Command channel: local or remote command

A command channel gives the possibility to command the motor by the soft starter (start, stop…).
it can also read or write parameters.

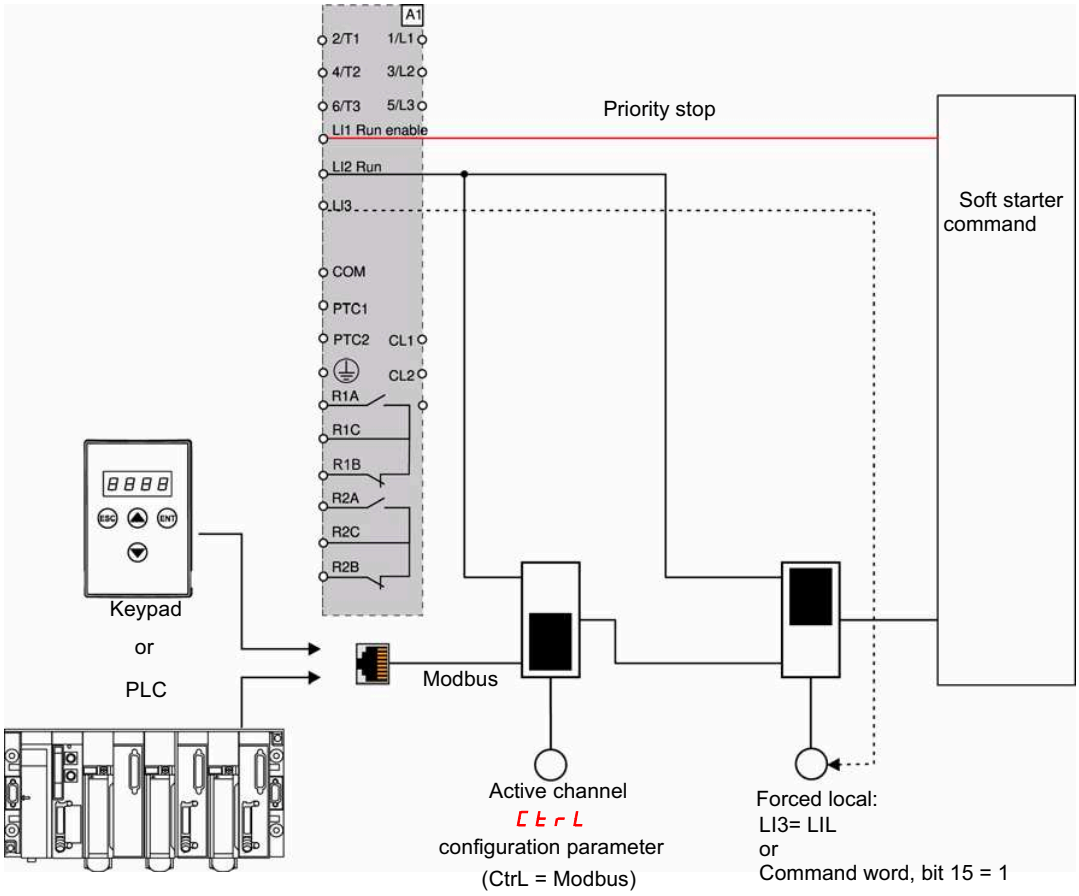
In local command mode, the Altistart 22 can be set from the display terminal:

- Use the 4 keys to enter into the menu.

In remote command, the Altistart 22 soft starter can be set from the remote keypad:

- The remote keypad can be used in a similar way than the embedded keypad, it means that the HMI on the remote keypad has the same behavior as the HMI on the product.

Note: Some command channels can also read or write parameters.



In this example, LI3 is configured to forced local command (LIL).

If CtrL = Modbus + forced local: it's forced local in first.

LOCAL mode: The soft starter is entirely controlled via the terminals. The parameters can be read and written via Modbus. The soft starter remains in LOCAL mode as long as the CtrL = 0.

FORCED LOCAL mode: The soft starter is entirely controlled via the terminals. Write access to the parameters from the Modbus link is prohibited. Reading is possible.

Note: LI1 must be activated (LI1 = 1) to allow the remote command.
A switch can be used on LI1 if a local stop by the terminal is needed. In this case, the stop will be in freewheel.

Command channel

Behavior on channel change

In the COP menu (Advanced communication), the active channel can be changed via CtrL parameter:

Code	Name	Range	Default value
CtrL	command channel	0: local command 1: Remote command: Modbus	0

CtrL parameter is a configuration parameter that can be modified when the motor is stopped.

In the IO menu (Advanced IO), a Logic input can be assigned to local command: :

Code	Name	Value
LI2 or LI3	Logic input 2 or logic input 3	LIL : Forced Local command

The local remote input is active at level 1.
When the input local remote is active, the active command channel is the local channel.
When the local force function is active from a Logic input, the parameters can only be written by the local HMI or the external keypad. If written by Modbus function 6 or 16, the exception 1 bad function is sent back.
When the local force function is active, Modbus command word and parameters can be written also by Modbus.

The Logic input assign to "Forced local command" has the priority on bit 15 from Modbus command word. If LI3 is assigned to LIL and LI3=1, even if bit 15=1 the "Forced local command" is active.

When CTRL = Modbus and LI force local command activated, then a Modbus request 6 or 16 sends back an exception code 1 illegal function.

When on Modbus, only LI1 stop is taken into account.

Command word

The control register write definition is changed as follows:

The Altistart 22 incorporates one control register intended for controlling the Altistart 22.
Address: The control register address is: 752.
In order to control the Altistart 22 using the control register:

- Use Function 16 or function 6
- Use Address_High (page) = 2
- Use Address_Low = 240 (0F0H)
- Write to one register only
- Set comm_control (CtrL) to 1 for Modbus

Bit	Function	Comment
bit 0	RUN/STOP	Write "1" (On) to RUN Write "0" (oFF) to STOP, in configured stop (DEC parameter)
bit 1	reserved	
bit 2	reserved	
bit 3	trip reset	Write "1" to reset
bit 4	reserved	
bit 5	reserved	
bit 6	reserved	
bit 7	reserved	
bit 8	reserved	
bit 9	reserved	
bit 10	Freewheel stop	Write "1" to set freewheel deceleration, linked with bit 0
bit 11	2nd set of parameters	Write "1" to enable second set of parameters
bit 12	reserved	
bit 13	reserved	
bit 14	reserved	
bit 15	Forced local command	Write "1" (On) forces local command

Status word

The Status register address is: 256
- Use Function 3 only
- Use Address_High (page) = 1
- Use Address_Low = 0 (00H)
- Read one register only

Bit	Function	Comment
bit 0	Ready	All the conditions that will permit the operation of a switching device by the remote host controller have been fulfilled.
bit 1	On	The main circuit contacts are closed or the semiconductor switches of semiconductor switching device are in the conducting state (ACC, DEC and BYPASS).
bit 2	Trip	A trip condition exists.
bit 3	Warning	A warning condition exists.
bit 4	Reserved	
bit 5	LI3	
bit 6	LI2	
bit 7	LI1	
bit 8	(Motor current in %)	The motor current is expressed as a percentage of the motor rated current. Range is 0-200%. 6 bits code 200% = 63 (decimal) = 111111 (binary)
bit 9		
bit 10		
bit 11		
bit 12		
bit 13		
bit 14	Local control	The indication to a remote host controller that as a result of operator intervention, commands received will not be accepted or acted upon (forced local command).
bit 15	Ramping	Accelerating or decelerating the motor.

Modbus Function

This section describes the connection to the bus or network, signaling, diagnostics, and configuration of the communication-specific parameters via the 7-segment LED display.
It also describes the communication services of the Modbus protocol.

Modbus Protocol

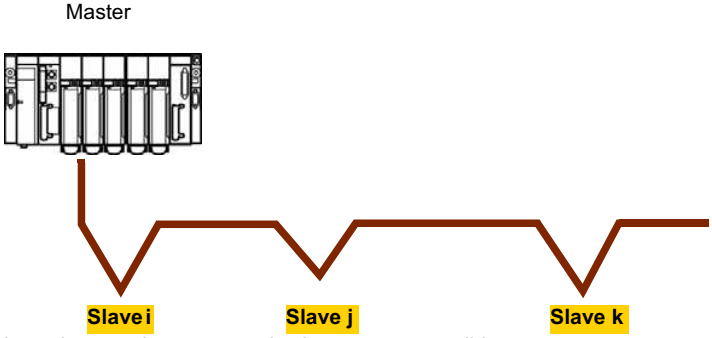
The transmission mode used is RTU mode. The frame contains no message header byte, nor end of message bytes.
It is defined as follows:

Slave address	Request code	Data	CRC16

The data is transmitted in binary code.
CRC16: cyclical redundancy check.
The end of the frame is detected on a silence greater than or equal to 3 characters.

Principle

The Modbus protocol is a master-slave protocol.



Only one device can transmit on the line at any time.
The master manages the exchanges and only it can take the initiative.
It interrogates each of the slaves in succession.
No slave can send a message unless it is invited to do so.
The master repeats the question when there is an incorrect exchange, and declares the interrogated slave absent if no response is received within a given time period.
If a slave does not understand a message, it sends an exception response to the master. The master may or may not repeat the request.

Direct slave-to-slave communications are not possible.

For slave-to-slave communication, the application software must therefore be designed to interrogate a slave and send back data received to the other slave.

Two types of dialogue are possible between master and slaves:
- the master sends a request to a slave and waits for its response
- the master sends a request to all slaves without waiting for a response (broadcasting principle)

Addresses

- The soft starter Modbus address can be configured from 1 to 247.
- Address 0 coded in a request sent by the master is reserved for broadcasting. ATS22 take account of the request, but do not respond to it.

Supported Modbus functions

The Altistart 22 supports the following Modbus functions.

Function name	Code	Description	Remarks
Read holding registers	03 16#03	Read N output words	Max PDU length : 63 words
Write one output word	06 16#06	Write one output word	
Write multiple registers	16 16#10	Write N output word	Max PDU length : 61 words
(Sub-function) Read device Identification	43 16#2B	Read device identification	

The following paragraphs describes each supported function.

Read Holding registers

Request

Function code	1 Byte	**0x03**
Starting Address	2 Bytes	0x0000 to 0xFFFF
Quantity of Registers	2 Bytes	1 to 63 (0x 3F)

Response

Function code	1 Byte	**0x03**
Byte count	1 Byte	2 x N*
Register value	N* x 2 Bytes	

*N: Quantity of Registers

Error

Error code	1 Byte	**0x83**
Exception code	1 Byte	01 or 02 or 03 or 04 (see details on page 72)

Example

Note: Hi = high order byte, Lo = low order byte.

This function can be used to read all ATS22 words, both input words and output words.

Request

Slave no.	03	No. of first word		Number of words		CRC16	
		Hi	Lo	Hi	Lo	Lo	Hi
1 byte	1 byte	2 bytes		2 bytes		2 bytes	

Response

Slave no.	03	Number of bytes read	First word value		-------	Last word value		CRC16	
			Hi	Lo		Hi	Lo	Lo	Hi
1 byte	1 byte	1 byte	2 bytes			2 bytes		2 bytes	

Example: read 2 words 'ACC and DEC at Modbus address 19 and 20 to W3105 (16#0013 to 16#0014) in slave 2, using function 3, where:

- ACC - Acceleration = 10
- DEC - Deceleration = 0

Request	02	03	0019		0002	CRC16
Response	02	03	04	000A	0000	CRC16
		Value of:		W0019	W020	
		Parameters:		ACC	DEC	

Write one output word

Request

Function code	1 Byte	**0x06**
Register Address	2 Bytes	0x0000 to 0xFFFF
Register value	2 Bytes	0x0000 to 0xFFFF

Response

Function code	1 Byte	**0x06**
Register Address	2 Bytes	0x0000 to 0xFFFF
Register value	2 Bytes	0x0000 to 0xFFFF

Error

Error code	1 Byte	**0x86**
Exception code	1 Byte	01 or 02 or 03 or 04 (see details on page 72)

Example

Request and response (the frame format is identical)

Slave no.	06	Word number		Value of word		CRC16	
		Hi	Lo	Hi	Lo	Lo	Hi
1 byte	1 byte	2 bytes		2 bytes		2 bytes	

Example: write value 16#0008 in word W0022 (16#2329) in slave 2 Snb Number of starts 8.

Request and response	02	06	0016	0008	CRC16

Read Device Identification

ID	Name / Description	Type
0x00	VendorName	ASCII String
0x01	ProductCode	ASCII String
0x02	MajorMinorRevision	ASCII String

Example

Default values to be detailed

Request

Slave no.	2B	Type of MEI 0E	ReadDeviceId 01	Object Id 00	CRC16 Lo	CRC16 Hi
1 byte	1 byte	1 byte	1 byte	1 byte	2 bytes	

Response

Slave no.	2B	Type of MEI 0E	ReadDeviceId 01	Degree of conformity 02	-------
1 byte	1 byte	1 byte	1 byte	1 byte	

-------	Number of additional frames 00	Next object Id 00	Number of objects 03	-------
	1 byte	1 byte	1 byte	

-------	Id of object no. 1 00	Length of object no. 1 12	Value of object no. 1 “Schneider Electric”	-------
	1 byte	1 byte	18 bytes	

-------	Id of object no. 2 01	Length of object no. 2 0B	Value of object no. 2 “ATS22XXXXXX”	-------
	1 byte	1 byte	11 bytes	

-------	Id of object no. 3 02	Length of object no. 3 04	Value of object no. 3 “0201”	-------
	1 byte	1 byte	4 bytes	

-------	CRC16 Lo	CRC16 Hi
	1 byte	1 byte

The total response size equals 49 bytes

The three objects contained in the response correspond to the following objects:

- Object no. 1: Manufacturer name (always “Schneider Electric”, ie. 18 bytes).
- Object no. 2: Device reference (ASCII string; *for example:* “ATS22XXXXXX”, ie. 11 bytes).
- Object no. 3: Device version, in “MMmm” format where “MM” represents the determinant and “mm” the subdeterminant (4-bytes ASCII string; *for example:* “0201” for version 2.1).

Note: The response to function 43 may be negative; in this case, the response located at the top of the next page is sent by the Altistart 22 rather than the response described above.

Error management

Exception responses

An exception response is returned by a slave when it is unable to perform the request which is addressed to it.

Format of an exception response:

Slave no.	Response code	Error code	CRC16	
			Lo	Hi
1 byte	1 byte	1 byte	2 bytes	

Response code: request function code + 16#80.

Error code:
1 = The function requested is not recognized by the slave
2 = The bit or word addresses indicated in the request do not exist in the slave
3 = The bit or word values indicated in the request are not permissible in the slave
4 = The slave has started to execute the request but cannot continue to process it completely

CRC16 calculation

The CRC16 is calculated on all the message bytes by applying the following method:

Initialize the CRC (16-bit register) to 16#FFFF.

Enter the first to the last byte of the message:

CRC XOR <byte> —> CRC
Enter 8 times
Move the CRC one bit to the right
If the output bit = 1, enter CRC XOR 16#A001—> CRC
End enter
End enter

The CRC obtained will be transmitted with the low order bytes sent first, followed by the high order ones (unlike the other data contained in Modbus frames).

XOR = exclusive OR.

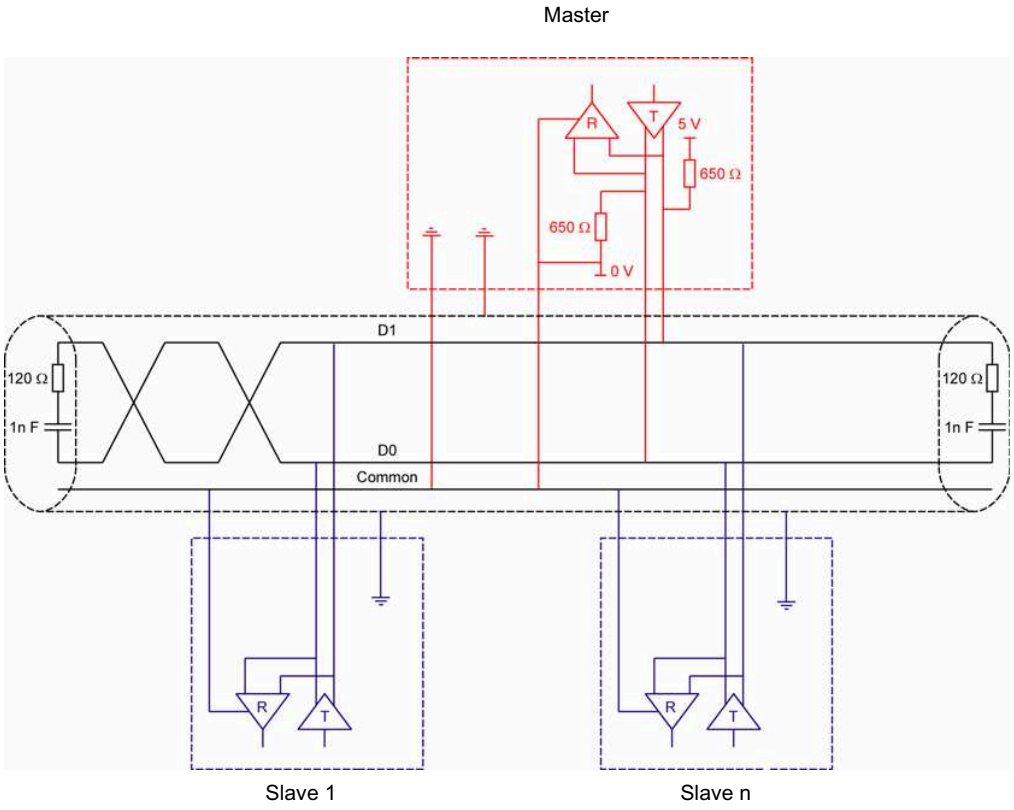
Connection to RS485 bus

Standard schematic

The standard schematic corresponds to the Modbus specification published on the Modbus.org site in 2002 (Modbus_over_serial_line_V1.pdf, Nov 2002) and in particular to the schematic of the 2-wire multidrop serial bus.

The ATS22 follows this specification.

Schematic diagram:



Type of trunk cable	Shielded cable with 1 twisted pair and at least a 3rd conductor
Maximum length of bus	1000 m at 19200 bps with the Schneider Electric TSX CSA●●● cable
Maximum number of stations (without repeater)	32 stations, ie. 31 slaves
Maximum length of tap links	• 20 m for one tap link • 40 m divided by the number of tap links on a multiple junction box
Bus polarisation	• One 450 to 650 Ω pulldown resistor at 5 V (650 Ω recommended) • One 450 to 650 Ω pulldown resistor at the Common (650 Ω recommended) This polarization is recommended for the master.
Line terminator	One 120 Ω 0.25 W resistor in series with a 1 nF 10 V capacitor
Common polarity	Yes (Common), connected to the protective ground at one or more points on the bus

Maintenance

Servicing

It is advisable to perform the following actions regularly:

- Check the condition and tightness of connections.
- Ensure that the temperature around the unit remains at an acceptable level and that ventilation is effective (average service life of fans: 3 to 5 years depending on the operating conditions).
- Ensure proper fan operation.
- Remove any dust from the soft starter.
- Check physical damages to the soft starter.

Spare parts and repairs

Consult Schneider Electric products support.

Soft starter does not start, no trip code displayed

- No display:
  - check that the line supply is present on the control supply CL1/CL2,
  - check if a short circuit is not existing on the Modbus network cable (especially between RJ45 pin 7 and RJ45 pin3 or pin8. See pages 35 and 36).
- Check that the code displayed does not correspond to the normal state of the soft starter (see page 46).
- Check for the presence of the RUN/STOP commands (see page 37).

Soft starter does not start, trip code displayed

- Trip code flashes on the display.
- Storing of the last 7 trips, visible with SoMove software workshop.
- The soft starter locks and the motor stops with to freewheel mode.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Read and understand this manual before installing or operating the Altistart 22. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical code requirements with respect to grounding of all equipment.
- Many parts of this soft starter, including the printed circuit boards, operate at the line voltage. DO NOT TOUCH. Use only electrically insulated tools.
- DO NOT touch unshielded components or terminal strip screw connections with voltage present.
- Before servicing the soft starter:
  - Disconnect all power, including external control power that may be present.
  - Place a “DO NOT TURN ON” label on all power disconnects.
  - Lock all power disconnects in the open position.
- Install and close all covers before applying power or starting and stopping the soft starter.

Failure to follow these instructions will result in death or serious injury.

Trip code displayed	Name	Remedy
bPF	Bypass contactor detected fault	• Check for a welded bypass contactor or shorted SCR • Replace it if necessary
CFF	Invalid configuration on power-up	• Revert to the factory setting in the soft starter UtIL menu • Reconfigure the soft starter
EtF	External detected fault	• Clear the cause of the detected fault
GrdF	Ground leakage current detected fault	• Check the electrical insulation of the motor • Check the installation • Check the values of Grdd, Grdt parameters in PrO menu page 57
InF	Internal detected fault	• Disconnect and reconnect the control supply. If the detected fault persists, contact Schneider Electric product support
OCF	Motor overcurrent	• Check the values of OCd and OCt parameters in PrO menu page 56
OHF	Over heat detected fault	• Check the sizing of the soft starter in relation to the motor and the mechanical requirement • Check the operation of the fan (if the Altistart 22 used has one), ensuring that the air passage is not obstructed in any way and the heatsink is clean. Ensure that the mounting recommendations are observed • Wait for the Altistart 22 cooling before restarting
OLF	Overload motor	• Check the mechanism (wear, mechanical play, lubrication, blockages, etc.) • Check the sizing of the soft starter motor in relation to the mechanical requirement • Check the value of tHP parameter in SEt menu page 52 and In parameter in conF menu page 50 • Wait for the motor to cool before restarting
OSF	Overvoltage	• Check ULn parameter in conF menu • Check the power supply circuit and voltage • Check OSd and OSt parameters in PrO menu
OtF	Motor Over Temperature • Motor thermal trip detected by the PTC probes	• Check the mechanism (wear, mechanical play, lubrication, blockages, etc.) • Check the sizing of the soft starter motor in relation to the mechanical requirement • Check the value of PtC setting in PrO menu page 59 • Wait for the motor to cool before restarting

Trip code displayed	Name	Remedy
PHbd	Phase unbalance	• Check the line voltage. • Check the values of Ubd, Ubt parameters in PrO menu page 57.
PHF	Loss of a line phase	• Check the line voltage, the connection to the soft starter and any isolating devices located between the line and the soft starter (contactors, fuses, circuit breakers, etc.). • Check the motor connection and any isolating devices located between the soft starter and the motor (contactors, circuit breakers, etc.). • Check the motor state.
	Line frequency, out of tolerance This detected fault can be configured in PrO menu	• Check the line frequency. • Check the configuration of PHL.
P IF	Phase inversion Line phase inversion does not conform to the selection made by PHr in PrO menu	• Invert two lines phases or set PHr = oFF.
trAP	Trap code	• Disconnect and reconnect the control supply. If the detected fault persists, contact Schneider Electric support.
SCF	Short circuit: • short-circuit on soft starter output	• Switch the soft starter off. • Check the connecting cables and the motor insulation. • Check the thyristors. • Check the bypass contactor (contact stuck).
SLF	Modbus Time Out	• Serial link detected fault. Check the RS485 connection.
SnbF	Too many starts	• The number of soft starts has exceeded the maximum allowed by Snb in SLG period. See Snb page 53.
SSCr	Shorted thyristor or wrong connection	• Check the thyristors. • Check the bypass contactor (contact stuck). • Check the motor connections.
StF	Starting time detected fault • Too long start time	• Check the mechanism (wear, mechanical play, lubrication, blockages, etc.) • Check that tLS (Max start time) is bigger than ACC (Acceleration time). See SEt menu page 51. • Check the sizing of the soft starter motor in relation to the mechanical requirement • Check ILt value : if the value is too low, the motor may not reach acceleration and full speed.
tbS	Too many starts	• Wait 5 minutes for frame size A. • Wait 15 minutes for frame sizes B, C, D and E. tbS appears after SnbF trip message, when trying to reset the soft starter before end of the timer.
UCF	Motor underload (undercurrent)	• Check the values of UId and UIt parameters in PrO menu page 57.
USF	Under voltage or no voltage	• Check UIn, USd and USt parameters in PrO menu • Check line voltage.

Remote keypad messages

Display		Message	Description
InIt		On initializing itself	Microcontroller initializing. Communication configuration searching.
COME	flashing	Communication interruption	It has 50 ms time out. This message is shown after 20 times retrying.
A - 17	flashing	Key alarm	• Key has been held consecutively more than 10 seconds. • Membrane switch disconnected. • Keypad waked up while a key is holding.
CLr	flashing	Confirm trip reset	This is shown when : First time STOP key has been pressed while the soft starter has tripped in detected fault.
dEUE	flashing	Soft starter mismatch	Soft starter type (brand) did not match with keypad type (brand).
rOME	flashing	ROM trip	Keypad ROM detected fault.
rAME	flashing	RAM trip	Keypad RAM detected fault.
CPUE	flashing	CPU trip	Keypad CPU detected fault.

Parameter Index and Modbus addresses

Code	Page	Name	Unit	Modbus code and Adjustment Range (1)	Description	Modbus address	Factory setting	User setting
ACC	52	Acceleration time	s	1 to 60	-	19	10	
ACC2	55	2nd acceleration time	s	1 to 60	-	42	10	
Add	62	Modbus address	-	0 = oFF 1 to 247	off Modbus address	80	oFF	
bSt	53	Boost time	s	0.0 to 1.0	1 with Modbus = 0.1s	34	0	
Cod	50	Setting lock	-	0 = nLOC 1 = LOC	not locked locked	4	nLoc	
CtrL	62	Command channel	-	0 = LCL 1 = dbS	0 – Local (LCL) 1 – Modbus (dbS)	84	LCL	
dEC	52	Deceleration time	s	0 = FrEE 1 to 60	freewheel deceleration -	20	FrEE	
dEC2	55	2nd deceleration time	s	0 = FrEE 1 to 60	freewheel deceleration -	43	FrEE	
dEF1	63	Trip history 1	-	01 = UCF 02 = OCF 03 = PHbd 04 = GrdF 05 = OLF 06 = OtF 07 = OHF 08 = PIF 09 = PHF 10 = USF 11 = OSF 12 = StF 13 = SnbF 14 = SSCr 15 = EtF 16 = InF 17 = SLF 18 = trAP 19 = SCF 20 = bPF 21 = CFF	01 = Motor underload (undercurrent) 02 = Motor overcurrent 03 = Phase unbalance 04 = Ground leakage current detected fault 05 = Overload motor 06 = Motor Over Temperature 07 = Over heat detected fault 08 = Phase inversion 09 = Loss of a line phase 10 = Under voltage or no voltage 11 = Over Voltage 12 = Starting time detected fault 13 = Too Many Starts 14 = Shorted thyristor or wrong connection 15 = External detected fault 16 = Internal detected fault 17 = Modbus Time Out 18 = Trap code 19 = Short-circuit 20 = Bypass contactor detected fault 21 = Invalid configuration on power-up	282	-	
dEF2	63	Trip history 2	-			283	-	
dEF3	63	Trip history 3	-			284	-	
dEF4	63	Trip history 4	-			285	-	
dEF5	63	Trip history 5	-			286	-	
dEF6	63	Trip history 6	-			287	-	
dEF7	63	Trip history 7	-			288	-	
dEF8	63	Trip history 8	-			289	-	
dEF9	63	Trip history 9	-			290	-	
dEFt	63	Total number of trips	-	-	-	278	-	
dICL	63	Trip current	A	0 to 999	-	280	-	
dLtA	50	Connection type	-	0 = LInE 1 = dLt	in line connection inside delta connection	1	LInE	
EdC	52	End of deceleration	-	0 to 10	-	21	0	
FAn	61	Fan management	-	0 = AUto 1 = On 2 = oFF 3 = HAnd	auto on off manual	76	AUto	
FCS	64	Back to factory settings	-	1	= 1 to perform FCS	130	-	

(1) Modbus code = Soft starter message
example : oFF on the soft starter will be equivalent to "0" with Modbus protocol (remote command)
* : parameter visible only with Modbus

Parameter Index and Modbus addresses

Code	Page	Name	Unit	Modbus code and Adjustment Range (1)	Description	Modbus address	Factory setting	User setting
For	62	Modbus format	-	0 = 8o 1 1 = 8E 1 2 = 8n 1 3 = 8n2	8 bit, odd parity, 1 stop bit 8 bit, even parity, 1 stop bit 8 bit, no parity, 1 stop bit 8 bit, no parity, 2 stop bit	82	8E 1	
Freq*		Frequency	Hz	-	-	265	-	
Grdd	57	Ground leakage current threshold	% of In	10 to 100 10 1 = oFF	- Off	54	25 for S6 and S6U OFF for Q	
Grdt	57	Ground leakage current time delay	s	1 to 60	-	55	5	
IcL	50	Soft starter rated current	A	-	-	0	Read from the power card's serial EEPROM	
IG*		Integral gain	%	0 to 100%	This parameter is reserved for expert mode. Active when SSC = On	38	20	
ILt	51	Current limit	% of In	200 to 700% max. value: 350% of IcL	-	17	350	
ILt2	55	2nd current limit	% of In	200 to 700% max. value: 350% of IcL	-	41	350	
In	50	Motor rated current	A	0.4 IcL to IcL	-	3	According to the soft starter rating	
In2	55	2nd motor rated Current	A	0.4 IcL to IcL	-	44	According to the soft starter rating	
ItH	59	Overload protection	-	0 = oFF 1 = rUn 2 = On	off run on	63	On	
LAC	50	Advanced mode	-	0 = oFF 1 = On	off on	5	oFF	
LCr1	47	LCr1		Phase 1 Current, Amp		257		
LCr2	47	LCr2		Phase 2 Current, Amp		258		
LCr3	47	LCr3		Phase 3 Current, Amp		259		
LED*		LEDS Status		d4: COMM LED (0=OFF,1=ON) d6: Ready LED (0=OFF,1=ON) d7: Run LED (0=OFF,1=ON). Flashing during soft start / soft stop. d8: Trip LED (0=OFF,1=ON) Note: other bits are reserved.		269		
LFt	63	Last trip	-	same as dEF1 to dEF9		279	-	

(1) Modbus code = Soft starter message
example : oFF on the soft starter will be equivalent to "0" with Modbus protocol (remote command)
* : parameter visible only with Modbus

Parameter Index and Modbus addresses

Code	Page	Name	Unit	Modbus code and Adjustment Range (1)	Description	Modbus address	Factory setting	User setting
LI*		Logical inputs		d0: Input 1. 0 – open, 1 – closed. d1: Input 2. d2: Input 3. d3...d15: Reserved		261		
LI2	60	Logic input 2	-	0 = Strt 1 = rUn 2 = 2nd 3 = EtF 4 = rSt 5 = FAn 6 = FI 7 = LIL	start:for a 3-wire control run:for a 2-wire control 2nd set of parameters external detected fault remote reset fan control trip inhibition forced local command	72	rUn	
LI3	60	Logic input 3	-	2 = 2nd 3 = EtF 4 = rSt 5 = FAn 6 = FI 7 = LIL	2nd set of parameters external detected fault remote reset fan control trip inhibition forced local command	73	rSt	
Lo	47	Logic Output relays status		d0: Relay 1. 0 – not energized, 1 - energized d1: Relay 2 d2...d15: reserved		262		
OIt	57	Overcurrent time delay	s	0 to 50 s	5 with Modbus = 0.5s 50 with Modbus = 5.0s	51	0.5	
OId	56	Overcurrent threshold	% of In	100 to 300, by increment of 5	-	50	200	
OSd	59	Over voltage threshold	% of UIn	110 to 125	-	60	120	
OSt	58	Under voltage time delay	s	I to 10	-	61	2	
PG*		Proportional gain	%	0 to 100%	This parameter is reserved for expert mode. Active when SSC = On	37	60	
PHL	58	Phase loss detection	-	0 = oFF 1 = On	off on	57	On	
PHr	57	Phase sequence	-	0 = 123 1 = 321 2 = oFF	123 321 off	56	oFF	
PtC	59	PTC probes motor monitoring	-	0 = oFF 1 = On	off on	62	oFF	

(1) Modbus code = Soft starter message
example : oFF on the soft starter will be equivalent to "0" with Modbus protocol (remote command)

* : parameter visible only with Modbus

Parameter Index and Modbus addresses

Code	Page	Name	Unit	Modbus code and Adjustment Range (1)	Description	Modbus address	Factory setting	User setting
r 1	61	Relay 1	-	0 = StPd 1 = nStP 2 = Strt 3 = run 4 = rdy 5 = tr IP 6 = ALr	stopped not stopped starting running ready trip alarm	74	nStP	
r 2	61	Relay 2	-	as r 1	as r 1	75	trIP	
rnt	63	Total run time	hours	-	-	273	-	
rPr	64	Reset of trip history and counters	-	-	-	NA	-	
S ICL	63	Last start maximum current	A	0 to 999	-	276	-	
SLG	53	Starts period	min	1 to 60	-	33	30	
Snb	53	Number of starts	-	1 to 10 11 = oFF	Number of starts off	32	oFF	
SPCU	54	Start-stop profile control voltage	-	0 1 2 3	0 1 2 3	36	0	
SSC	54	Start-stop control	-	0 = oFF 1 = On	off on	35	On	
Stnb	63	Total number of starts	-	-	-	274	-	
StPr	63	Last starting time	s	0 to 999	-	275	-	
t90	51	Initial voltage	%	10 to 50% of full voltage, by increment of 5	-	16	30%	
t92	55	2nd initial voltage	%	10 to 50% of full voltage U In, by increment of 5	-	40	30%	

(1) Modbus code = Soft starter message
example : oFF on the soft starter will be equivalent to "0" with Modbus protocol (remote command)

* : parameter visible only with Modbus

Parameter Index and Modbus addresses

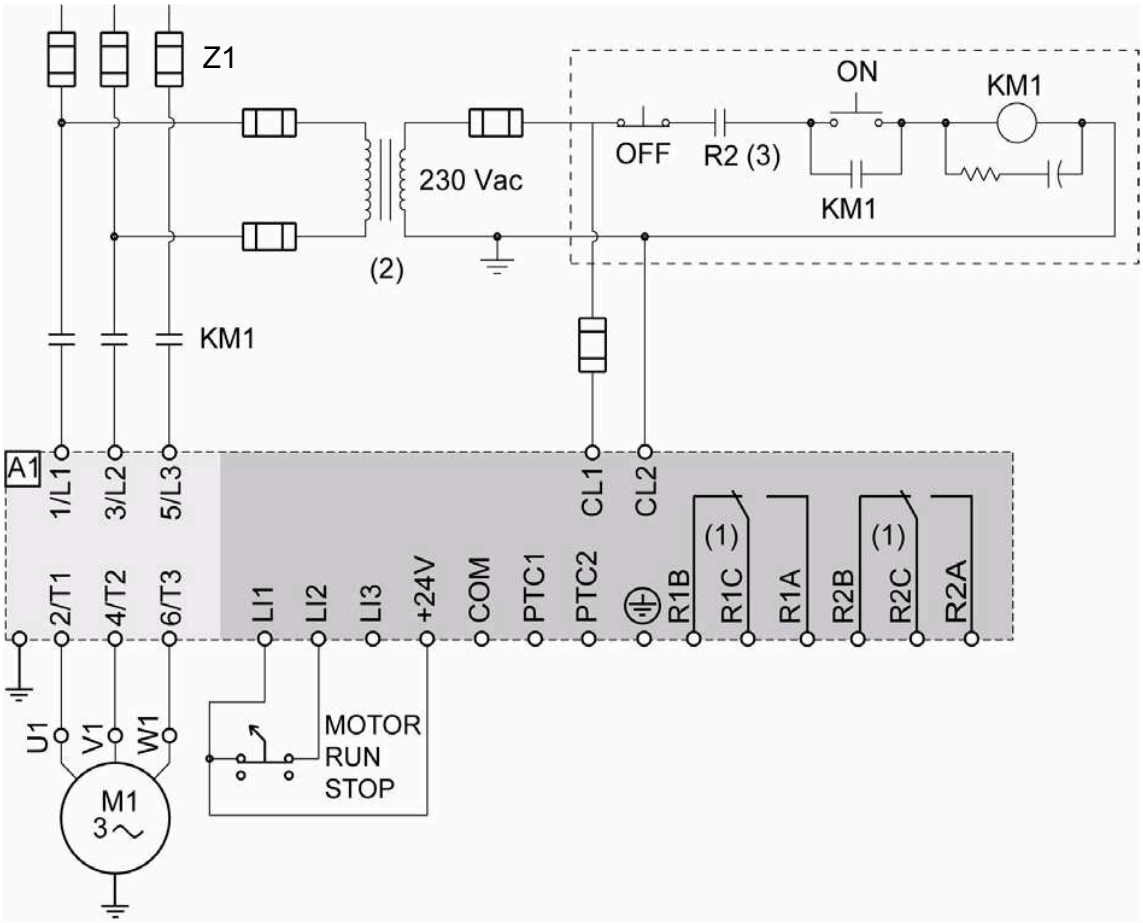
Code	Page	Name	Unit	Modbus code and Adjustment Range (1)	Description	Modbus address	Factory setting	User setting
tbr	62	Modbus baudrate	Kbps	0 = 4.8 1 = 9.6 2 = 19.2	-	81	19.2	
tEST	64	Soft starter self test	-	on off	on off	NA	-	
tHP	52	Motor thermal protection	-	1 = 10 2 = 20 3 = 30	class 10 class 20 class 30 (heavy duty)	22	10	
tLS	51	Max start time	s	1 to 250	-	18	15	
ttO	62	Modbus time out	s	1 = 0.1 to 600 = 60.0	1 with Modbus = 0.1s 600 with Modbus = 60.0s	83	5.0	
Ubd	57	Unbalance threshold	% of In	101 = oFF 10 to 100%	-	52	25	
Ubt	57	Unbalance time delay	s	1 to 60	-	53	10	
UdP	64	Soft starter software version	-	0000 to 9999	-	317		
U Id	56	Under current threshold	% of In	0 = oFF 20 to 90% of In	-	48	oFF	
U In	50	Line voltage	V	Q range: 200 to 440 S6-S6U ranges: 200 to 600	-	2	Q range: 400 S6-S6U ranges: 480	
U It	56	Under current time delay	s	1 to 40	-	49	10	
U Sd	58	Under voltage threshold	% of In	50 to 90% of U In	-	58	70	
U St	58	Under voltage time delay	s	1 to 10	-	59	5	
Voltage*		Voltage	V	Line voltage, volts		260		

(1) Modbus code = Soft starter message
example : oFF on the soft starter will be equivalent to "0" with Modbus protocol (remote command)

* : parameter visible only with Modbus

Annex 1: UL508 schematics

ATS22•••Q or ATS22•••S6: 230 V, 2-wire control, freewheel stop



(1) Check the operating limits of the contact, for example when connecting to high rating contactors. See “Electrical characteristics” page 35.
(2) Insert a voltage transformer if the power voltage is higher than the Altistart 22 acceptable value. Characteristics: min 100 VA page 13.

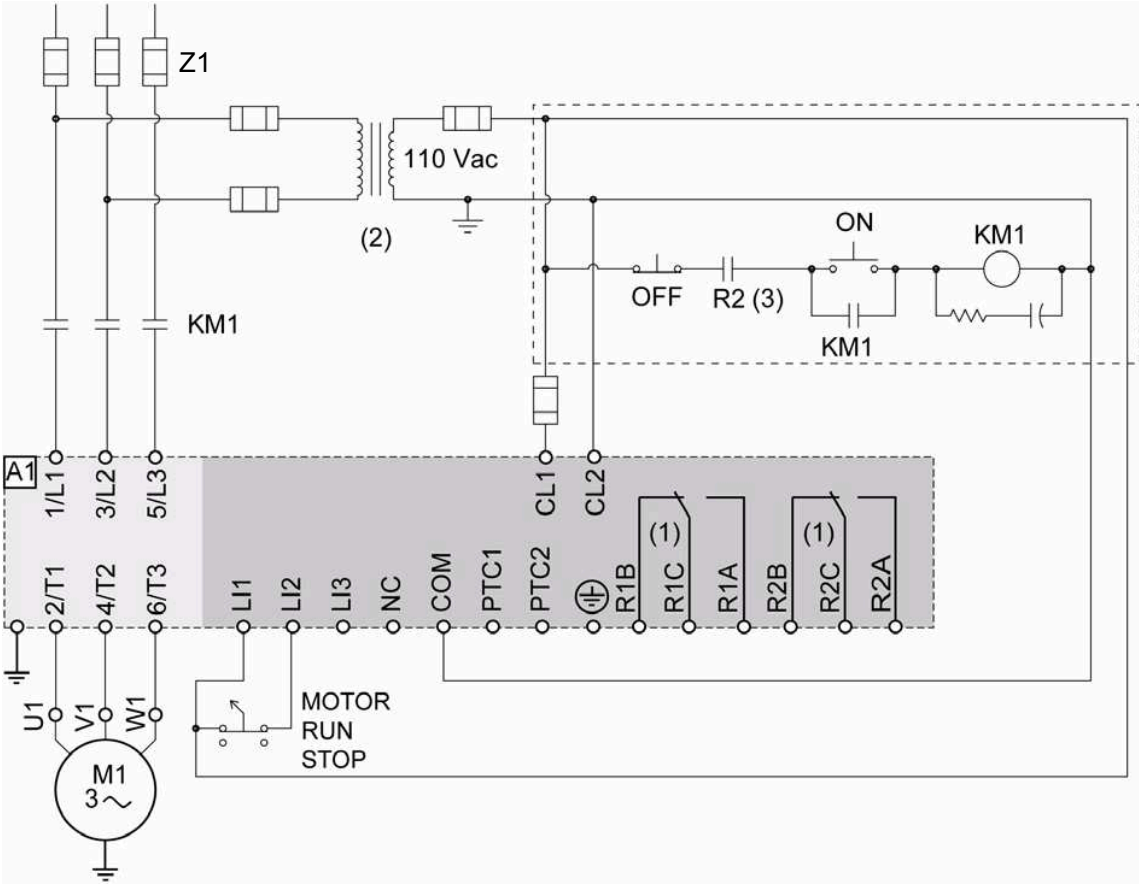
2-wire control setting

In the menu Advanced I/O IO, set the following parameters:

Parameter	Value	Description
LI2	run	Logic Input 2 is set to Run
r2	trIP	Trip relay is de-energized upon trip

Annex 1: UL508 schematics

ATS22•••S6U: 110V, 2-wire control, freewheel stop



(1) Check the operating limits of the contact, for example when connecting to high rating contactors. See “Electrical characteristics” page 36.
(2) Insert a voltage transformer if the power voltage is higher than the Altistart 22 acceptable value. Characteristics: min 100 VA page 13.

2-wire control setting

In the menu Advanced I/O IO, set the following parameters:

Parameter	Value	Description
LI2	run	Logic Input 2 is set to Run
r2	trIP	Trip relay is denergized upon trip