



ST-87x

Compact multi-functional controller
of the Series 8



Series 87x

Variants			ST-87x	ST-87x BLDC	ST-87x-SB	ST-87x-SB BLDC
Controllable axes			1	1	1	1
Performance class	Heat sink	External braking resistor				
0 / up to 0,75 kW / 2,5 A			ST-870	ST-870 BLDC	ST-870-SB	ST-870-SB BLDC
1 / up to 1,5 kW / 4,2 A			ST-871	ST-871 BLDC	ST-871-SB	ST-871-SB BLDC
2 / up to 2,2 kW / 6,0 A	•	•	ST-872		ST-872-SB	
3 / up to 3,0 kW / 8,0 A	•	•	ST-873		ST-873-SB	
Connectable motor types						
DASM Three-phase asynchronous motor		•	•	•	•	•
PMSM Permanent magnet synchron motor		•	•	•	•	•
BLDC Brushless DC motor			•		•	•
Communication						
Half waves		•				
PCM Puls-Code-Modulation		•	•			
SB Railbus				•	•	•
Software			Hard-defined functions / parametrizable			

Type 87x

The compact multi-functional controller ST-87x successfully combines complex technical features and a modern functional design.

The internal controller software stores several typical EMS processes that are easily parameterizable. The EMS processes have been proven in more than 1500 EMS systems worldwide. Therefore an additional development of software is not needed! The customization of your controller is done completely by parameterization.

The parameterization could be done via infrared, via Bluetooth or over the railbus/inductive bus, compatible with previous systems as well.

The implementation of real-time operational data logging and configurable data logging considerably expands and facilitates auxiliary processes such as preventive maintenance and remote service.

Controllers are equipped with a plain-text display which reports status messages and error conditions.



Interfaces

The number of inputs/outputs is fixed for controllers of the 87x series and suffices for all standard and most of special applications, even with sensors such as position measuring systems or distance sensors connected via an RS-485 interface.

- 8 digital inputs (multi-configuration)
- 2 digital outputs
- RS-485 for external devices
- USB for LJU-DataComStick
- Infrared



LJU-DataComStick DCS-8

Communications

Commands are sent over a full-wave/half-wave/PCM/railbus controller, and this is therefore fully compatible with earlier LJU systems as also with a large number of devices from other manufacturers.

- Half waves
- PCM 6/10
- Railbus

The communication method depends on the design of the hardware configuration.

Controllable motor types

The motor control drives both control procedures for classical 3-phase asynchronous motors in all commonly used voltage variants as well as permanent magnet synchronous motors (PMSM) and brush-less DC motors. Jerk-free acceleration curves and a variety of positioning routines provides the customer the perfect solution.



ST-87x – Design

LJU Series 8 controllers are compact designed and for power ranges up to 3 kW for use in the C1 profile. Plugin secured connections and simple service procedures make commissioning, use and diagnosis considerably easier for the user.



Technical Data

Material	Aluminum
Dimensions (W×H×D)	200 × 200 × 90 excl. connector (without heat sink)
Mains voltage	3 × 380 ... 480 Vac ± 10 % / 47 ... 63 Hz
Mains filter	integrated
Power switch	3-phase with thermal overload protection
Inrush current limitation	yes
Ballast-Chopper	Internal Connection for external resistor
Inverter / Switching frequency	IGBT-pulse-controlled inverters / 16 kHz
Motor types	<ul style="list-style-type: none"> Asynchronous synchronous BLDC
Motor rating (Asynchronous motor)	up to 3 kW (3 kW with heat sink)
Operating mode	S3 (Depending on driving profile and cooling)
Motor rated current	up to 6,4 A
Motor maximum current	up to 10,2 A (Acceleration)
Motor brake	<ul style="list-style-type: none"> Brake voltage: 180/216 Vdc (45 % Umains) Brake performance: max. 80 W Electronic fast switching and monitoring
Motor control	<ul style="list-style-type: none"> Vector control with or without encoder (sensorless) (Synchronous / BLDC only with SSI/SPI encoder) U/F characteristic curves
Encoder 1	Quadrature encoder (Feed in: 24 V, signals: 5 V oder 24 V)
Encoder 2 optional (Required for synchronous and BLDC motors)	SSI- / SPI-Encoder (Feed in: 5 V or 24 V, signals: 5 V or RS-485)
Digital outputs	2 (24 V / 0,5 A)
Digital inputs	up to 8
USB interface for external Data-Com-Stick	Parameterization, Log-Files, etc.
BUS for external components by LJU	LJU BUS (RS-485)
Command system	Half wave, PCM 10, PCM 6, LJU railbus
Indicator	Plain-text display
Protection	IP54
Temperature running	+10°C up to +50°C
Temperature storage	-10°C up to +60°C
Relative humidity	< 80 % non-condensing

Connectable sensors

	Selection of standard functions	Remarks
Magnetic Switch (3 pieces)	<ul style="list-style-type: none"> • Switch open/closed – Reduction of speed to V6/V7/V8 • Switch open/closed – Half speed • Switch closed – No drive command – brake open • Switch closed – Motor stopped – brake open • Disabled with synchronous drive Additional functions to be parametrized	PCM PCM PCM PCM
Light Barrier (2 pieces)	<ul style="list-style-type: none"> • Switch open/closed – Reduction of speed to V9 • Switch open/closed – Half speed • Switch closed – No drive command – brake open • Switch closed – Motor stopped – brake open • Disabled with synchronous drive • Additional functions to be parametrized 	PCM PCM PCM PCM
Anti-collision initiator (1 piece)	<ul style="list-style-type: none"> • Vehicle stops – restart after timer is elapsed • Error message to be parametrized • Disabled – when driving backwards • Disabled – when driving forward • Disabled – with synchronous drive - selectable • Non-equivalent control Several combinations possible	PCM SB Railbus PCM SB Railbus PCM SB Railbus PCM SB Railbus PCM SB Railbus PCM SB Railbus
Sequence stop	<ul style="list-style-type: none"> • Switch locked/pushed No error message 	Sequence stop switch free configurable
Operation stop	<ul style="list-style-type: none"> • Switch locked/pushed Error message 	Error reset
Positioning	Various systems possible 2 x Initiator on the vehicle (Self positioning with backwards driving) <ul style="list-style-type: none"> • OLM-708 with Barcode (Self positioning with backwards driving) • PLA-140 / PLA-14 with Code Rail (Self positioning with backwards driving) 	Dependent on drive direction
Track detection	DLS-2b – synchronized speed monitoring PLA-140 / PLA-14 OLM-708	Not with BUS System

Features

Synchronized speed	PCM – DLS PLS OLM SB Railbus – PLA OLM
Parameterization	PCM Infrared (MU+LBS) USB (LJU-DataComStick DCS 8.0) SB Railbus Infrared Bus USB (LJU-DataComStick DCS 8.0)
Parameterization ramps	<ul style="list-style-type: none"> • S-Curve <ul style="list-style-type: none"> • J1mx – Jerk Limitation at beginning of acceleration • J2mx – Jerk Limitation at end of acceleration • J3mx – Jerk Limitation at beginning of braking • J4mx – Jerk Limitation at end of braking <p>The jerk limitation enables a smooth transition between areas of linear speed, acceleration and deceleration. 4 Parameters are able to be set.</p> <ul style="list-style-type: none"> • Linear
Parameter identification	Automatic Motor identification
Speeds	PCM 16 speeds + additive speed in synchronous area – 170 speed steps SB Railbus 32 speeds (16× Synchron, 16× Asynchron)
Distance control	PCM 5 areas (slow/stop) switched over: <ul style="list-style-type: none"> • PCM-command with SENSOPART FR 85 • Input signal (Magnetic switch) SB Railbus – 16 Indices, segment related to be parametrized
Monitoring (Selection)	<ul style="list-style-type: none"> • Input voltage (Phase detection) • Motor current (Start, nominal current, module limits) • Temperature Frequency inverter and Motor (PTC) • Plausibility • Input – Output status • Position
Commands Sinus Wave	<ul style="list-style-type: none"> • Half Wave 230 or 400 V • Z-Stop for Block Control 400 V • PCM 10: 192 commands • PCM 6: 16 commands • Functions of the PCM commands to be parametrized (Synchron, Ascent, Descent, Position etc.) • 50 or 60 Hz net with the same hardware • Message over command rail with 3 different types of sine wave (positive and negative half wave, full wave)
Commands with BUS	<ul style="list-style-type: none"> • Control 2 command bytes (16 Bits for commands) Outputs • Feedback – 4 status bytes: Position absolute + Segment number (length of telegram fixed) + Input status
Parameter sets	<ul style="list-style-type: none"> • Horizontal asynchron • Horizontal synchron • Ascend • Descend • Positioning / min speeds
Display	Plain-text display max. 255 Status informations 4 free configurable information's at once Error messages in clear text (german, englisch) Automatic switch of error message over three lines and in the fourth line with clear text info!
Manual mode	Infrared or Bluetooth with LJU-DataComStick DCS 8.0
Firmware update	Infrared or USB with LJU-DataComStick DCS 8.0

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