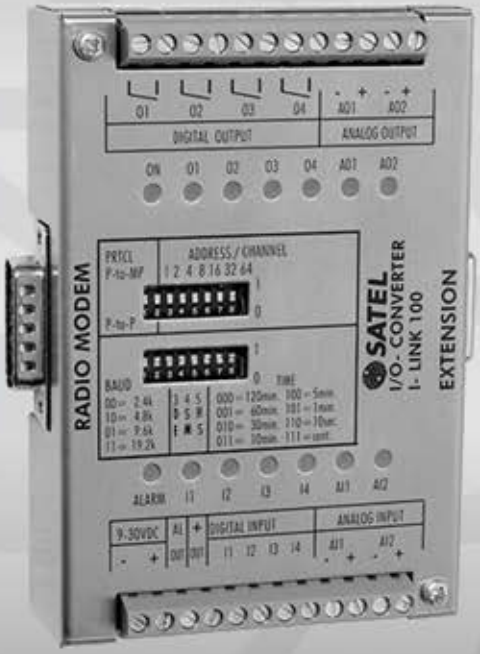
SATEL® I-LINK 100

I/O-CONVERTER
I/O-KONVERTTERI

USER GUIDE
KÄYTTÖOHJE

Version 3.7



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Salo, Finland 2012

PRODUCT CONFORMITY

SATEL I-LINK 100 / 200 / 300

Hereby, SATEL Oy declares that SATEL I-LINK 100 / 200 / 300 I/O-converters are in compliance with the essential requirements and other relevant provisions of Directive 89/336/EEC. Therefore the equipment is labelled with the following CE-marking.

CE 0523 !

DECLARATION of CONFORMITY

In Accordance with

89/336/EEC Directive

of the European Council of 3rd May 1989 on the approximation of the laws of the Member States relating of electromagnetic compatibility

Doc No: SATEL-DC-EMC-089

Manufacturer: **SATEL Oy**

Address: P.O.Box 142, (Meriniitynkatu 17)
24101 Salo
FINLAND

Product: **SATEL I-LINK 100 / 200 / 300** I/O Converters
SATEL C-LINK Pulse Counter
SATEL i-LINK I/O Converter and Pulse Counter

Application: External products for SATELLINE Radio Modems

We, the manufacturer of the above mentioned products, hereby declare that these products conform to the requirements of the European Council directive 89/336/EEC. This Declaration of Conformity is based on that the manufacturer has tested the Products according to the following standards: ENV 50140 (RF Immunity), EN 55022 / CISPR 22 (RF Emission), EN 61000-4-2 (ESD) and EN 61000-4-4 (EFT/Burst).

Salo on the 9th of August, 2010.

SATEL OY
Pekka Aura
CEO

LOCAL AREA WIRELESS DATA COMMUNICATIONS • SATEL OY •

SATEL Oy
P.O.Box 142, FI-24101 SALO, FINLAND
Street: Meriniitynkatu 17, FI-24100 SALO, FINLAND
Tel. +358 2 777 7800, Fax +358 2 777 7810
E-mail: info@satel.com, www.satel.com

SATEL®
WIRELESS WORLD – LOCAL SOLUTION

WARRANTY AND SAFETY INSTRUCTIONS

Read these safety instructions carefully before using the product:

Warranty will be void, if the product is used in any way, which is in contradiction with the instructions given in this manual, or if the housing of the radio modem has been opened or tampered with.

The radio modem is to be used only on frequencies allocated by local authorities and without exceeding the given maximum allowed output power ratings. SATEL is not responsible, if any products manufactured by it are used in unlawful ways.

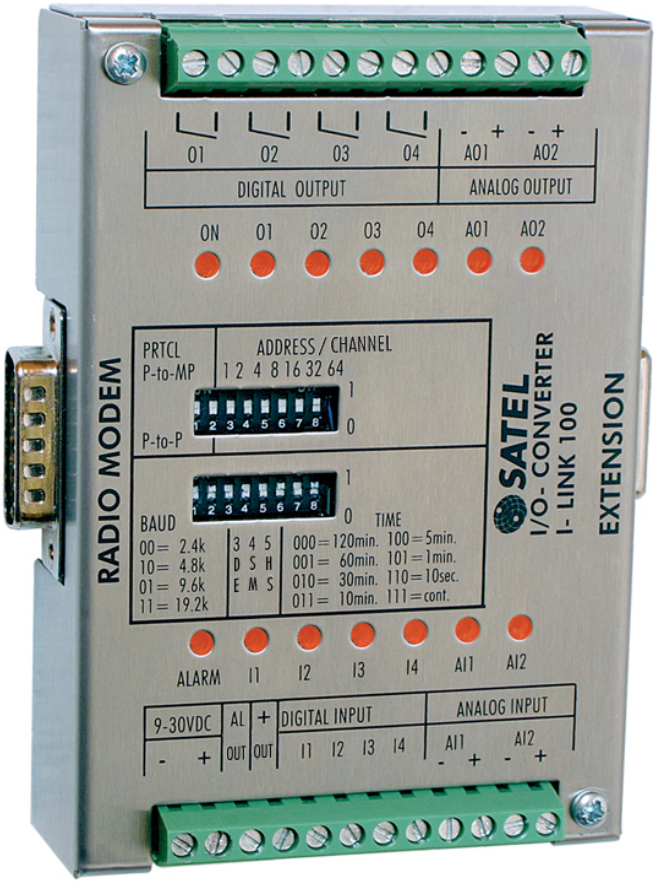
The devices mentioned in this manual are to be used only according to the instructions described in this manual. Faultless and safe operation of the devices can be guaranteed only if the transport, storage, operation and handling of the devices are appropriate. This also applies to the maintenance of the products.

To prevent damage both the radio modem and any terminal devices must always be switched OFF before connecting or disconnecting the serial connection cable. It should be ascertained that different devices used have the same ground potential. Before connecting any power cables the output voltage of the power supply should be checked.

1 GENERAL

1.1 SATEL I-LINK 100 I/O- converter

The SATEL I-LINK 100 is a Point-to-Point or Point-to-Multipoint transparent I/O-converter. The device works together with SATELLINE modems. A digital or analogue I-LINK 100 input-point can be set through the modem to be output in the other end. Point-to-Multipoint transmission is possible adopting software suitable for the SATEL I-LINK 100.



Output Connectors

O1...O4	Digital outputs
- +	+/- for analogue outputs
AO1, AO2	Analogue outputs

Output indicators

ON	Power ON/OFF indicator
O1-O4, AO1, AO2	Output indicators

Setting switches

PROTOCOL	P-to-MP, Point-to-Multipoint P-to-P, Point-to-Point
ADDRESS / CHANNEL	Multipoint address / Channel select *)
BAUD	Baud rate settings
3 DE	Alarm delay
4 SM	Safe mode
5 HS	Handshaking
TIME	Transmission interval of analogue inputs

Input indicators

ALARM	Indicator for failed transmission
I1...I4, AI1, AI2	Input indicators

Input Connectors

9-30VDC/ - +	Supply Voltage
AL OUT ⎍	Alarm output
+	Common + for digital inputs and extension units
I1...I4	Digital inputs
AI1, AI2	Analogue inputs
- +	- /+ for analogue inputs
RADIO MODEM	Connector for radio modem
EXTENSION	Connector for extension units

*) Valid only together with SATELLINE-1870 and 1870E radio modems.

2 SPECIFICATIONS

FEATURE	min-max	typical	note
Voltage	+9…+30 Vdc	24 Vdc, typical	
Power consumption	0.3 ... 1.0 W	-	
Serial Interface	RS-232 ± 15 Vdc	± 6 Vdc	active RS232
Extension Interface	-0.3…+6 Vdc	0.5…5 Vdc	active TTL
Response time	< 250 ms	< 300 ms	@ 9600 bps
Operational temperature	-25…+55 °C		
Transfer rates	2400 – 19200 bps		
Stability	± 1 %		@ for whole temp. range
ANALOGUE SIGNALS			
Inputs, 2 pcs	0 – 25 mA	4 – 20 mA	resistive 165 Ω
Outputs, 2 pcs	0 – 25 mA	4 – 20 mA	active
Sample interval	cont- 120min	-	selectable
Resolution		12 bits	
Accuracy		<0.4 %	
DIGITAL SIGNALS			
Inputs, 4 pcs	0 – 35 Vdc	0 – 30 Vdc	resistive 4-5 kΩ
Outputs, 4 pcs	0 – 250 Vac / 2 A	0 – 250 Vac / 2A	relay contacts
INDICATORS			
Indicators	Power ON/OFF, digital/analogue IN/OUT, Alarm		
OTHER OUTPUTS			
Alarm Output	0 – 35 Vdc / 30 mA	24 Vdc / 20 mA	active + 30 mA
GENERAL			
Casing	Stainless steel		
Fail-state	In the fail-state all I/O-points remain unchanged		
Connectors	D-15 for SATELLINE radio modem, D-15 for the extension module		
Size L x W x H	123 x 85 x 30 mm		
Weight	120 g		
Mounting	Wall plate or DIN-rail		
IP	IP-20		
Modem compatibility	SATELLINE-2ASxE, 3AS-serie, 1870, 1870E and 1915		

Connection between I-LINK 100 and SATELLINE radio modem

Direction	Signal	I-LINK100, D-15
←	+VB, DTR	1, 14, 15
←	GND, SGND	7, 8
→	RD	9
←	TD	11
←	RTS	13
→	CTS	6

3 FUNCTIONS

3.1 Operational Voltage, 9 – 30 Vdc

- The supply voltage is connected to the connector 9-30 VDC (-) and (+).
- + OUT connected to VDC through an internal fuse. The supply voltage for the extension units must be taken from this output. Can also be used for analogue input sensors.

3.2 Alarm output, AL OUT

- The AL OUT is activated if three (3) transmission fails occur in turn. When activated the output state goes to +VDC. When the transmitting I-LINK 100 sends information to another I-LINK 100 it requires a confirmation. In case there is a fail in transmission and the I-LINK does not receive the confirmation, the transmission will be resend maximum three (3) times or until a confirmation is received.

3.3 +OUT

- A voltage output for the extension units. Connected to +VDC through an internal fuse.

3.4 Digital Inputs (I1…I4) and Outputs (O1…O4)

- Inputs,
  - 4 pcs. Activated with + voltage.
  - An input must maintain the active state >50 ms for proper detection.
- Outputs,
  - 4 pcs. Open relay contacts. Can be connected to any 0 - 250 Vac / 2A load.
  - All outputs are set active for a period of ~240 ms, starting ~6 ms after switching the supply voltage to the unit.

3.5 Analogue inputs (AI1 –, AI1+, AI2-, AI2+) and outputs (AO1-, AO1+, AO2-, AO2+)

- Inputs,
  - 2 pcs. Normal range is 4 - 20 mA. Whole range is 0 – 25 mA showing that the limits have been exceeded. The input load is resistive 165 Ω.
- Outputs,
  - 2 pcs. Normal range is 4 – 20 mA. Whole range is 2-25mA.
- Sample Interval
  - Sample interval sets the time how often analogue information is sent. The sample interval can be selected using the 3 TIME-switches according to the time table i.e. "000" sends an analogue level sample in each 120 minutes intervals, "011" each 10 minutes etc. "111" will cause a continuous transmission. Due to modem's functionality this is about in each (1) second.

3.6 Indicators

- ON
  - Power ON/ OFF. Illuminated when +VCD connected.
- O1…O4, AO1, AO2

- Showing the status of the output. Illuminated when there is information on the output. Flashing when range has been exceeded. OFF, when low state or nothing on the input.

- **ALARM**
  - Illuminated, if a fail in transmission has occurred. When the transmitting I-LINK 100 sends information to another I-LINK 100 it requires a confirmation. In case there is a fail in transmission and the I-LINK does not receive the confirmation, the transmission will be resent maximum three (3) times or until a confirmation is received.
- **I1...I4, AI1, AI2**
  - Showing the status of the input, illuminated steadily when the input is in the normal 4 – 20 mA range. Flashing when range has been exceeded. OFF, when low state or nothing on the input.

3.7 Swithces

- **PRTCL** , Protocol-switch
  - P-to-MP @ Point-to-Multipoint (Master-Slave) -operation.
  - P-to-P @ Point-to-Point –operation

- **ADDRESS** / CHANNEL
  - Used at Point-to-Multipoint- operation to select the individual I-LINK 100
  - Maximum number of addresses is127.

- ADDRESS / **CHANNEL**
  - The channel selector is used together with M2M-package and SATELLINE-1870 or 1870E radio modems. More information about this in the user guide of M2M-package. NOTE! Check that the address switches are not used (ON) in Point-to-Point mode with other than SATELLINE-1870 or 1870E radio modems.

- **BAUD**
  - The baud rate can be selected as follows: 00=2.4 kb/s, 10=4.8 kb/s, 01=9.6 kb/s, 11=19.2 kb/s

- **3 DE** Delayed alarm setting

- **4 SM** Safe Mode setting
  - Immediate / Delayed Alarm

  In case of a failure in the transmission, the alarm response can be selected from immediate alarm to 10 minutes delayed
  - Unchanged state / Safe Mode state

  In case a failure in transmission, the outputs can be set to remain their status or change to "Safe Mode" which will switch all outputs to OFF-position. Safe Mode timing follows the setting of switch 3 DE, so it can be immediate or delayed.

  The functions set by the dip –switches 3 and 4 are as follows:

3 DE	4 SM
0	0 = Immediate Alarm / No Safe Mode
0	1 = Immediate Alarm / Immediate Safe Mode
1	0 = Alarm delayed by 10 minutes / No Safe Mode
1	1 = Alarm delayed by 10 minutes / Safe Mode delayed by 10 minutes

- **5 HS** For setting CTS-control (clear to send) On or OFF
  1 = CTS OFF, 0 = CTS ON.

- **TIME**
  - Defines how often the analogue input message is transmitted. The intervals are as follows:

000=120 min	100=5 min
001=60 min	101=1 min
010=30 min	110=10 sec
011=10 min	111=continuous

4 OPERATION

Operation mode is selected by using the **PRTCL**-switch. The operations are Point-to-Point or Point-to-Multipoint. In Point-to-Point operation the system has one pair of units, whereas the inputs at one end will became outputs on the other end.
In Multipoint mode one master can command one or more (max 127) slaves.

4.1 Point-to-Point

Point-to-point operation is between two units. The inputs of one I-LINK 100 will be transferred to the outputs of other I-LINK 100.

4.1.1 Updating digital messages

Digital information (relay, switch etc.) will be sent to the other unit always, when there is a state change at the input.

4.1.2 Updating analogue messages

Analogue information will be sent to the other unit according to the TIME-setting or as well as digital information state changes.

4.1.3 Beginning with Point-to-Point operation

- Connect SATELLINE radio modem to I-LINK 100 directly to the RADIO MODEM -connector or using the interface cable.
- The "PRTCL"- switch must be "0 " in the P-to-P-position.
- Before connecting the device to a power supply, connect first all inputs and outputs that are to be used.
- Select the SATEL I-LINK 100 BAUD-rate. 00=2.4, 10=4.8, 01=9.6, 11=19.2
- Check that the radio modem baud rate is same as for the I-LINK and the other parameters are "9600-N-8-1" (9600 bps is a default setting, but can be changed to be any of the BAUD-rates given above).
- Set the analogue message transmission time interval using TIME -switches as described above, if that feature is needed.
- When both units have these basic settings (TIME can be different) the supply voltage can be connected.
- NOTE! Check that the address switches are not used (ON) in Point-to-Point mode with other than SATELLINE-1870 or 1870E radio modems.

4.2 Point-to-Multipoint

In this mode one Master can drive one or more slaves (max 127 pcs).

4.2.1 Updates

The updates are controlled by the Master, which sends messages to the slaves or asks status information from them. As the master is the controlling unit the TIME settings of the I-LINK 100 is not valid.

There are two options on how to use the Point-to-Multipoint with the I-LINK 100.

1. You can have your own system and program and integrate I-LINK 100 into it; the commands are described below.
2. You can have an easy–to-use SATEL I-LINK PC-software.

4.3 Starting the Multipoint operation

- Connect one SATELLINE radio modem to the PC COM-Port. This one is the Master unit.
- Connect the I-LINK 100 Slave-units to the SATELLINE radio modems directly to I-LINK 100 Radio Modem connector or using a interface cable
- The "PRTCL"- switch must be "1 ", in the P-to-MP-position.
- Before connecting the device to a power supply, connect first all inputs and outputs that are to be used.
- Select the SATEL I-LINK 100 BAUD-rate. 00=2.4, 10=4.8, 01=9.6, 11=19.2
- Check that the radio modem baud rate is same as for I-LINK and that other parameters are "9600-N-8-1" (9600 bps is a default setting, but can be changed to be any of the BAUD-rates given above).
- Set the individual addresses to all slaves. (As this is a Master–Slave operation, the Slaves have to be addressed). All slaves must have different address.

4.4 Multipoint messages

4.4.1 General information

The functions of an I-LINK 100 converter and its extension units can be controlled or status information requested by the Multipoint messages. The data communication between SATELLINK PC (Pro) software and I-LINK 100 is based on these messages. The messages can be implemented to customer specific application software as well.

All multipoint messages are ASCII character strings. Their general structure is as seen below.

General message structure

<STX>	DATA	CRC	<ETX>

Each message begins with a character <STX> ('start of text', 02 hex) and ends with a character <ETX> ('end of text', 03 hex).

The messages (except ACK and NACK) include also a **CRC** checksum field for error check purposes. The CRC checksum must be inserted to messages by the user equipment. CRC-value is calculated from the DATA field only.
The DATA field contains addresses, extension definition, length and the actual message.

List of different message types

Message Type	Function	Description	Sub clause
SET	Set command or Status reply	Sets the digital or analogue outputs of an I-LINK 100 or its extension unit. Or is a reply to a request (GET) of output status.	4.4.2
GET	Status request	Requests for digital or analogue input status of an I-LINK 100 or its extension unit.	4.4.3
ACK	Acknowledgement	I-LINK 100 replies with an ACK-message if it has received a command properly.	4.4.4
NACK	Message not	If a command has not been properly received,	4.4.5

	acknowledged	I-LINK 100 replies with NACK	
CFS	Set command or Status reply with diagnostic timer and safe mode settings	Sets the outputs and also a diagnostic timer and safe mode parameter of an I-LINK 100 unit. It is also a status reply to CFG command.	4.4.6
CFG	Status request	Status request like the GET message, but to the CFG request I-LINK 100 replies with CFS message.	4.4.7
VER	Version request or Version reply	Retrieves or replies with the firmware version info of I-LINK 100.	4.4.8

4.4.2 SET-message

With SET-message the MASTER sets the states for the slave. After a sent message master waits for the acknowledgement. If everything was ok, the slave answers by sending an ACK-message. If the message was got but not understood (i.e. fail in CRC), the slave sends a NACK-message. The slave sends SET messages only by request. The master can send SET-messages any time.

The structure of a SET-message

Field value (ASCII)	<STX>	4C	12	FFF	0A	SET3000000	49A6	<ETX>
Field size (bytes)	1	2	2	3	2	10	4	1
Bit value (hex)	02	3443	3132	464646	3041	see below	34394136	03
Description	Start char.	Receiver address	Sender address	Extension definition	Length	MESSAGE	CRC-checksum	End char.

The MESSAGE includes all commands to the unit. In the example it is SET3000000. The structure is as follows:

Field value (ASCII)	SET	3	000	000
Field size (bytes)	3	1	3	3
Bit value (hex)	534554	33	303030	303030
Description	Command	Setting of digital output ports	Setting of analogue port1	Setting of analogue port2

Extension module definitions

Character in Extension definition field	Function
F	No extension unit in position
1	I-LINK 200 installed
2	I-LINK 300 installed

Example: 3 extension modules installed, I-LINK 200 + I-LINK 300 + I-LINK 200 → Extension field value = 121.

Message examples when the extension modules are used.

Example A: **1 Extension module, I-LINK 200** (4 digital + 2 analogue I/O)

<STX>	01	02	1FF	11	SET20000002000000	3904	<ETX>
Start char.	Receiver address	Sender address	Extension definition	Length	MESSAGE	CRC-checksum	End char.

Example B: **2 Extension modules, I-LINK 200** (4 digit.+ 2 anal.)**+ I-LINK 300** (6 digital)

<STX>	01	02	12F	13	SET220010080008O0F3	FB0B	<ETX>
Start char.	Receiver address	Sender address	Extension definition	Length	MESSAGE	CRC-checksum	End char.

Example C: **3 Extension modules, I-LINK 200 + I-LINK 300 + I-LINK 200**

<STX>	01	02	121	13	SET20000002000000F32000000	5318	<ETX>
Start char.	Receiver address	Sender address	Extension definition	Length	MESSAGE	CRC-checksum	End char.

Table for setting the digital outputs ON. **All Ports OFF= 0**

	Outputs 1-2-3-4																Outputs 5-6		
Ports set	-	1	2	2,1	3	3,1	3,2	3,2,1	4	4,1	4,2	4,2,1	4,3	4,3,1	4,3,2	4,3,2,1	5	6	5,6
Set Value (ASCII)	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**	**1**	**2**	**3**

Table for setting the analogue values (increases 0.006059082 mA / step)

Set value (ASCII)	000	001	002	003	004	.....	FFF
Value (mA)	000	0,006	0,012	0,018	0,024	.....	24,818

4.4.3 GET-message

With GET-message the Master can ask the status from the slave. GET-message is always answered by ACK-message followed by SET-message. If the slave receives the message, but it was not understood (i.e. fail in CRC), the slave answers with a NACK-message.

The structure of a GET-message is as follows:

<STX>	4C	12	03	GET	F475	<ETX>
Start character	Receiver address	Sender address	Length	Message	CRC-checksum	End character

4.4.4 ACK-message

The equipment that has received a GET or SET request, will answer with an ACK-message.

The structure of an ACK-message is as follows:

<STX>	4C	12	6	<ETX>
Start character	Receiver address	Sender address	ACK-character	End character

4.4.5 NACK-message

The slave sends NACK-message, if it has got a GET or SET request, but has not been able to decode the request (for example error in CRC-check).

The structure of a NACK-message is as follows:

<STX>	4C	12	F	<ETX>
Start character	Receiver address	Sender address	NACK-character	End character

4.4.6 CFS-message (set)

CFS-message is a diagnostic message that sets the time interval for the next CFG or GET message. The I-LINK starts counting according to the diagnostic time setting and if the next message comes within the set time nothing happens. If the message does not come within the set time, the I-LINK makes the predefined procedures. Any command from the master station resets the timer.

The structure of a CFS message:

<STX>	4C	12	FFF	03	CFS	*1	*1	*1	*2	<ETX>
Start char.	Receiver address	Sender address	Extension definition	Length	Command name	Safe mode	Time setting	Port settings	CRC-checksum	End char.

*1 = for field value and length, please refer to the tables below.

*2 = value depends on the data field contents.

Field name	Field size (no of char.)	Description / Value options
Safe mode	1	Describes what must be done, if the time count is exceeded. "0" = no action. "1" = Sets the Alarm high. "2" = Sets all Output low and Alarm high. "3" = Sets all Output high and Alarm high. "4" = Sets the Outputs to pre-defined stages and Alarm high.
Time setting	4	Defines the polling time interval from the master station. If value is 0 it will not be counted. The resolution time value is described in minutes.
Port settings	7…28	See chapter 4.4.2 for port setting options of I-LINK 100, 200 and 300

NOTE! CFS command saves always port states, regardless of the Time and Safe Mode settings.

4.4.7 CFG-message (get)

CFG command works in a similar way as GET command.

The structure of a CFS message:

<STX>	4C	12	03	CFG	*2	<ETX>
Start char.	Receiver address	Sender address	Length	Command name	CRC-checksum	End char.

*2 = value depends on the data field contents.

The CFG-question is acknowledged with ACK, followed by CFS, which describes the current settings.

NOTE! When the slave gets any message from the master after the alarm, it will automatically set all the output ports to the previous state.

4.4.8 VER-message

This message retrieves the SW-version of the I-LINK 100
VER. SW-question.

The structure of a VER request message:

<STX>	01	00	03	VER	657A	<ETX>
Start char.	Receiver address	Sender address	Length	Message	CRC-checksum	End char.

The structure of a VER response message:

<STX>	4C	12	FFF	03	VRS	v1.0A*1	A0DB	<ETX>
Start char.	Receiver address	Sender address	Extension definition	Length	Message	SW Version	CRC-checksum	End char.

*1 = please note that the "v" is a lower case letter, not a capital one.

4.5 CRC-checksum function

The checksum to be used is a **16 bit CRC (Cyclic Redundancy Check) checksum**.
(CRC-value is calculated from the DATA-message only (incl. addresses, extension definition, length and message).

The CRC used in the message protocol of I-LINK 100 is calculated in a similar way to the widely used CRC-CCITT but using slightly different values of parameters.

The parameters used in the calculation of CRC checksums are:

- *Polynomial* - Defines the polynomial for the calculation. I-LINK 100 uses the polynomial X^16 + X^12 + X^5 + 1 (i.e. 0x1021 for the algorithm of SATEL I-LINK 100)
- *Initial Value* = the value to be initially loaded in the crc register before the calculation.
- *Reverse Databits* = Reverse the bit order (lsb<->msb) of the data bytes before the calculation.
- *Reverse result before XOR* = is the bit order of the result of the calculation to be reversed or not before the final XOR operation.
- *XOR* = the final step - the value to be XORed with the result of the calculation.

The CRC used in the message format of SATEL I-LINK 100 is calculated using the parameters below:

- Polynomial = 0x1021 (CCITT)
- Initial Value = 0xFFFF
- XOR = FFFF
- Reverse Databits = Yes
- Reverse result before XOR = Yes

To compare, CRC-CCITT is calculated using the following parameters:

- Polynomial = 0x1021 (CCITT)
- Initial Value = 0xFFFF
- XOR = 0
- Reverse Databits = No
- Reverse result before XOR = No

Note: The contents of the Checksum field of the actual message can be derived by converting the 16 bit binary CRC checksum to four hex-ascii characters.
An example: if the checksum is 0001111100000010 (binary), the four ASCII characters of SSSS will be '1', 'F', '0' and '2' consequently.

The source code listing written in C language below can be applied to calculate the binary value of CRC:

```
unsigned short CRC_16 (unsigned char length, unsigned char *data)
{
      unsigned short crc_table[16] =
      {
            0x0000, 0x1081, 0x2102, 0x3183, 0x4204, 0x5285, 0x6306,
      0x7387,
                  0x8408, 0x9489, 0xA50A, 0xB58B, 0xC60C, 0xD68D,
0xE70E, 0xF78F
      };

      unsigned short crc = 0xFFFF;
      unsigned char tmp, index, i;

      for (i = 0; i < length; i++)
      {
            tmp = data[i];
            index = ((crc ^ tmp) & 0x000F);
            crc = ((crc >> 4) & 0x0FFF) ^ crc_table[index];
            tmp >>= 4;
            index = ((crc ^ tmp) & 0x000F);
            crc = ((crc >> 4) & 0x0FFF) ^ crc_table[index];
      }

      return (~crc);
}
```

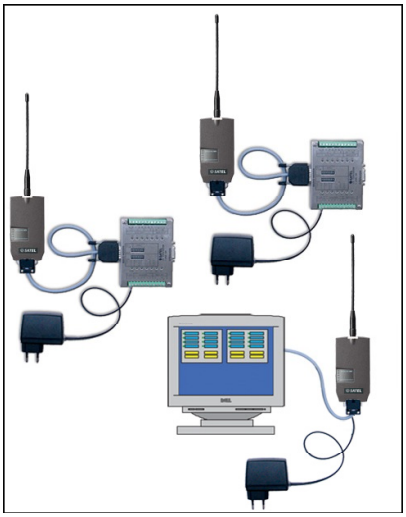
5 FACTORY SETTINGS

The I-LINK 100 I/O-converter is shipped with the following default settings (unless specifically ordered with settings other than those listed below):

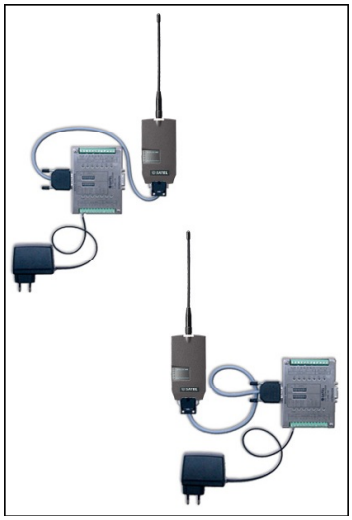
FIXED SETTINGS DEFINED AT THE TIME OF ORDER		
PRTCL, protocol-switch	P-to-P	= Point-to-Point
ADDRESS	0000000	
BAUD	01	= 9600 bps
3 DE, Alarm delay	0	= no delay
4 SF, Safe mode	0	= Safe Mode OFF
5 HS Handshaking	0	= CTS ON
TIME, Analogue transmission interval	000	= 120 minutes

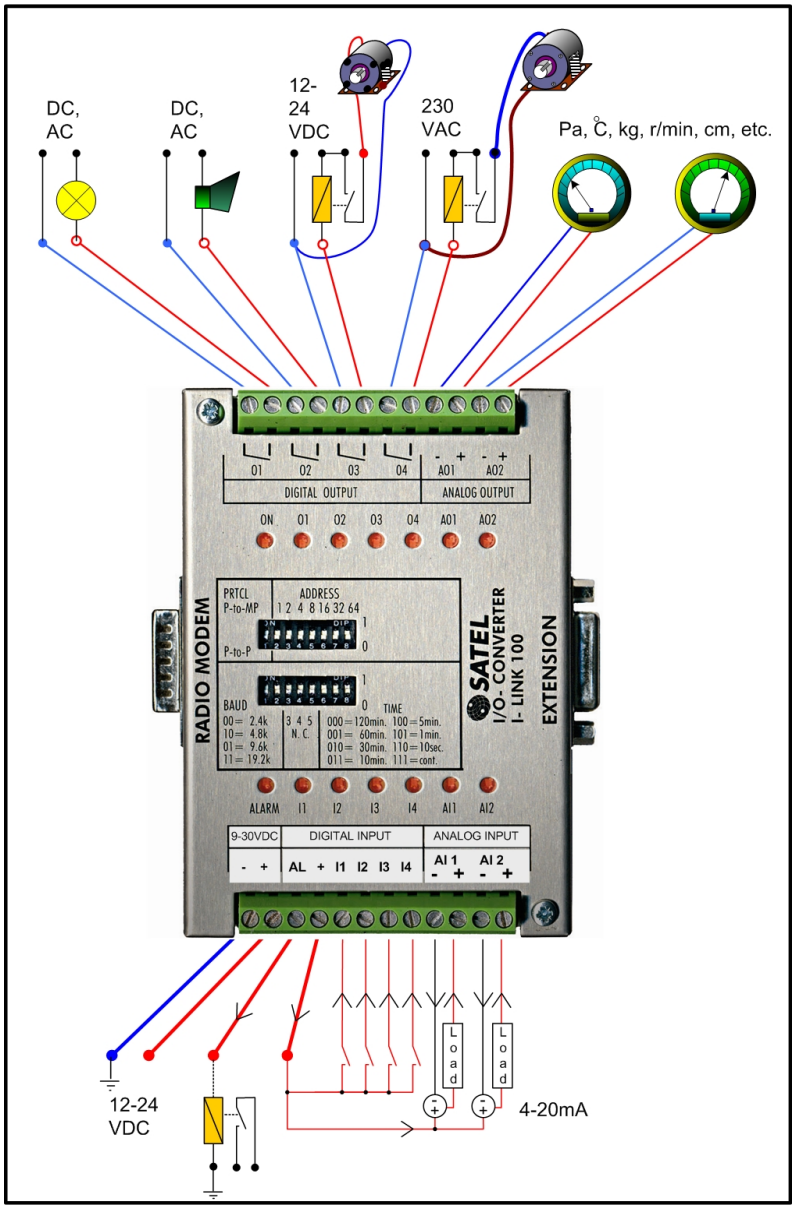
6 CONNECTION EXAMPLES

Point-to-Multipoint with one master and two slaves



Transparent Point-to-Point application





7 ACCESSORIES

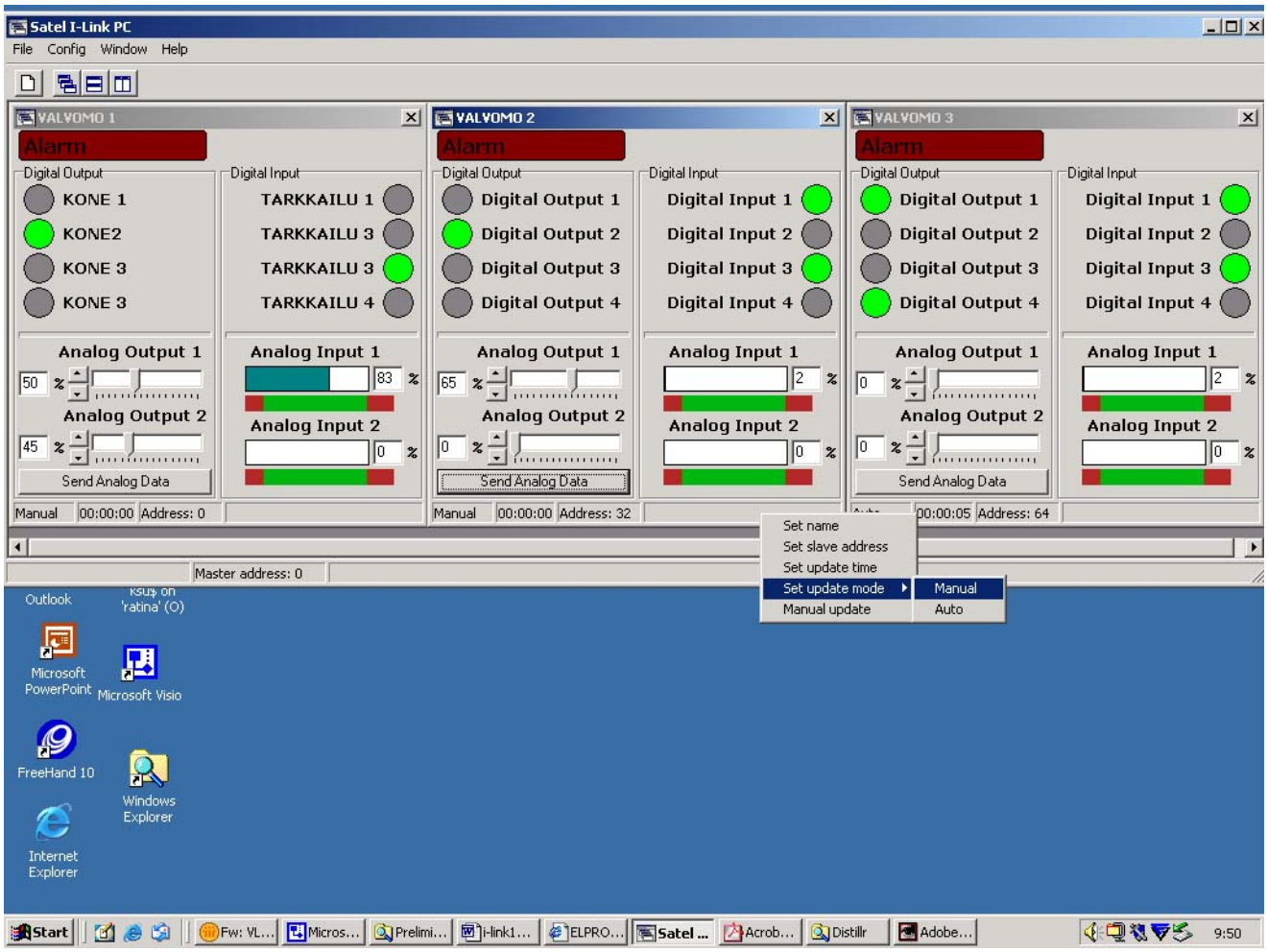
INTERFACE CABLES FOR CONNECTING OF I-LINK 100 AND SATELLINE RADIO MODEMS

Point-to-Point	**CRS-TSU**	I-LINK 100	SATELLINE-2ASxE, 3AS-serie
Point-to-Point	**CRS-18IF**	I-LINK 100	SATELLINE-1870, 1870E
Point-to-Multipoint	**CRS-2F**	PC	SATELLINE-2ASxE, 3AS-serie
Point-to-Multipoint	**CRS-18F**	PC	SATELLINE-1870, 1870E

SATEL I-LINK PC and SATELLINK PC Pro

Complete program that makes it possible to operate a Multipoint system with a PC. SATEL I-LINK PC is a basic version of the program. SATELLINK PC Pro is more detailed professional version.

Layout of the **SATEL I-LINK PC** Multipoint-program



8 EXTENSION MODULES

General

1… 3 extension modules can be connected to SATEL I-LINK 100. The system functions both on Point-to-Point and Multipoint protocols. At Point-to-Point protocol the respective extension modules operate as pairs according to their address setting. The extension modules must always be connected to I-LINK 100 control unit, they do not operate alone.

I-LINK 200, 4 digital and 2 analogue inputs and outputs

I-LINK 300, 6 digital inputs and outputs

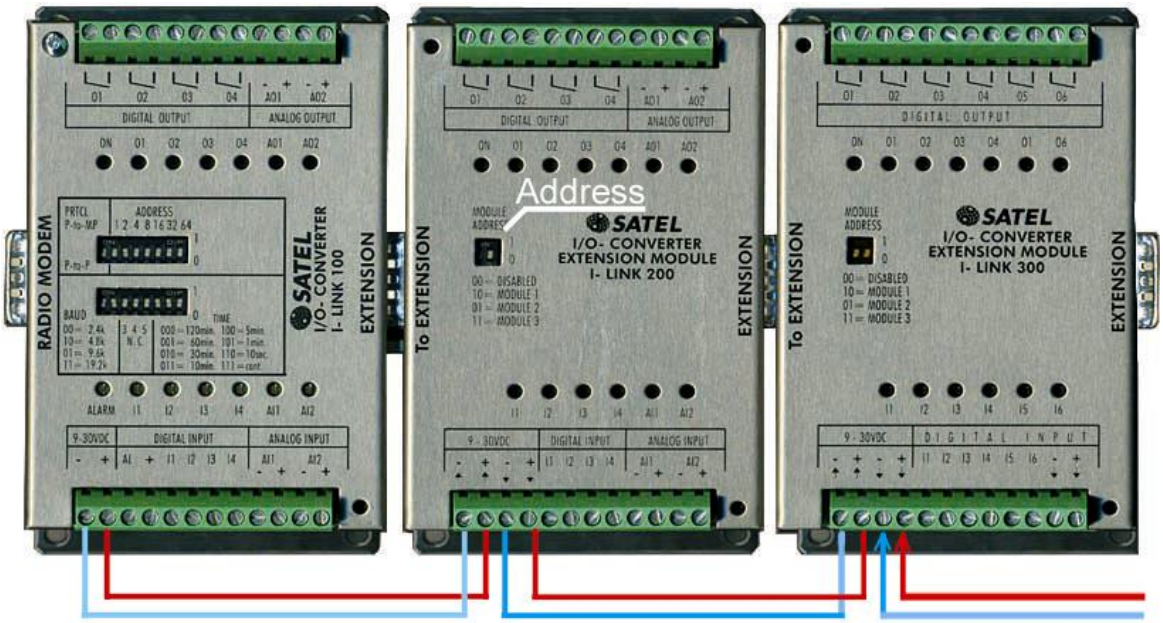
Assembly

The modules are joined together by connecting the EXTENSION and To EXTENSION connectors as in the picture. The extension modules can be joined in any order. The number of extension modules is 1…3 pcs (I-LINK 100 + 1…3 extension modules).

I-LINK 100 Main module
4 digital
2 analogue I/O-ports

I-LINK 200 Extension
4 digital
2 analogue I/O-ports

I-LINK 300 Extension
6 digital I/O-ports



Connections

The I/O-ports of the extension modules are connected same way as the main unit's I/O-ports. The supply voltage is not linked through the modules, so it must be connected using the green screw contacts. The supply voltage must be connected directly to the I-LINK 100. The I-LINK 100 is equipped with and internal fuse (self recovery type), therefore the extension must get the supply voltage from the pin +OUT. If there are many Extension modules the linking can be done what is the most practical for the wire work (see the picture).

Settings

Extension modules that are working as pairs in Point-to-Point operation must be same type and have same address. The address is set by the "Module Address"- switches. The alternatives are: 00=Module not in operation, 01, 10 and 11. Location is shown in the picture as "Address".