Manual

INSYS icom

Industrial Data Communication

LSX

Installation Manual

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1 Preface

This manual allows for the safe and efficient use of the product. The manual is part of the product and must always be stored accessible for installation, commissioning and operating personnel.

1.1 Defects Liability Terms

A usage not according to the intended purpose, an ignorance of this documentation, the use of insufficiently qualified personnel as well as unauthorised modifications exclude the liability of the manufacturer for damages resulting from this. The liability of the manufacturer ceases to exist.

The regulations of our Delivery and Purchasing Conditions are effective. These can be found on our website (www.insys-icom.de/imprint/) under “General Terms and Conditions“.

1.2 Feedback

We are permanently improving our products and the associated technical documentation. Your feedback is very helpful for this. Please tell us what you like in particular on our products and publications and what can be improved from your point of view. We highly appreciate your suggestions and will include them in our work to support you and all our customers. We are looking forward to any of your feedback.

Please send an e-mail to support@insys-tec.de.

We'd like to know your applications. Please send us a few headwords that we know the applications you solve using products of INSYS icom.

1.3 Marking of Warnings and Notes

Symbols and Key Words

Danger!

Risk of severe or fatal injury

One of these symbols in conjunction with the key word Danger indicates an imminent danger. It will cause death or severe injuries if not avoided.

Warning!

Personal injury

This symbol in conjunction with the key word Warning indicates a possibly hazardous situation. It might cause death or severe injuries if not avoided.

Caution!

Slight injury and / or material damage

This symbol in conjunction with the key word Caution indicates a possibly hazardous or harmful situation. It might cause slight or minor injuries or a damage of the product or something in its vicinity if not avoided.

Note

Improvement of the application

This symbol in conjunction with the key word Note indicates hints for the user or very useful information. This information helps with installation, set-up and operation of the product to ensure a fault-free operation.

1.4 Symbols and the Formatting in this Manual

This section describes the definition, formatting and symbols used in this manual. The various symbols are meant to help you read and find the information relevant to you. The following text is structured like a typical operating instruction of this manual.

Bold print: This will tell you what the following steps will result in

After that, there will be a detailed explanation why you could perform the following steps to be able to reach the objective indicated first. You can decide whether the section is relevant for you or not.

⇢ An arrow will indicate prerequisites which must be fulfilled to be able to process the subsequent steps in a meaningful way. You will also learn which software or which equipment you will need.

1. ***One individual action step: This tells you what you need to do at this point. The steps are numbered for better orientation.***

   ✓ A result which you will receive after performing a step will be marked with a check mark. At this point, you can check if the previous steps were successful.

   ⓘ Additional information which you should consider are marked with a circled "i". At this point, we will indicate possible error sources and tell you how to avoid them.

   ➢ *Alternative results and steps are marked with an arrow. This will tell you how to reach the same results performing different steps, or what you could do if you didn't reach the expected results at this point.*

2 Safety

The Safety section provides an overview about the safety instructions, which must be observed for the operation of the product.

The product is constructed according to the currently valid state-of-the-art technology and reliable in operation. It has been checked and left the factory in flawless condition concerning safety. In order to maintain this condition during the service life, the instructions of the valid publications and certificates must be observed and followed.

It is necessary to adhere to the general safety instructions must when operating the product. The descriptions of processes and operation procedures are provided with precise safety instructions in the respective sections in addition to the general safety instructions.

Moreover, the local accident prevention regulations and general safety regulations for the operating conditions of the device are effective.

An optimum protection of the personnel and the environment from hazards as well as a safe and fault-free operation of the product is only possible if all safety instructions are observed.

2.1 Intended Use

The product may only be used for the purposes specified in the function overview. In addition, it may be used for the following purposes:

- Usage and installation as controller in an AC charging station or AC wall box for electric vehicles

The product may **not** be used for the following purposes and used or operated under the following conditions:

- Controlling or switching of machines and systems, which do not comply with the directive 2006/42/EC.
- Usage, controlling, switching and data transmission of machines and systems, which are operated in explosive atmospheres.
- Controlling, switching and data transmission of machines, which may involve risks to life and limb due to their functions or when a breakdown occurs.

2.2 Permissible Technical Limits

The product is only intended for the use within the permissible technical limits specified in the data sheets.

The following permissible limits must be observed:

- The ambient temperature limits must not be fallen below or exceeded.
- The supply voltage range must not be fallen below or exceeded.
- The maximum humidity must not be exceeded and condensate formation must be prevented.
- The maximum switching voltage and the maximum switching current load must not be exceeded.
- The maximum input voltage and the maximum input current must not be exceeded.

2.3 Responsibilities of the Operator

As a matter of principle, the operator must observe the legal regulations, which are valid in his country, concerning operation, functional test, repair and maintenance of electrical devices.

2.4 Qualification of the Personnel

The installation, commissioning and maintenance of the product must only be performed by trained expert personnel, which has been authorised by the plant operator. The expert personnel must have read and understood this documentation and observe the instructions.

Electrical connection and commissioning must only be performed by a person, who is able to work on electrical installations and identify and avoid possible hazards independently, based on professional training, knowledge and experience as well as knowledge of the relevant standards and regulations.

2.5 Instructions for Transport and Storage

The following instructions must be observed:

- Do not expose the product to moisture and other potential hazardous environmental conditions (radiation, gases, etc.) during transport and storage. Pack product accordingly.
- Pack product sufficiently to protect it against shocks during transport and storage, e.g. using air-cushioned packing material.

Check product for possible damages, which might have been caused by improper transport, before installation. Transport damages must be noted down to the shipping documents. All claims or damages must be filed immediately and before installation against the carrier or party responsible for the storage.

2.6 Markings on the Product

The identification plate of the product is either a print or a label on a face of the product. Amongst other things, it can contain the following markings, which are explained in detail here.

Observe manual

This symbol indicates that the manual of the product contains essential safety instructions that must be followed implicitly.

Dispose waste electronic equipment environmentally compatible

This symbol indicates that waste electronic equipment must be disposed separately from residual waste via appropriate collecting points. See also Section Disposal in this manual.

CE marking

By applying a CE marking, the manufacturer confirms that the product complies with the European directives that apply product-specific.

UL marking

By applying a UL marking, the manufacturer confirms that the product complies with the obligatory safety requirements.

Appliance Class II - double insulated

This symbol indicates that the product complies with Appliance Class II

2.7 Environmental Protection

Dispose the product and the packaging according to the relevant environmental protection regulations. The Waste Disposal section in this manual contains notes about disposing the product. Separate the packaging components of cardboard and paper as well as plastic and deliver them to the respective collection systems for recycling.

2.8 Safety Instructions for Electrical Installation

The electrical connection must only be made by authorised expert personnel according to the wiring diagrams.

The notes to the electrical connection in the manual must be observed. Otherwise, the protection category might be affected.

The safe disconnection of circuits, which are hazardous when touched, is only ensured if the connected devices meet the requirements of VDE T.101 (Basic requirements for safe disconnection).

The supply lines are to be routed apart from circuits, which are hazardous when touched, or isolated additionally for a safe disconnection.

An easily accessible isolation device that disconnects all lines must be installed prior to commissioning of the device to be able to isolate it completely from power supply.

2.9 General Safety Instructions

Caution!

Electrostatic discharges may damage the product!

Damage of the product.

Observe the general safety precautions when handling electrostatic-discharge-sensitive parts.

Caution!

Incomplete voltage isolation!

Damage of the product.

To isolate the voltage from the device, disconnect **any** supply circuit with its respective isolation device if a redundant power supply is used.

Caution!

Moisture and liquids from the environment may seep into the interior of the product!

Fire hazard and damage of the product.

The product must not be used in wet or damp environments, or in the direct vicinity of water. Install the product at a dry location, protected from water spray. Disconnect the power supply before you perform any work on a device which may have been in contact with moisture.

Caution!

Short circuits and damage due to improper repairs and modifications as well as opening of maintenance areas!

Fire hazard and damage of the product.

It is not permitted to open the product for repair or modification exceeding the removal or installation of the designated plug-in cards.

Caution!

Overvoltage and voltage peaks from the mains supply!

Fire hazard and damage of the product due to overvoltage.

Install suitable overvoltage protection.

Caution!

Damage due to chemicals!

Ketones and chlorinated hydrocarbons dissolve the plastic housing and damage the surface of the device.

Never let the device come into contact with ketones (e.g. acetone) or chlorinated hydrocarbons, such as dichloromethane.

Caution!

Distance from antennas to persons!

A too low distance from cellular antennas to persons can affect the health.

Please observe to keep a minimum distance of 20 cm between the cellular antenna and persons during operation.

ⓘ Important note for installations in Sweden or Norway:
Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan I visa fall medföra risk fr brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet.

3 Using Open Source Software

3.1 General Information

Our product LSX contains, amongst others, so-called open-source software that is provided by third parties and has been published for free public use. The open-source software is subject to special open-source software licenses and the copyright of third parties. Basically, each customer can use the open-source software freely in compliance with the licensing terms of the respective producers. The rights of the customer to use the open-source software beyond the purpose of our product are regulated in detail by the respective concerned open-source software licenses. The customer use the open-source software freely, as provided in the respective effective license, beyond the purpose that the open-source software gets in our product. In case there is a contradiction between the licensing terms for our product and the respective open-source software license, the respective relevant open-source software license takes priority over our licensing terms, as far as the respective open-source software is concerned by this.

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All open-source software programs contained in our product can be taken from the available list. The most important open-source software licenses are listed in the Licenses section at the end of this publication.

As far as programs contained in our product are subject to the GNU General Public License (GPL), GNU Lesser General Public License (LGPL), Clarified Artistic License or another open-source software license, which regulates that the source code must be made available, and if this software is not already delivered in source code on a data carrier with our product, we will send you this at any time upon request. If it is required to send this on a data carrier, the sending will be made against payment of a cost compensation of € 10,00. Our offer to send the source code upon request ceases automatically 3 years after delivery of our product to the customer. Requests must be directed to the following address, if possible under specification of the serial number:

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Fax +49 941 58692 45

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3.2 Special Liability Regulations

We do not assume any warranty or liability, if the open-source software programs contained in our product are used by the customer in a manner that does not comply any more with the purpose of the contract, which is the basis of the acquisition of our product. This concerns in particular any use of the open-source software programs outside of our product. The warranty and liability regulations that are provided by the respective effective open-source software license for the respective open-source software as listed in the following are effective for the use of the open-source software beyond the purpose of the contract. In particular, we are not liable, if the open-source software in our product or the complete software configuration in our product is changed. The warranty granted with the contract, which is the basis of the acquisition of our product, is only effective for the unchanged open-source software and the unchanged software configuration in our product.

3.3 Used Open-Source Software

Please contact our support department (support@insys-icom.de) for a list of the open-source software used in this product.

4 Technical Information

All specified data was measured with an input voltage of 12 V, at full load, and an ambient temperature of 25 °C. The limit value tolerances are subject to the usual variations.

4.1 Ambient conditions

Property	Value
Temperature range	-30 °C ... 65 °C
Maximum permissible humidity	95% non-condensing

Table 1: Technical Information - ambient conditions

4.2 Housing

The housing is to be mounted horizontally to a DIN rail. Thermal conditions must be considered.

Property	Value
Weight	380 g
Dimensions (width x height x depth)	161 mm x 91 mm x 62 mm without connectors, plugs and DIN rail clip
IP rating	Housing IP30 Connector IP20

Table 2: Technical Information - housing

4.3 Connections

4.3.1 X1 – Smart card holder

The smart card will be inserted in holder X1. It will be ejected by pressing with a pointed tool (e.g. ball pen). There is no protection against removal of an inserted card.

Property	Value
Format	ISO 7816 ID-000 (25x15 mm) conforms to Mini-SIM (2FF) locked

Table 3: Technical Information – smart card holder

4.3.2 X2 – SIM card holder

The SIM card will be inserted in holder X2. It will be ejected by pressing with a pointed tool (e.g. ball pen). There is no protection against removal of an inserted card.

Property	Value
Supports	1.8 V and 3.0 V SIM cards
Format	Mini-SIM (2FF) locked

Table 4: Technical Information – SIM card holder

4.3.3 X3 – Meter interface 1 (Meter 1)

Connection of the meter Meter 1 takes place using socket X3.

Property	Value
Type	RJ12 (6p6c) unshielded not isolated
RS232	Max. baud rate 115.200 bit/s Level according to V.28
RS485	Max. baud rate 921.600 bit/s Level according to EIA 485

Table 5: Technical Information – Meter interface 1 (Meter 1)

Terminal	Signal	Description
1	RS485+	RS485 Data -
2	Supply	Power supply
3	GND	GND (ground)
4	RS232 TxD	RS232 TxD (output)
5	RS232 RxD	RS232 RxD (input)
6	RS485+	RS485 Data +

Table 6: Terminal X3 – Meter interface 1 (Meter 1)

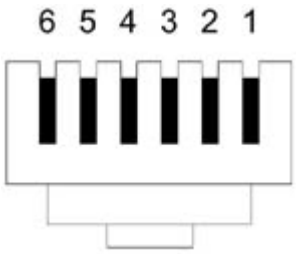

Figure 1: Terminal X3 – Meter interface 1 (Meter 1) (view on plug)

4.3.4 X4 – Meter interface 2 (Meter 2)

Connection of the meter Meter 2 takes place using socket X4.

Property	Value
Type	RJ12 (6p6c) unshielded not isolated
RS232	Max. baud rate 115.200 bit/s Level according to V.28
RS485	Max. baud rate 921.600 bit/s Level according to EIA 485

Table 7: Technical Information – Meter interface 2 (Meter 2)

Terminal	Signal	Description
1	RS485+	RS485 Data -
2	Supply	Power supply
3	GND	GND (ground)
4	RS232 TxD	RS232 TxD (output)
5	RS232 RxD	RS232 RxD (input)
6	RS485+	RS485 Data +

Table 8: Terminal X4 – Meter interface 2 (Meter 2)

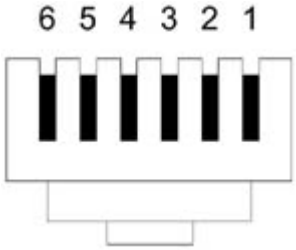

Figure 2: Terminal X4 – Meter interface 2 (Meter 2) (view on plug)

4.3.5 X5 – Digital outputs

Connection of the digital outputs takes place using connector X5. The digital outputs comprise isolated outputs and contact outputs that switch to GND.

Property	Value
Execution	Transistor
Switch current	max. 20 mA
Switch voltage	max. 30 V
Voltage drop in ON condition	< 1.5 V at 20 mA

Table 9: Technical Information – Isolated outputs

Property	Value
Execution	Open-drain
Continuous current	max. 0.5 A
Short-time current (<1 s)	5 A
Electric strength	30 V

Table 10: Technical Information - Contact outputs

Terminal	Signal	Description
1	DO1+	Isolated output 1, +
2	DO1-	Isolated output 1, -
3	DO2+	Isolated output 2, +
4	DO2-	Isolated output 2, -
5	CO1	Contact output 1 (switches to GND)
6	CO2	Contact output 2 (switches to GND)

Table 11: Terminal X5 – Digital outputs

Wire	Cross-section
Nominal cross-section	1.5 mm²
Rigid	0.2 – 1.5 mm²
Flexible	0.2 – 1.5 mm²
Flexible with end sleeve	0.25 – 1.5 mm²

Table 12: Terminal X5 – Permissible wire cross-sections

4.3.6 X6 – Digital / analogue inputs

Connection of the digital and analogue inputs takes place using connector X6. The digital inputs comprise isolated inputs and contact inputs.

Property	Value
Execution	Optoelectronic coupler
LOW level	< 4 V DC
HIGH level	10 … 30 V DC
Input current	max. 2 mA at 30 V DC

Table 13: Technical Information – Isolated inputs

Property	Value
Execution	Contact to GND
Power supply	internal pull-up resistor 10 kOhm at 3.3 V DC
LOW level	0 … 0.5 V DC
HIGH level	1.5 … 3.3 V DC
External voltage resistance	-5 … 30 V DC

Table 14: Technical Information - Contact inputs

Property	Value
Execution	Analogue
Voltage range	0 … 10 V DC
Accuracy	+/-3%
Resolution	10 bit
Input resistance	approx. 30 kOhm
External voltage resistance	-5 … 30 V DC

Table 15: Technical Information - Analogue inputs

Terminal	Signal	Description
1	DI1+	Isolated input 1, +
2	DI1-	Isolated input 1, -
3	DI2+	Isolated input 2, +
4	DI2-	Isolated input 2, -
5	CI1	Contact input 1 (contact to GND)
6	CI2	Contact input 2 (contact to GND)
7	AGND	Reference potential for analogue inputs
8	AI1	Analogue input 1
9	AI2	Analogue input 2
10	AI3	Analogue input 3

Table 16: Terminal X6 – Digital / analogue inputs

Wire	Cross-section
Nominal cross-section	1.5 mm²
Rigid	0.2 – 1.5 mm²
Flexible	0.2 – 1.5 mm²
Flexible with end sleeve	0.25 – 1.5 mm²

Table 17: Terminal X6 – Permissible wire cross-sections

4.3.7 X7 – Relay outputs

Connection of the relay outputs takes place using connector X7.

Property	Value
Execution	Relay, monostable
Switching capacity NO	max. 3 A / 30 V DC
Switching capacity NC	max. 2 A / 30 V DC
Minimum contact load	5 V / 100 mA

Table 18: Technical Information – Relay outputs

Terminal	Signal	Description
1	OUT1-NC	Relay 1, normally closed (NC)
2	OUT1	Relay 1, center contact
3	OUT1-NO	Relay 1, normally open (NO)
4	OUT2-NC	Relay 2, normally closed (NC)
5	OUT2	Relay 2, center contact
6	OUT2-NO	Relay 2, normally open (NO)

Table 19: Terminal X7 – Relay outputs

Wire	Cross-section
Nominal cross-section	1.5 mm²
Rigid	0.2 – 1.5 mm²
Flexible	0.2 – 1.5 mm²
Flexible with end sleeve	0.25 – 1.5 mm²

Table 20: Terminal X7 – Permissible wire cross-sections

4.3.8 X8 – GPS antenna

Connection of the GPS antenna takes place using connector X8.

Property	Value
Type	SMA
Phantom power	approx. 4 V / 50 mA

Table 21: Technical Information – GPS antenna connection

4.3.9 X9 – Cellular antenna

Connection of the cellular antenna takes place using connector X9.

Property	Value
Type	SMA

Table 22: Technical Information – Cellular antenna connection

4.3.10 X10 – Serial interface 3

Connection of the serial interface 3 takes place using socket X10. Serial interface 3 has two independent RS232 interfaces that are directly connected to the CPU.

Property	Value
Type	RJ12 (6p6c) unshielded not isolated
RS232	Max. baud rate 115.200 bit/s Level according to V.28

Table 23: Technical Information – Serial interface 3

Terminal	Signal	Description
1	RS232 TxD 1	RS232 TxD (output) 1
2	RS232 RxD 1	RS232 RxD (input) 1
3	GND	GND (ground)
4	RS232 TxD 2	RS232 TxD (output) 2
5	RS232 RxD 2	RS232 RxD (input) 2
6	GND	GND (ground)

Table 24: Terminal X10 – Serial interface 3

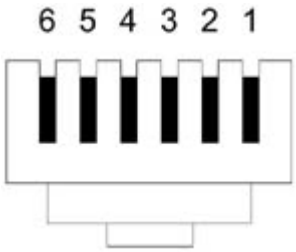

Figure 3: Terminal X10 – Serial interface 3 (view on plug)

4.3.11 X12 – WLAN antenna

Connection of the WLAN antenna takes place using connector X12.

Property	Value
Type	Reverse SMA

Table 25: Technical Information – WLAN antenna connection

4.3.12 X13 – Ethernet interface

The Ethernet interface is on Ethernet connection X13. Ethernet connection X13 comprises 2 Ethernet interfaces, Ethernet interface X13a and the 3-port switch X13b.

Property	Value
Type	4x RJ45 shielded
Ethernet	10/100 Mbit/s full/half duplex auto sense; automatic detection of "crossover" or "patch" wiring.

Table 26: Technical Information – Ethernet interface

4.3.13 X14 – Power supply

Connection of the power supply takes place using connector X14.

Property	Value
Operating voltage	12 V … 24 V DC (±20%)
Power consumption	< 15 W under full load < 6 W under reduced operation (idle)
IP rating	Housing IP30, connector IP20

Table 27: Technical Information – Power supply

Terminal	Signal	Description
1	-	Ground
2	+	Power supply

Table 28: Terminal X14 – Power supply

Wire	Cross-section
Nominal cross-section	2.5 mm²
Rigid	0.2 – 2.5 mm²
Flexible	0.2 – 2.5 mm²
Flexible with end sleeve	0.25 – 2.5 mm²

Table 29: Terminal X14 – Permissible wire cross-sections

According to the requirement of IEC 61851 (Ed. 3 CDV), voltages (ELV) between EVSE and EV must be isolated from the grid using transformers that comply with the requirements according to IEC 61558-1 and -2-4. This must apply to the supplying power supply unit in the charging station. Use limited power source (LPS) acc. UL/IEC 60950-1 or UL/IEC 62368-1 only.

4.3.14 X15 – GFI connection charging point 1

GFI connection for charging point 1 takes place using socket X15.

Property	Value
Socket	Molex MicroFit 43045-0601

Table 30: Technical Information – GFI connection charging point 1

Property	Value
Signal	GFI_Preset
Execution	Open collector output (to GND)
Load	max. 12 V DC at 25 mA
Voltage drop condition 1	max. 1 V DC at 10 mA
Leakage current condition 0	> 50 mA

Table 31: Technical Information – GFI connection charging point 1 – GFI_Preset

Property	Value
Signal	GFI_Activate
Execution	Open collector output (to GND)
Load	max. 12 V DC at 25 mA
Voltage drop condition 1	max. 1 V DC at 10 mA
Leakage current condition 0	> 50 mA

Table 32: Technical Information – GFI connection charging point 1 – GFI_Activate

Property	Value
Signal	GFI_Status
Execution	Contact input (to GND)
Load external driver/contact	max. 12 V DC at 10 mA
HIGH level	>= 1.5 V DC
Leakage current condition 0	> 50 µA

Table 33: Technical Information – GFI connection charging point 1 – GFI_Status

Property	Value
Signal	GFI_Welding
Execution	Contact input (to GND)
Load external driver/contact	max. 12 V DC at 10 mA
HIGH level	>= 1.5 V DC
Leakage current condition 0	> 50 µA

Table 34: Technical Information – GFI connection charging point 1 – GFI_Welding

Property	Value
Signal	GFI_VoltageMonitor
Execution	Contact input (to GND)
Load external driver/contact	max. 12 V DC at 10 mA
HIGH level	>= 1.5 V DC
Leakage current condition 0	> 50 µA

Table 35: Technical Information – GFI connection charging point 1 – GFI_VoltageMonitor

Terminal	Signal	Description
1		GFI_Preset (OUT)
2	GND	GND (ground)
3		GFI_Activate (OUT)
4		GFI_Status (IN)
5		GFI_Welding (IN)
6		GFI_VoltageMonitor (IN)

Table 36: Terminal X15 – GFI connection charging point 1

4.3.15 X16 – Connection charging point 1

Connection for charging point 1 takes place using socket X16.

Property	Value
Signal	Interlock feedback
Execution	Contact input (to GND)
Power supply	internal pull-up resistor 10 kOhm at 15 V DC
LOW level	0 … 1.5 V DC
HIGH level	4.5 … 15 V DC
External voltage resistance	-5 … 30 V DC

Table 37: Technical Information – Connection charging point 1 – Interlock feedback

Property	Value
Signal	Voltage monitor
Execution	Contact input (to GND)
Power supply	internal pull-up resistor 10 kOhm at 5 V DC
LOW level	0 … 1 V DC
HIGH level	3.5 … 5 V DC
External voltage resistance	-5 … 30 V DC

Table 38: Technical Information – Connection charging point 1 – Voltage monitor

Property	Value
Signal	Proximity
Execution	Analogue input
Voltage range	0 … 5 V DC
Accuracy	+/-5%
Resolution	10 bit
External voltage resistance	0 … 5 V DC or max. 100 mA

Table 39: Technical Information – Connection charging point 1 – Proximity

Property	Value
Signal	Contactor
Execution	Open drain output (to GND)
Continuous current	max. 1 A
Short-time current (<1 s)	5 A
Electric strength	30 V

Table 40: Technical Information – Connection charging point 1 – Contactor

Property	Value
Signal	Operating current trigger
Execution	Open drain output (to GND)
Continuous current	max. 1 A
Short-time current (<1 s)	5 A
Electric strength	30 V

Table 41: Technical Information – Connection charging point 1 – Operating current trigger

Property	Value
Signal	Interlock
Execution	Relay, monostable
Switching capacity NO	max. 3 A / 30 V DC
Switching capacity NC	max. 2 A / 30 V DC
Minimum contact load	5 V / 100 mA

Table 42: Technical Information – Connection charging point 1 – Interlock

Property	Value
Signal	PT1000
Execution	2-wire
Accuracy	+/-5°C

Table 43: Technical Information – Connection charging point 1 – PT1000

Terminal	Signal	Description
1		Interlock feedback (IN)
2		Voltage monitor (IN)
3		Control pilot -
4		Control pilot +
5		Proximity (IN)
6		Contactor (OUT), switches to GND
7		Operating current trigger (OUT), switches to GND
8		Interlock, relay, normally open contact (NO)
9		Interlock, relay, center contact
10		Interlock, relay, normally closed contact (NC)
11		PT1000 - (GND)
12		PT1000 +

Table 44: Terminal X16 – Connection charging point 1

Wire	Cross-section
Nominal cross-section	1.5 mm²
Rigid	0.2 – 1.5 mm²
Flexible	0.2 – 1.5 mm²
Flexible with end sleeve	0.25 – 1.5 mm²

Table 45: Terminal X16 – Permissible wire cross-sections

4.3.16 X17 – GFI connection charging point 2

GFI connection for charging point 2 takes place using socket X17.

Property	Value
Socket	Molex MicroFit 43045-0601

Table 46: Technical Information – GFI connection charging point 2

Property	Value
Signal	GFI_Preset
Execution	Open collector output (to GND)
Load	max. 12 V DC at 25 mA
Voltage drop condition 1	max. 1 V DC at 10 mA
Leakage current condition 0	> 50 mA

Table 47: Technical Information – GFI connection charging point 2 – GFI_Preset

Property	Value
Signal	GFI_Activate
Execution	Open collector output (to GND)
Load	max. 12 V DC at 25 mA
Voltage drop condition 1	max. 1 V DC at 10 mA
Leakage current condition 0	> 50 mA

Table 48: Technical Information – GFI connection charging point 2 – GFI_Activate

Property	Value
Signal	GFI_Status
Execution	Contact input (to GND)
Load external driver/contact	max. 12 V DC at 10 mA
HIGH level	>= 1.5 V DC
Leakage current condition 0	> 50 µA

Table 49: Technical Information – GFI connection charging point 2 – GFI_Status

Property	Value
Signal	GFI_Welding
Execution	Contact input (to GND)
Load external driver/contact	max. 12 V DC at 10 mA
HIGH level	>= 1.5 V DC
Leakage current condition 0	> 50 µA

Table 50: Technical Information – GFI connection charging point 2 – GFI_Welding

Property	Value
Signal	GFI_VoltageMonitor
Execution	Contact input (to GND)
Load external driver/contact	max. 12 V DC at 10 mA
HIGH level	>= 1.5 V DC
Leakage current condition 0	> 50 µA

Table 51: Technical Information – GFI connection charging point 2 – GFI_VoltageMonitor

Terminal	Signal	Description
1		GFI_Preset (OUT)
2	GND	GND (ground)
3		GFI_Activate (OUT)
4		GFI_Status (IN)
5		GFI_Welding (IN)
6		GFI_VoltageMonitor (IN)

Table 52: Terminal X17 – GFI connection charging point 2

4.3.17 X18 – Connection charging point 1

Connection for charging point 1 takes place using socket X18.

Property	Value
Signal	Interlock feedback
Execution	Contact input (to GND)
Power supply	internal pull-up resistor 10 kOhm at 15 V DC
LOW level	0 … 1.5 V DC
HIGH level	4.5 … 15 V DC
External voltage resistance	-5 … 30 V DC

Table 53: Technical Information – Connection charging point 2 – Interlock feedback

Property	Value
Signal	Voltage monitor
Execution	Contact input (to GND)
Power supply	internal pull-up resistor 10 kOhm at 5 V DC
LOW level	0 … 1 V DC
HIGH level	3.5 … 5 V DC
External voltage resistance	-5 … 30 V DC

Table 54: Technical Information – Connection charging point 2 – Voltage monitor

Property	Value
Signal	Proximity
Execution	Analogue input
Voltage range	0 … 5 V DC
Accuracy	+/-5%
Resolution	10 bit
External voltage resistance	0 … 5 V DC or max. 100 mA

Table 55: Technical Information – Connection charging point 2 – Proximity

Property	Value
Signal	Contactor
Execution	Open drain output (to GND)
Continuous current	max. 1 A
Short-time current (<1 s)	5 A
Electric strength	30 V

Table 56: Technical Information – Connection charging point 2 – Contactor

Property	Value
Signal	Operating current trigger
Execution	Open drain output (to GND)
Continuous current	max. 1 A
Short-time current (<1 s)	5 A
Electric strength	30 V

Table 57: Technical Information – Connection charging point 2 – Operating current trigger

Property	Value
Signal	Interlock
Execution	Relay, monostable
Switching capacity NO	max. 3 A / 30 V DC
Switching capacity NC	max. 2 A / 30 V DC
Minimum contact load	5 V / 100 mA

Table 58: Technical Information – Connection charging point 2 – Interlock

Property	Value
Signal	PT1000
Execution	2-wire
Accuracy	+/-5°C

Table 59: Technical Information – Connection charging point 2 – PT1000

Terminal	Signal	Description
1		Interlock feedback (IN)
2		Voltage monitor (IN)
3		Control pilot -
4		Control pilot +
5		Proximity (IN)
6		Contactor (OUT), switches to GND
7		Operating current trigger (OUT), switches to GND
8		Interlock, relay, normally open contact (NO)
9		Interlock, relay, center contact
10		Interlock, relay, normally closed contact (NC)
11		PT1000 - (GND)
12		PT1000 +

Table 60: Terminal X18 – Connection charging point 2

Wire	Cross-section
Nominal cross-section	1.5 mm²
Rigid	0.2 – 1.5 mm²
Flexible	0.2 – 1.5 mm²
Flexible with end sleeve	0.25 – 1.5 mm²

Table 61: Terminal X18 – Permissible wire cross-sections

4.4 Display Elements

The LEDs are on the front of the device. The function of the LEDs 1-4 is defined by the application. Each Ethernet port has a green and a yellow LED.

LED	Colour	Function	off	blinking	flashing	on
Power	green	Supply	missing			
LED 1-4		depending on application				
Ethernet LED	green	Link / Activity	not connected	Data traffic		connected
	yellow	Data rate	10 Mbit/s			100 Mbit/s

Table 62: Meaning of the display elements

4.5 Reset key

The functions soft reset and reset to default settings depend on the application.

Designation	Operation	Meaning
Reset	Press at least 3 seconds.	Resets the hardware and restarts it. (Hard reset)
	Press once for a short time.	Resets the software and restarts it. (Soft reset)
	Press three times for a short time within 2 seconds.	Deletes all settings and resets the device to the factory defaults.

Table 63: Function of the reset key

5 Assembly

This section describes how to mount the LSX to a DIN rail, connect the power supply and uninstall it again. Observe the instructions in the "Safety" section of this manual, in particular the "Safety Instructions for Electrical Installation" for that purpose unconditionally.

Caution!

Moisture and liquids from the environment may seep into the interior of the device!

Fire hazard and damage of the product.

The device must not be used in wet or damp environments, or in the direct vicinity of water. Install the device at a dry location, protected from water spray. Disconnect the power supply before you perform any work on a device which may have been in contact with moisture.

Caution!

The device could be destroyed if the wrong power supply is used!

If the device is operated with a power supply that supplies a voltage exceeding the permissible operating voltage, it will be destroyed.

Make sure that you use the suitable power supply. Refer to the Technical Data section for the proper voltage range.

Mounting the device to the DIN rail

How to mount the LSX to a DIN rail:

1. ***Position the device at the DIN rail such that the upper snap-in hooks engage behind the upper edge of the DIN rail.***
2. ***Fold down the LSX perpendicular to the DIN rail until the lower, flexible snap-in hook engages in the DIN rail.***

✓ The LSX is now readily mounted.

Connecting the power supply

⇢ The device has already been mounted to the DIN rail.

⇢ The power supply is connected and switched off.

1. ***Connect the ground lead of the power supply to the plug-in screw terminal "GND".***
2. ***Connect the plus pole of the power supply to the plug-in screw terminal for the power supply.***
3. ***Connect the screw terminal to the power supply socket.***

✓ The LSX is now connected to the power supply.

Disconnecting the power supply

⇢ The device is mounted to the DIN rail.

⇢ The power supply is connected and switched off.

1. ***Disconnect the power supply screw terminal.***

✓ The LSX is disconnected from the power supply.

Removing the device from the DIN rail

How to uninstall the LSX from a DIN rail in a switch cabinet:

⇢ You will need a small flat-blade screwdriver.

⇢ The power supply of the switch cabinet is switched off and secured against being switched on accidentally.

⇢ All connectors at the LSX are disconnected.

1. ***Insert the flat-blade screwdriver into the black lug at the bottom.***
2. ***Move the flat-blade screwdriver up to move the lug down.***

   ✓ The plastic spring with the lower snap-in hook moves down.

3. ***While you hold the plastic spring apart with the lower snap-in hooks, pull the LSX away from the DIN rail.***
4. ***Un-hook the LSX and take it off perpendicularly to the DIN rail.***

   ✓ The LSX is now removed.

6 Maintenance, Repair and Troubleshooting

6.1 Maintenance

The product is maintenance-free and does not require special regular maintenance.

6.2 Troubleshooting

If a failure occurs during the operation of the product, you will find troubleshooting tips in the "Knowledge Base" on our web site (http://www.insys-icom.de/knowledge/). If you need further support, please contact your reseller or INSYS icom. You can contact our support team via e-mail under support@insys-tec.de.

6.3 Repair

Send defect devices with detailed failure description to the source of supply of your device. If you have purchased the device directly from INSYS icom, send the device to: INSYS MICROELECTRONICS GmbH, Hermann-Köhl-Str. 22, 93049 Regensburg.

Before dispatching the device:

- Remove any inserted SIM cards.
- Backup the configuration on the device and any other stored data if required.
- Backup any sandbox applications running on the device.

Caution!

Short circuits and damage due to improper repairs and modifications of products.

Fire hazard and damage of the product.

It is not permitted to open the product for repair or modification exceeding the exchange of plug-in cards.

7 Waste Disposal

7.1 Repurchasing of Legacy Systems

According to the new WEEE guidelines, the repurchasing and recycling of legacy systems for our clients is regulated as follows:

Please send those legacy systems to the following address, carriage prepaid:

Frankenberg-Metalle
Gaertnersleite 8
D-96450 Coburg
Germany

This regulation applies to all devices which were delivered after August 13, 2005.

ⓘ Please consider possible stored passwords or security certificates before disposing the device. It is recommended to block possible existing access rights for the device (e.g. on your VPN server) and reset the device to default settings (if possible), before passing it on or disposing it.

8 Declaration of Conformity

Hereby, INSYS Microelectronics GmbH declares that herein described radio equipment type is in compliance with Directives 1999/5/EC and 2011/65/EC. The full text of the EC Declaration of Conformity is available under the following Internet address:
www.insys-icom.com/manual

For compliance with CE conformity, it is also necessary to comply with DIN EN62311. This controls the exposure of persons to electromagnetic fields.

Adherence to the following boundary condition is necessary for this:

- Persons do not come closer to the antenna than 20 cm for a prolonged time in normal use.
- Only use antennas that we have been approved for the use with this product in our evaluation procedure.

9 FCC Statement

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

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

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

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

10 Export Restriction

The chip sets for analogue modems and cellular radio adapters used by INSYS Microelectronics GmbH are subject to export restrictions as per US ECCN classification (5A991).

Therefore, it is not allowed to export these communication devices into the following countries (at the time when this publication has been issued): Cuba, Iran, North Korea, Sudan, Syria

The currently effective country list can be found in section „Country Group E“ in the document "Supplement No. 1 to Part 740" of the Export Administration Regulations (EAR) (http://www.bis.doc.gov). Please contact the US authorities directly for a special permit.

We want to make you aware that the US legislation may have an effect in Germany. Amongst others, it may happen that US companies may be precluded from supplying foreign violators of the EAR on the basis of US legislation.

Note

Export restriction!

Possible violation of export regulations.

This device uses encryption technology and is therefore subject to export control as per German (AL classification 5A002) and European law (EG-DUAL-USE VO 428/2009). The export from Germany requires a permission of the Bundesamt für Wirtschaft und Ausfuhrkontrolle (Federal Office of Economics and Export Control).

This device may contain components with US origin. Possible export conditions as per US law (ECCN classification) will be mentioned explicitly on receipts, if possible, or can always be requested.

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