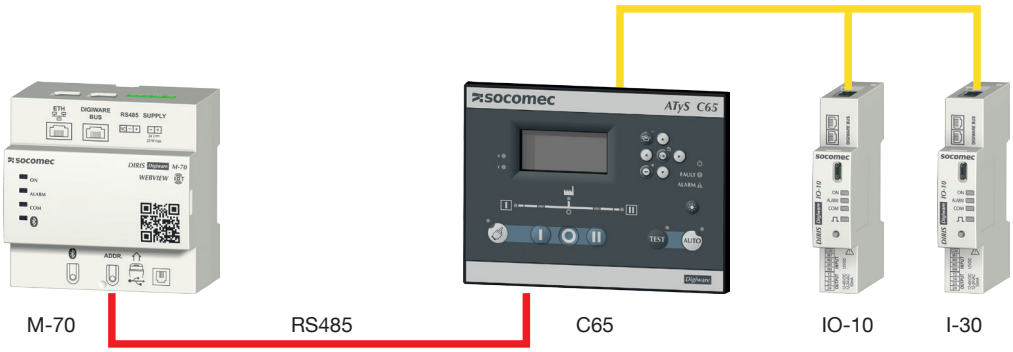

Controller as a slave, part of a Digiware chain, working as a U10 module that sends the voltage sensing information into the chain to be read by other measurement modules.

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

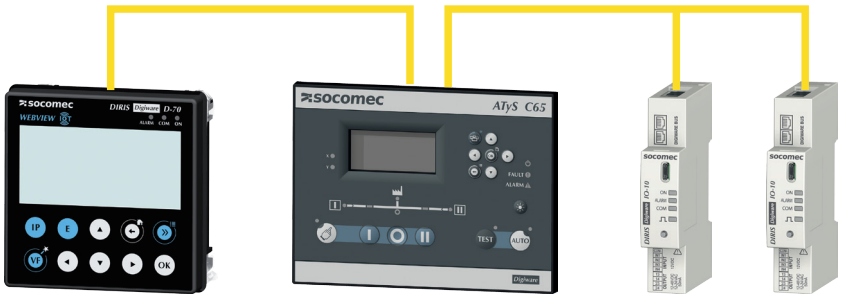
**Note** It's not possible to be at the same time master over IO and slave in the Digiware chain.

## Ethernet

For the ATyS C55/65 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 CXX can be connected by RS485 or with the Digibus.

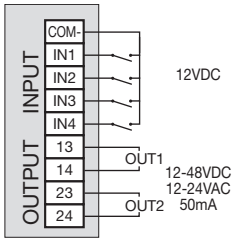



Using Diris D70 gateway.

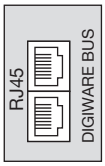
**Note** When the controller is part of a Digiware chain, it's not possible to use the external I/O modules in direct connection with the controller.

### 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:

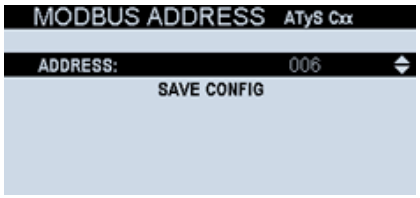
Once the controller is powered up, the modules will receive power supply and by changing the settings:

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.

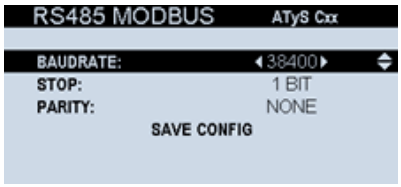
**Communications Menu:**

The ATyS C55 and C65 have 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.

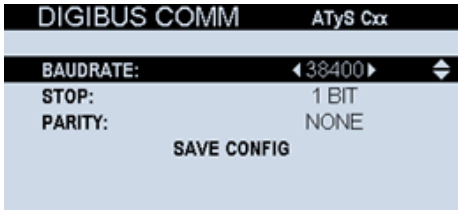



- RS485 MODBUS: All Modbus parameters can be set here:

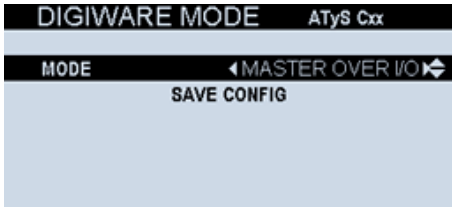



  - BAUDRATE (1200-2400-4800-9600-19200-38400-57600-115200) By default 38400.
  - STOP: (1BIT – 2BITS) By default 1 BIT
  - PARITY: (ODD-EVEN-NONE) By default none

- DIGIBUS COMM: The same parameters than for RS485 can be set also for the Digibus connection (RJ45 inputs on ATyS C65) when integrated in a DIRIS Digiware system.

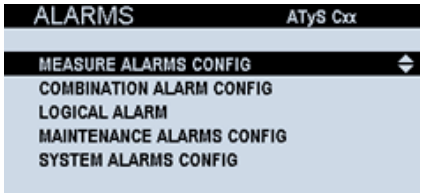


- DIGIWARE MODE: to be able to use the controller inside a Digiware chain, it's needed to change the parameter MODE to SLAVE. To be able to use external I/O modules the function of the RJ45 has to be switched to "MASTER OVER I/O" changing the MODE parameter:




### 11.1.7. ALARMS parameters menu

The ALARMS are different from the FAULTS on the ATS Controller. The Alarms are user configurable while the faults are internal to the product and can't be disabled. Everything that is critical for the application is set as Fault (chapter 12, 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, it can be set a threshold, an acknowledgement method, an output type, an output report and a criticality.

**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**: Acknowleging 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 acknloedged when the user has understood and take action according to the alarm triggered. Chaging the acknowledgment method will alows the user to acknoledge either through : diplay, communication, or using the inputs.

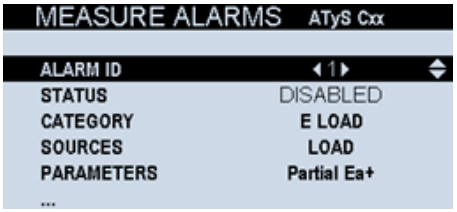
**Output type**: the alarms can be associated to an output that will become active while the alarm is active too. The output used can be chosen between the internal and the external outputs (extension modules).

**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 the alarms set as CRITICAL.

There are different types of alarms on ATyS Cxx:

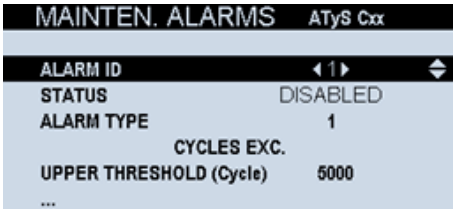
**MEASURE ALARMS CONFIG** – (Only on C65) Permits configuring up to 4 alarms related to metering parameters.




- 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).

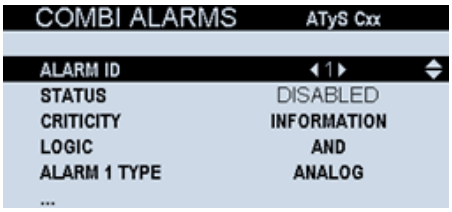
**MAINTENANCE ALARMS CONFIG** – Allows the service (maintenance password required) to set up to 6 alarms of different or the same type.



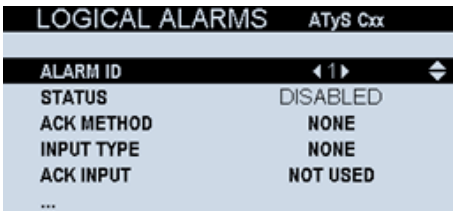

- Cycles Exceeded: maximum number of operation cycles of the switch reached. A cycle considers going from one position to the opposite on and come back (for example I-II-I or I-off-II-off-I). By default it is set to 5000 cycles.
- Operations Exceeded: maximum number of operations (change of position, including the off positon (if existing) of the switching device. By default it is set to 10000.
- Genset runtime S1 or S2: total amount of time that the genset has been working (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. Socomec recommends 12 months after servicing.

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

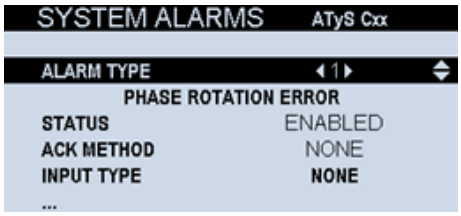
**COMBINATION ALARMS CONFIG** – (Only on C65) Permits up to 4 boolean combination alarms (using OR / AND) on the defined alarms (logical, measurement, maintenance). This can be done by using the INDEX of each one of the 2 alarms to combine.




**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 loses the ability to perform the transfer functions 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 if 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

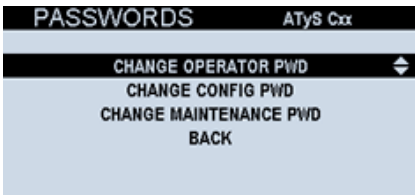
The controller considers there are 4 levels of user who can use it, so it uses 4 level of security:

- Standard user – it requires no password and it permits the visualization of the parameters and values measured by the controller. It is the level by default and if another user stays away from the controller for more than 5 minutes with no actions, the security level will become Standard user automatically.
- Operator - it requires the Operator password (by default 4000, can be changed in the Configurator level inside Parameters). It allows changing the operating mode, sending position orders to the switch and setting the engine exerciser parameters and alarms.
- Configurator – it requires the Configurator password (by default 1000, can be changed). It allows to change any configuration of the controller (operating range, timers, type of control, display settings, etc)
- Maintenance – It's the highest level of security. It requires the maintenance password (by default 1010) and it permits 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 (Configurator or Maintenance access).




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

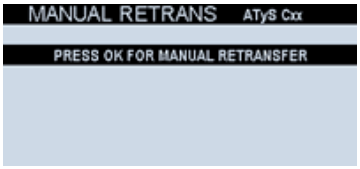
## 11.1.9. SPECIFIC FUNCTIONS Menu

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

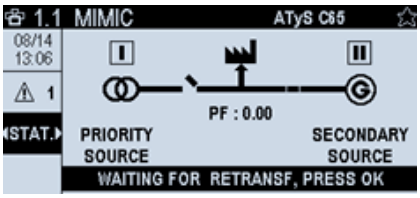
**Manual retransfer**

If this function is active (“YES”), when loads are supplied from the emergency source, the controller will not come back to the normal source when this one comes back until a confirmation order is received through the display or through an input (configured to do so). This applies also to TEST ON LOAD requests, a manual retransfer will be required to go back to the prioritary source.

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




If the dashboard key is pressed on the keypad while manual retransfer is needed, there will be a bottom message line on screens 1.2 and 2.1 remembering the user that the retransfer approval is required.



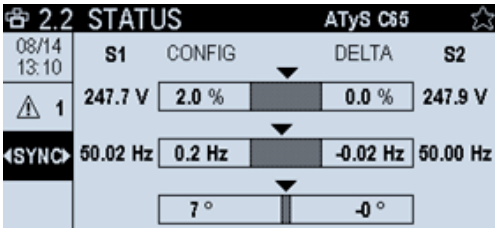

**In-phase transfer (Available in C65)**

The in-phase transfer is available for ATyS FT typology of RTSE or equivalent (2 position switch Class PC, I-II). It allows the phase monitoring of the 2 sources, 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:

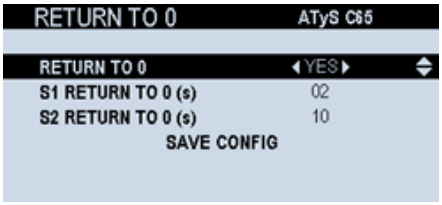
- Voltage range
- Frequency range
- Angle
- Phase rotation
- Dwell time
- In-phase time

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



**Return to 0 (only C65)**

This function allows the switch to go to center-off position (only typologies with 0 or center-off position) when both sources are lost or not available (supply to the load is not good enough due to undervoltage, phase lost, overvoltage, frequency out of limits,…). It can be used to avoid providing bad quality energy to the loads but also to avoid the power ramp and transients that may occur before the source is stable to go to the loads, as some loads might be sensitive to these events.




Associated timer to configure:

- RETURN TO 0 (s) (independent for S1 and for S2): time to wait before going to center-off / zero position after losing a source. (starts counting at same time than 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).

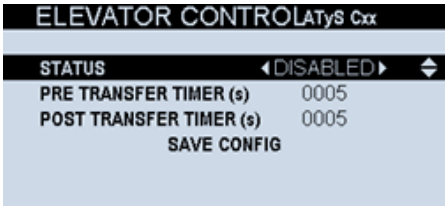
If the typology of the switch (technology) doesn't allow the function, a message will pop up as follows:

**Lift / Elevator Control (Available in C65)**

The elevator 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 will then send the elevator to the next floor and open its doors to avoid having people trapped inside the elevator while the transfer takes place and avoid panicking.

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).

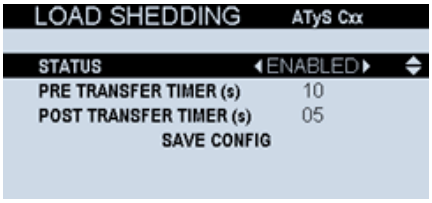
To be able to use the elevator signal function, it is required to configure an output as ELV – Elevator output in the PARAMETERS / I/O / I/O CONFIG menu.



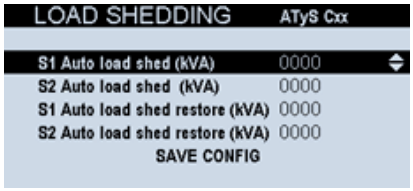
**Load shedding (Available in C65)**

ATyS C65 counts with 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 and when this limit is exceeded the controller can perform an automatic load shedding in the same way than in the forced load shedding by activating an output (has to be configured as PTS - Power Threshold Exceeded / Smart Shedding) that 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 before with the difference that if the load required power is variable in some cases it might not be necessary to shed the loads when transferring to the secondary source and the controller will automatically detect the power level and decide if to shed loads or not intelligently.




Note: for Smart load shedding 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 start in automatic mode every time the controller recovers power after a loss of supply on the ATyS C65.

**DBT Timer in CTRL (Available in C65)**

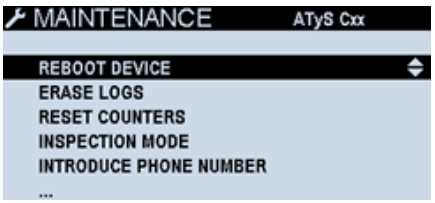
In CONTROL mode (manually operating the switch through the controller buttons or via communications), this function will force the controller to take into account the “time in 0 position/center-off” when transferring from one source to the other.

**HVAC compressor**

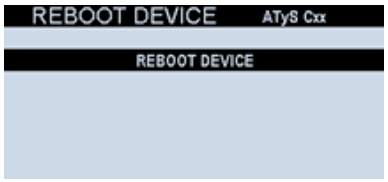
This is a specific function designed to preserve the lifetime of the compressors inside HVAC units. When going back to principal source position the contact will become active prior to starting the transfer (to shut down the compressor), then the transfer will take place and then after reaching the opposite source, a configurable timer will elapse before deactivating this output again. It avoids stressing the compressors in HVAC chillers.

## 11.1.10. Maintenance Menu

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

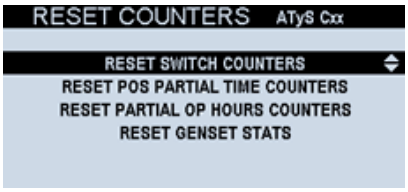



- Reboot device: permits a software reboot on the controller without erasing any information.
  A confirmation request will pop up when pressing OK on the function.



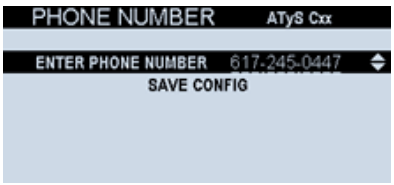

- Erase Logs: erases the event log or the alarm log. A second confirmation will be required.

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

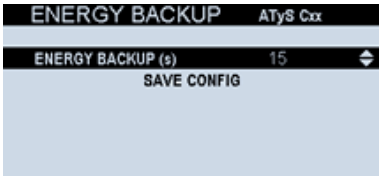



- Inspection Mode: after servicing the product, this menu can be used to add the last inspection date/time.
  This information can be consulted on the main menu / ABOUT section by all the users.

- Introduce phone number: a phone number can be introduced to appear on the ABOUT screen as the maintenance phone number, so in case there is an urgency, the operator in front of the controller can quickly check the phone number to make a call to the person in charge / supplier.

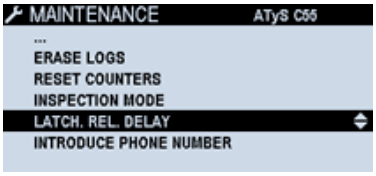


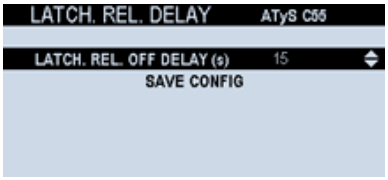
- Energy Backup (only on C65): the energy backup time can be set from 0 to 30 seconds. By default it is set to 15 seconds and it can preserve this time even after 8 years of use of the product.




**Note** The emergency/powerfail genset start (closing the latching relay) will only act after the backup time is elapsed.

- Latching relay OFF Delay (only on C55): C55 has no energy backup. However, there is a function to delay the closing of the latching relays (OUT 5 & 6) after a few seconds from the loss of supply. This value ( in seconds) can be configured in this maintenance menu.




Inside the parameters there are alarms reserved for services (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:

- Cycles Exceeded: maximum number of operation cycles of the switch reached. A cycle considers going from one position to the opposite on and come back (for example I-II-I or I-off-II-off-I). By default it is set to 5000 cycles.
- Operations Exceeded: maximum number of operations (change of position, including the off positon (if existing) of the switching device. By default it is set to 10000.
- Genset runtime S1 or S2: total amount of time that the genset has been working (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 permits to fully configure the ATyS C55/C65 and other Socomec products with a very intuitive interface and that permits also preparing configurations when not connected to the product, save preset configurations and loading them to the controller(s) when being in front of the product. This is very useful when many controllers have to be configured with (almost) the same 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 parameters.

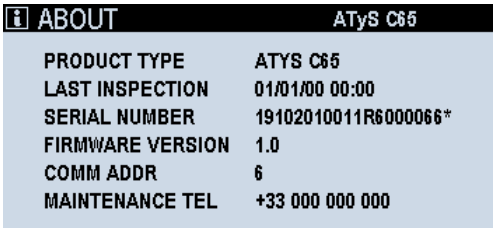
You can download EasyConfig for free from the following link:
https://www.socomec.com/easy-config-software_en.html

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 C55 / ATyS C65 )
- 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 might be asked 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 authorised 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 to integrate inside the ABOUT menu a phone number by the user related to the maintenance of the product (for example, Socomec’s contact number or the maintenance manager in contact with the service team number).

Product references:

| Part Number | Image | Description |
|---|---|---|
| **1600 0055** | | ATyS C55<br>ATS Controller with mid-level functionalities |
| **1600 0065** | | ATyS C65<br>ATS Controller with advanced functionalities |

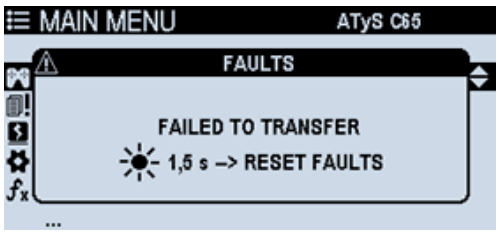
## 12.2. Faults management and Troubleshooting

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

For faults with pop-up, the pop-up will be cleared when fault will be cleared or by pressing any button on the front face of the controller. The total number of faults logged on the controller is dynamic, as the total number of “faults + alarms” is 100 (not including the events, which are 3000 on C65 and 300 on C55) and uses a FIFO ordering.

To clear Faults through the display, it is possible inside 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. I the faults are not active any more, they will be logged in the “history” log. This way to clear 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 C55/C65 controller is conceived to be a maintenance free, fit and forget unit. 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 + RTSE) every year.

There are no serviceable parts in the controller. In case of a malfunction, don't hesitate to contact Socomec and/or return the product for a replacement in case warranty is still valid. During conversations with Socomec, you might be asked for the model, firmware version or the serial number of the unit. This information can be found inside the ABOUT menu. If the controller screen is not functional, then use the labels and QR code on the back side of the controller to inform our service team.

**RTC Battery replacement**

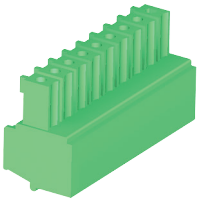
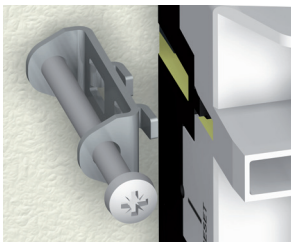
Depending on the working and environmental conditions conditions the battery will need to be replaced when the controller displays a message "RTC Low Battery". Should the time & date at power up be incorrect it will be time to replace the battery.

To do so:

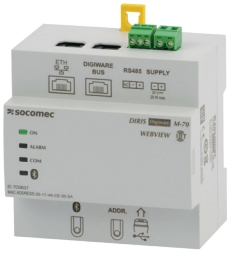
1. Disconnect all terminals from the controller
2. Release the cover on the side of the controller containing the battery
3. Remove the old battery with an apropiate plastic tool
4. Place the new battery on the correct side (polarity) in the holder from the pcb and push with the finger until it reaches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

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

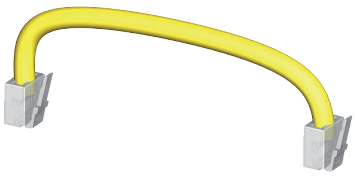
## 12.4. SPARE PARTS

| Part Number | Image | Description |
|---|---|---|
| **1609 0001** | | IP65 silicon sealing gasket for door mounting in outdoors |
| **1609 0002** |  | Connector kit (including ATyS C55/65 but also ATyS FT/ DT connectors that can be thrown away when using other technologies) |
| **1609 0004** |  | Controller mounting screws / Fixing clips (for door mounting) (kit of 4 units) |
| **1609 0005** | | Controller mounting feet (for back plate mounting) (kit of 4 units) |

## 12.5. ACCESSORIES AND EXPANSION MODULES

| Part Number | Image | Description |
|---|---|---|
| **4829 0140** | | DIRIS Digiware IO-10 for ATyS C65<br><br>4 Digital inputs + 2 Digital outputs expansion module<br><br>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 | Current Transformers for ATyS C65 | |

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

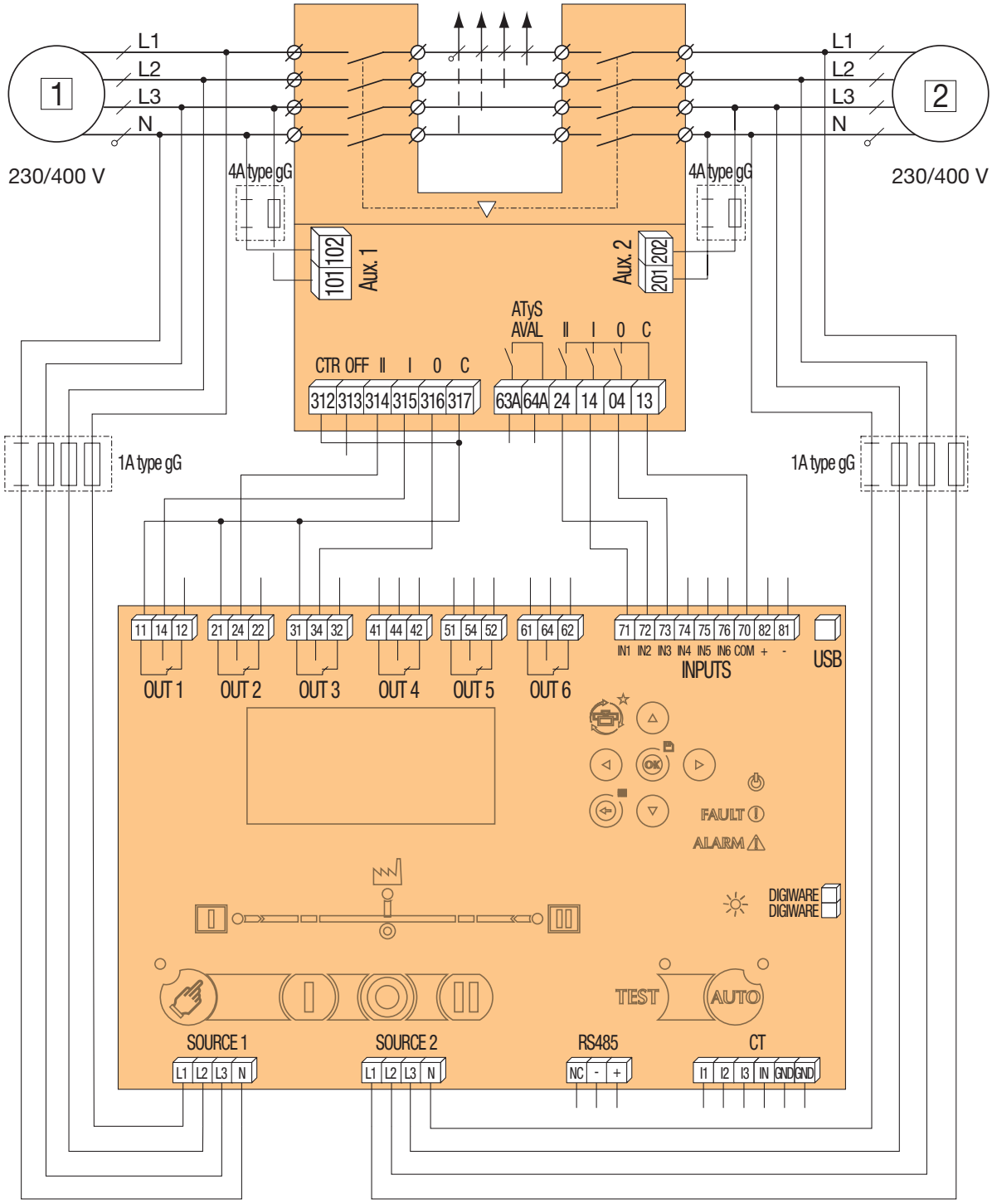
| Length (m) | Quantity | Reference | |
|---|---|---|---|
| 0.1 | 1 | 4829 0181 |  |
| 0.2 | 1 | 4829 0188 | |
| 0.5 | 1 | 4829 0182 | |
| 1 | 1 | 4829 0183 | |
| 2 | 1 | 4829 0184 | |
| 5 | 1 | 4829 0186 | |
| 10 | 1 | 4829 0187 | |
| 50 m reel + 100 connectors | | 4829 0185 | |

# 13. ANNEXES

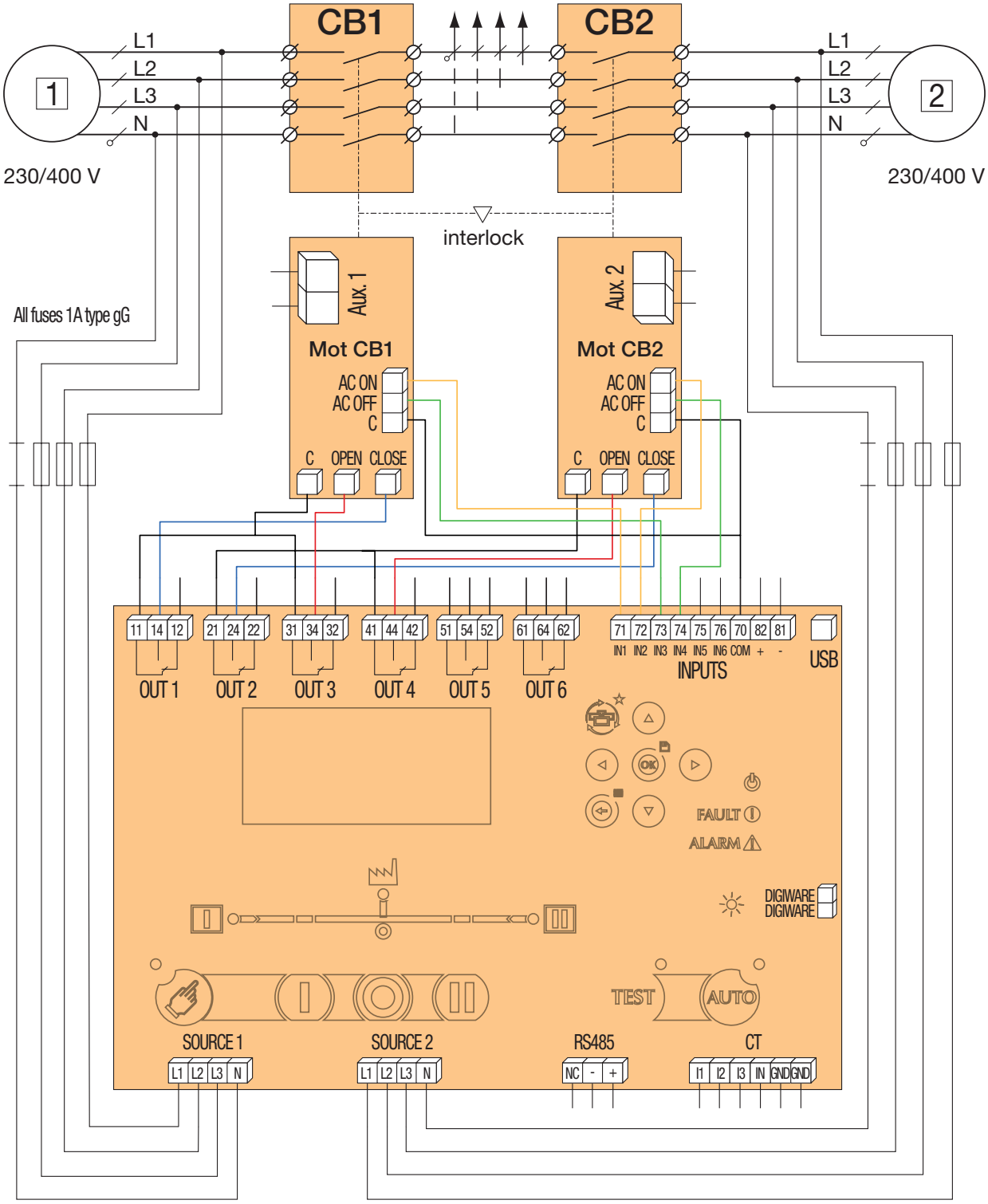
## 13.1. ANNEX I - Wiring Diagrams

The bellow diagrams detail the connections of the ATyS C55/C65 with ATyS Switches as well as the generic wiring diagram for circuit breakers.

**Connection diagram with ATYS d**



**Connection diagram with Circuit Breakers**




- Please consider Inputs and Outputs cabling are related to the configuration parameters. This schema corresponds to the ATS controller presets for the Circuit Breaker technology. The presets for each type on 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

**Note** Please note that the number of timers available on C55 and C65 are not the same.

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:<br>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:<br>When source 1 returns, 1RT is started. At the end of 1RT, source 1 is then considered to be present.<br>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.<br>⚠ 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:<br>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:<br>When source 2 returns, 2RT is started. At the end of 2RT, source 2 is then considered to be present.<br>Should source 2 disappear before the end of 2RT, the changeover will not be carried out.<br>⚠ 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:<br>Stabilisation time delay for voltage and frequency on Source (1/2) . 1/2AT starts as soon as the source voltage is above the hysteresis value. Transfer to Source 1/2 may be done at the end of this time delay.<br>⚠ 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:<br>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 | SELECTABLE RANGE | BY DEFAULT |
|---|---|---|---|---|
| 1CT / 2CT | S1/S2 GENSET COOL-DOWN (s) | Source 1 or 2 (Genset) Cool Down Timer:<br>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:<br>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 |
| EET1 | GENSET TIMEOUT S1 (h) | S1 maximum reset timer - Battery Charger maximum Off Timer. This timer defines the minimum time that the Genset must be switched off to activate the output EES (Battery Charger Signal). This doesn't involve any transfer, it's just to charge the genset batteries. | 0-1100h | 168h |
| EET2 | GENSET TIMEOUT S2 (h) | S2 maximum reset timer - Battery Charger maximum Off Timer. This timer defines the minimum time that the Genset must be switched off to activate the output EES (Battery Charger Signal). This doesn't involve any transfer, it's just to charge the genset batteries. | 0-1100h | 168h |
| EDT1 | BATTERY CHARGE DURATION S1 (s) | S1 Run timer (for batt charger). The output EES will be desactivated after this duration and battery charge will stop. | 0-9999s | 1800s |
| EDT2 | BATTERY CHARGE DURATION S2 (s) | S2 Run timer (for batt charger). The output EES will be desactivated after this duration and battery charge will stop. | 0-9999s | 1800s |

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

## TEST ON LOAD TIMERS

| TRIGRAM (ECS) | TIMER | DESCRIPTION | SELECTABLE RANGE | BY DEFAULT |
|---|---|---|---|---|
| TOT (lim/unlim) | TEST ON LOAD | Test on load limited/unlimited | - | UNLIMITED |
| TOT | TEST ON LOAD (s) - TIME / DURATION | Test On Load Duration Timer:<br>This timer defines the On Load Test time. It starts counting when the Test is initiated. The return to the main supply takes place at the end of TOT.<br>Note: TOT is configurable when TOT (LIM/UNL) above is set to LIM. | 0-21600s | 10s |
| T3T | TEST ON LOAD END (s) | Test On Load – End Delay Timer: This time delay starts counting at the end of TOT Timer. The return to the main supply takes place at the end of T3T time. | 0-1800s | 5s |
| E1T | EXTERNAL TEST ON LOAD PRE / BEFORE | External Order Test Off Load - Start Delay Timer. This time delay starts at the same time as the External On Load (EFL) order is received. At the end of this time delay, the Genset start order is activated. The load will not be transferred to the Genset supply. | 0-1800s | 5s |
| E2T (lim/unlim) | EXTERNAL TEST ON LOAD | External Test on load limited/unlimited | - | UNLIMITED |
| E2T | EXTERNAL TEST ON LOAD (s) - TIME / DURATION | External Order Test On Load - Duration Timer: This timer starts counting when the Test is initiated. The return to the main supply may initiate at the end of E2T time.<br>Note: E2T duration timer is configurable in the timers menu when at least 1 input is configured as EOL and with E2T (UNL/LIM) set to UNL. | 0-21600s | 10s |
| E3T | EXTERNAL TEST ON LOAD POST / AFTER | External Order Test On Load – End Delay Timer: This time delay starts counting at the end of E2T Timer. The return to the main supply takes place at the end of E3T time. | 0-1800 | 5s |

## TEST OFF LOAD TIMERS

| TRIGRAM (ECS) | TIMER | DESCRIPTION | - | BY DEFAULT |
|---|---|---|---|---|
| TFT (lim/ unlim) | TEST OFF LOAD | Test off load limited/unlimited | - | UNLIMITED |
| TFT | TEST OFF LOAD (s) - TIME / DURATION | Test Off Load - Duration Timer:<br>This time delay defines the On Load Test time. It starts counting when the Test is initiated. The return to the main supply takes place at the end of TFT.<br>Note: TFT is configurable in the timers menu when TFT (LIM/UNL) above is set to LIM. | 0-21600s | 600s |
| E5T | EXT TEST OFF LOAD PRE / BEFORE (s) | External Order Test On Load - Start Delay Timer. This time delay starts at the same time as the External On Load Test (EOL) order is received. At the end of this time delay, the Genset start order is activated. Once source supply 2 is available, the load is transferred to source supply 2. | 0-1800s | 5s |
| E6T (lim/ unlim) | EXT TEST OFF LOAD | External Test off load limited/unlimited | - | UNLIMITED |
| E6T | EXT TEST OFF LOAD (s) - TIME / DURATION | External Order Test Off Load - Duration Timer: This timer starts counting when the Test is initiated. | 0-21600s | 600s |
| E7T | EXT TEST OFF LOAD POST / AFTER (s) | External Order Test On Load – End Delay Timer: This time delay starts counting at the end of E6T Timer. The Genset signal will switch at the end E7T. | 0-1800s | 5s |

## SPECIFIC FUNCTIONS TIMERS

| FUNCTION | TRI-GRAM (ECS) | TIMER | DESCRIPTION | SELEC-TABLE RANGE | BY DEFAULT |
|---|---|---|---|---|---|
| In-phase Transfer | IPT | DWELL TIMER / IN-PHASE TIMER | In-phase Timer:<br>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:<br>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:<br>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:<br>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 |
| Return to 0 | 10T / 20T | S1 or S2 RETURN TO 0 (s) | Return to 0 timer:<br>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 Com-pressor | 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 | C65 | C55 |
|---|---|---|---|---|
| AC1 | SWITCH IN POS. 1 | Read position 1 from the RTSE | x | x |
| AC2 | SWITCH IN POS. 2 | Read position 2 from the RTSE | x | x |
| AC0 | SWITCH IN POS. 0 | Read position 0 from the RTSE | x | x |
| AC0A | SWITCH A IN POS.0 | Read position 0 from the SWITCH on S1 | x | x |
| AC0B | SWITCH B IN POS.0 | Read position 0 from the SWITCH on S2 | x | x |
| MAN | DOOR OPEN / MANUAL MODE | Not in auto, cover open:<br>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. | x | x |
| LCK | PADLOCKED | Product padlocked. Message on screen "padlocked", meaning that the RTSE has been padlocked. Controllers goes to Inhibit mode until input is cleared. The controller commands will be inhibit but navigation through the menu and dashboards on the display are allowed. | x | x |
| IEE | INH. GENSET SCH. | Inhibit Engine Exerciser:<br>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. | x | - |
| POP | RTSE AVAILABLE | Information coming from the RTSE to inform that the RTSE is operational. | x | x |
| PS1 | GO TO POS.1 | External order to go to pos 1<br>Position command only available if mode is in position CTRL. The last command received has priority. | x | x |
| PS2 | GO TO POS.2 | External order to go to pos 2<br>Position command only available if mode is in position CTRL. The last command received has priority. | x | x |
| PS0 | GO TO POS.0 | External order to go to pos 0<br>Position command only available if the mode is in position CTRL. Command 0 has priority over commands I and II. | x | x |
| RT0 | RETURN TO 0 | Overrides the "Return to 0" function inside SPECIFIC FUNCTIONS | x | - |
| BLK | BLOCKED | Product blocked, meaning that the RTSE is blocked, can't move. The controller will go into Partial Inhibition (starting the genset if necessary) but not transfering. Message on the display "Product blocked" | x | x |
| TP1 | INPUT TRIP 1 | Protection on S1 has tripped | x | x |
| TP2 | INPUT TRIP 2 | Protection on S2 has tripped | x | x |
| EST | EMERGENCY SIGN. | Emmergency off signal. Controller will pilot to go to position 0 (if any). CTRL will be disabled, AUTOMATIC mode will be off, genset won't be started, "Emergency Off" will be displayed on screen. If Lift/Elevator signal is enabled, its timers will be respected before giving the command to go to 0. | x | x |
| IPI | IN-PHASE INHIBIT | In-phase transfer inhibition:<br>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. | x | - |
| IPB | IN-PHASE BYPASS | In-phase bypass:<br>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. | x | - |
| BCT | BYPASS TIMER | Bypass timer:<br>Bypasses the current timer on the screen / first one of the list of timers running. | x | x |
| ELB | LIFT BYPASS | It will bypass the elevator delay timer (ELD) when active, if the elevator function is active. | x | - |
| 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 | x | - |
| 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 | x | - |
| - | NONE | INPUT NOT USED | x | x |

| TRIGRAM | INPUT NAME | DESCRIPTION | C65 | C55 |
|---|---|---|---|---|
| INH | INHIBIT | Inhibition of the automatism. Mode inhibition (not automatic). CTRL is permitted. Genset won't start if the source is lost | x | x |
| INHp | PARTIAL INHIBITION | Inhibition of the automatism. Mode inhibition (not automatic). CTRL is permitted. Genset will start if the source is lost to ensure the supply of the controller, but it will not transfer. | x | x |
| INHt | TOTAL INHIBITION | Inhibition of the automatism. Mode inhibition (not automatic). CTRL is NOT permitted. Genset won't start if the source is lost | x | x |
| TON | TEST ON LOAD | Start test on load with dedicated test on load timers | x | x |
| TOF | TEST OFF LOAD | Start test off load with dedicated test on load timers | x | x |
| EON | EXT. LOAD | Remote on load test:<br>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. | x | x |
| EOF | EXT. NO LOAD | Remote off load test:<br>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. | x | x |
| MRT | MANUAL RETRANS | Manual Retransfer to priority source (touching keypad or via INPUT)<br>Remote transfer back to the priority source:<br>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. | x | x |
| PRI | CHANGE PRIO | Changes the priority between sources | x | x |
| SS1 | BYPASS STAB S1 | Bypasses the stabilisation timer for S1 | x | x |
| SS2 | BYPASS STAB S2 | Bypasses the stabilisation timer for S2 | x | x |
| 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 | x | x |
| FTE | EXT FAULT | External fault active. The product will transfer to position 0 / center off. CTRL is permitted. Mode will be inhibit. Genset will not start if source is lost. "External Fault will be displayed on screen". It will be logged in the fault log as External Fault and the Fault LED will be active. The fault will be In progress until input is cleared and fault reset. | x | x |
| MSR | PRIO TEST ON LOAD | EJP / Stay on "backup" source. Priority Test on Load. Order to stay in S2 even if the source is lost or unavailable. | x | x |
| OA1 | FORCE S1 AVAIL. | Force Source 1 as Available | x | x |
| OA2 | FORCE S2 AVAIL. | Force Source 2 as Available | x | x |
| OU1 | FORCE S1 UNAVAIL. | Force Source 1 as Unavailable | x | x |
| OU2 | FORCE S2 UNAVAIL. | Force Source 2 as Unavailable | x | x |
| RST | RST FAULT STATE | Fault Reset :<br>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. | x | x |
| 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. | x | - |
| CHP | CHANGE PRIO | Changes the position (if no priority defined). It partially inhibits when active. It goes back to Auto when cleared. It has to be a permanent maintained input, it can't be an impulse. | - | x |
| REC | AUTO/MANU | Places the controller in manual mode remotely | x | x |

## 13.4. ANNEX IV - Output list

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

| TRIGRAM | OUTPUT NAME | DESCRIPTION | C65 | C55 |
|---|---|---|---|---|
| PO1 | POS 1 ORDER | Switch position order to go to Source 1 | x | x |
| PO2 | POS 2 ORDER | Switch position order to go to Source 2 | x | x |
| PO0 | POS 0 ORDER | Switch position order to go to Source 0 | x | x |
| PA0 | POS 0 ORDER S1 | Switch position order to go to center-off (source 1) | x | x |
| PB0 | POS 0 ORDER S2 | Switch position order to go to center-off (source 2) | x | x |
| S1A | S1 AVAILABLE | Source 1 available:<br>Output activated if source 1 is considered as available (see conditions of availability in the dedicated chapter of the manual). | x | x |
| S2A | S2 AVAILABLE | Source 2 available:<br>Output activated if source 2 is considered as available (see conditions of availability in the dedicated chapter of the manual). | x | x |
| SCA | ANY SOURCE AVAIL. | Source 1 OR source 2 available:<br>This output is activated when at least one source (S1 or S2) is available. | x | x |
| S1U | S1 UNAVAIL. | Source 1 unavailable:<br>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. | x | x |
| S2U | S2 UNAVAIL. | Source 2 unavailable:<br>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. | x | x |
| AC1 | S1 CLOSED | Source 1 closed:<br>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. | x | x |
| AC2 | S2 CLOSED | Source 2 closed:<br>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. | x | x |
| AC0 | OFF POSITION | Both sources open (center-off):<br>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. | x | x |
| LO1 | S1 CLOSED + AVAIL | Load being supplied by source 1:<br>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. | x | - |
| LO2 | S2 CLOSED + AVAIL | Load being supplied by source 2:<br>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. | x | - |
| 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. | x | - |
| FLT | FAULTS ACTIVE | At least 1 fault is active on the controller. Fault report | x | x |
| POP | PROD. OPERATIONAL | Information abut the availability and correct functioning of the ATSE. The input POP should be enabled and linked to the availability output of the RTSE. | x | - |
| LCK | PRODUCT LOCKED | Report of padlocking of the product. | x | - |
| COP | CTRL OPERATIONAL | Controller operational:<br>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. | x | - |
| TOS | TEST ON LOAD | This output is activated if a load test (thought the HMI) is ongoing. | x | - |
| EOS | EXT TEST ON LOAD | This output is activated if a load test (remote order) is ongoing. | x | - |

| TRIGRAM | OUTPUT NAME | DESCRIPTION | C65 | C55 |
|---|---|---|---|---|
| ROS | (EXT) TEST ON LOAD | This output is activated if any load test (either HMI or remote order) is ongoing. | x | x |
| 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. | x | - |
| EES | BATTERY CHARGER | Output to activate the battery charging. It is linked to the battery charger timmers. | x | - |
| TPP | TRIP PARTIAL | Report of protection tripping in one of the sources. | x | - |
| TPT | TRIP TOTAL | Report of protection tripping on both sources. | x | - |
| IPT | IPT IN PROGRESS | In Phase Transfer going on. | x | - |
| CO1-CO6 | COPY INPUT x | Active when the corresponding input will be active | x | - |
| 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. | x | - |
| 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. | x | - |
| ARO | CRIT. ALM. ACTIVE | 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. | x | x |
| 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. | x | - |
| - | NONE | OUTPUT NOT USED | x | x |
| 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). | x | x |
| GS2 | GENSET S2 START | Genset start/stop output. Only available on OUT 6 when the source is a generator. | x | x |
| AUD | CRIT. ALM. ACTIVE | Output active when an alarm with the criticity CRITICAL is active) | x | x |

**Note**

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

## 13.5. ANNEX V - ATyS C55/C65 Technical characteristics

| **Mechanical features** | |
|---|---|
| Casing type | Fitted on a door (160x220) or back-plate |
| Case material | PC (Polycarbonate) |
| Protection degree | IP65 front panel /IP30 without gasket/<br>IP20 rear panel |
| Screen resolution | 350x160 pixels – 8 lines of text |
| Weight | 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 | 1A gG |
| **DC Power** | |
| Rated battery voltage<br>DC Aux supply for IO modules | 12-24VDC +/-20%<br>24VDC |
| Reverse polarity protection | yes |
| Maximum drawn current | 3A peak <10ms |
| Recommended fuses | 1A gG |
| **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 (Only C65))** | |
| 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<br>AC15 2A 277Vac 50/60Hz<br>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<br>AC15 2A 277Vac 50/60Hz<br>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 | 1200m @9600 baud<br>200m @115200 baud |
| Termination | internal 120 ohms (selectable DIP switch) |
| **DIGIWARE BUS (Only C65)** | |
| Function | Connection between ATyS C65 and external modules |
| Cable type | Specific cable with RJ45 connections |
| **Environmental specifications** | |
| Ambient operating temperature | -30° … +70°C |
| Storage temperature | -40° … +70°C |
| Operating humidity | 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 | 240x180x64 |
| Weight | 1085gr |
| **Event recorder** | |
| Capacity | 3000 events (only C65, 300 for C55) + 100 alarms |
| 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**<br>**(not in menu)** | MIMIC<br>STATUS<br>METERING<br>POWER AND ENERGY*<br>TIMERS<br>ALARMS<br>I/O | | |
| **CONTROL**<br>**PWD: 4000** | MODE / POSITION | MODE<br>CHANGE POSITION<br>GENSET SOURCE 1<br>GENSET SOURCE 2 | |
| | TEST | LOAD TEST<br>NO LOAD TEST | |
| | MANUAL RETRANSFER | PRESS OK FOR MANUAL RETRANSFER | |
| **EVENTS**<br>**PWD: 4000** | EVENT LOG | | |
| | EVENT BY DATE* | | |
| | ALARM LOG | IN PROGRESS<br>HISTORY | |
| **PWD: 1000** | FAULT LOG | IN PROGRESS<br>HISTORY<br>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<br>PERIODIC SCHEDULE<br>TEST DURATION (s)<br>START DATE<br>START TIME<br>END DATE<br>END TIME | |
| | CUSTOM 2* | TYPE SET<br>PERIODIC SCHEDULE<br>TEST DURATION (s)<br>START DATE<br>START TIME<br>END DATE<br>END TIME | |
| | CUSTOM 3* | TYPE SET<br>PERIODIC SCHEDULE<br>TEST DURATION (s)<br>START DATE<br>START TIME<br>END DATE<br>END TIME | |
| | CUSTOM 4* | TYPE SET<br>PERIODIC SCHEDULE<br>TEST DURATION (s)<br>START DATE<br>START TIME<br>END DATE<br>END TIME | |

| MENU | SUBMENU 1 | SUBMENU 2 | SUBMENU 3 |
|---|---|---|---|
| PARAMETERS<br>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**<br>**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**<br>**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<br>CHANGE CONFIG PWS<br>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) | |
| | RETURN TO 0* | 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 | | |

All the menus with "*" are only available for ATyS C65.

## 13.7. ANNEX VII - Communications table

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