# Hardware Guide

**LAN I/O - LAN Controller / XL / XXL
Multistream**

## EG Declaration of Conformity

*The following products*

**IRTrans LAN I/O**

**IRTrans LAN Controller / XL / XXL**
**IRTrans LAN Controller Multistream 16**

*are confirmed to comply with*

**DIN EN 55024: 1998 + A1: 2001 + A2: 2003.**

# Contents

## 1. IRTrans LAN I/O

The IRTrans LAN I/O module is an infrared (IR) transceiver with Ethernet interface and various other connectivity options.

The basic functions are:

- IR send and receive
- 2 outputs for external transmitters
- 1 input for external receivers
- 10/100 MBit Ethernet connection
- Webinterface for configuring system settings
- RS232 connection
- 2 Analog inputs
- 2 Relay outputs
- 128k Flash memory (approx. 1000-1500 IR commands)

The IRTrans LAN I/O can be fitted with an PoE (Power over Ethernet) option. Then the device can be powered using the Ethernet cable according to IEEE 802.3af.

### 1.1 Connections



IRTrans LAN I/O front

On the front there are (left to right):

- 2 3.5mm connectors for analog inputs
- Status LED
- IR LEDs
- 3 IR receivers (38kHz, 455kHz and COD-RCV)
- 3.5mm connector for external receiver
- RS232

**IRTrans LAN I/O back**

On the back there are (left to right):

- Power connector
- Ethernet connector
- 2 outputs for external transmitters
- 2 connectors for relays

If the device is fitted with 4 IR outputs (4X option) the two connectors will be stereo jacks.

### 1.2 Power supply

The IRTrans LAN I/O is powered by an external power supply. It must deliver 8-16V and 300mA per IRTrans device. The positive lead is wired to the center terminal of the 5,5/2,1mm hollow connector.

A 5,5/2,5mm connector may fit as well but will not have reliable contact. The IRTrans will encounter seemingly inexpliccable reboots.

When using external high power transmitters the power supply should be capable of delivering 500mA.

Devices with PoE capability can be powered using the network cable. In this case it is not necessary to connect a power supply to the hollow connector.

## 2. IRTrans LAN Controller

The IRTrans LAN Controller is the smallest in the range of LAN Controllers. This device is equipped with:

- IR send and receive
- 4 outputs for external transmitters
- 4 relay outputs
- 10/100 MBit Ethernet connection
- RS232
- 128k Flash memory (approx. 1000-1500 IR commands)

### 2.1 Connections



**IRTrans LAN Controller back**

On the back there are (left to right):

- Ethernet connector
- 4 Relay outputs (4 to 1, #4 is in the leftmost position)
- 4 outputs for external transmitters (4 to 1, #1 is in the rightmost position)
- Power supply connector
- RS232 / IRTrans Bus connector (RJ12)

### 2.2 Power supply

The IRTrans LAN Controller is powered by an external power supply. It must deliver 8-16V and 300mA per IRTrans device. The positive lead is wired to the center terminal of the 5,5/2,1mm hollow connector.

A 5,5/2,5mm connector may fit as well but will not have reliable contact. The IRTrans will encounter seemingly inexpliccable reboots.

## 3. IRTrans LAN Controller XL

The IRTrans LAN Controller XL is an augmented version of the LAN Controller. Additionally ther are:

- 8 IR outputs (instead of 4)

- 2 inputs for external receivers

- RS232 interface on the front (D-Sub9 usable without an active cable)

- All connectors are labeled

## 4. IRTrans LAN Controller XXL

The IRTrans LAN Controller XXL is the top-of-the-line model in the range of LAN Controllers. It comes in a 19" rackmount case and is equipped with:

- 16 outputs for external transmitters
- 4 relay outputs
- 3 receivers (38kHz, 455kHz, universal learning receiver)
- 2 inputs for external receivers
- 10/100 MBit Ethernet interface
- RS232
- 128k Flash memors (approx. 1000-1500 IR commands)
- RJ12 connector for IRTrans Bus or second RS232 connection (with special cable)



**IRTrans LAN Controller XXL**

### 4.1 Notes for using IR outputs 9-16

Due to the design of the LAN Controller XXL it is not possible to send to all external transmitters at the same time. Selecting „All LEDs" in the IRTrans GUI Client will only activate LEDs 1-8.

Über eine entsprechende Einstellung im IRTrans GUI Client (Device Mode -> „Alle ext. Ausgänge emulieren") lässt sich aber eine Emulation der weiteren Ausgänge aktivieren. Hier wird der entsprechende IR Befehl mehrmals durch die Firmware an die verschiedenen Ausgänge gesendet (Insgesamt 7 Sendevorgänge). Dadurch dauert das Senden eines Befehls üblicher Länge an alle Ausgänge ca. 1s.

### 4.2 Power supply

The IRTrans LAN Controller is powered by an external power supply. It must deliver 8-16V and 300mA per IRTrans device. The positive lead is wired to the center terminal of the 5,5/2,1mm hollow connector.

A 5,5/2,5mm connector may fit as well but will not have reliable contact. The IRTrans will encounter seemingly inexpliccable reboots.

## 5. IRTrans LAN Controller Multistream 16

The IRTrans LAN Controller Multistream 16 combines 16 independent IRTrans devices in one 19" rackmount case with a common Ethernet interface. All 16 outputs can be adressed individually and can send different IR codes all at the same time. Additionally a RS232 port allows controlling external Hardware.

There is no receiver in the IRTrans LAN Controller Multistream. Receiving IR commands is therefore not possilbe. For sending every IR database generated with any IRTrans device can be used..



By default the Ethernet interface operates at 100MBit half duplex. It can be reconfigured to 10Mbit as well as full duplex mode:
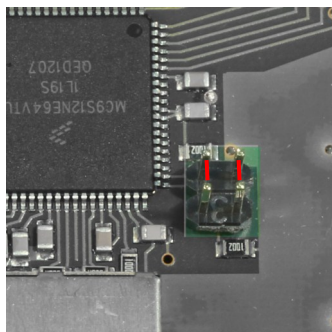


**Left Jumper: 10MBit (set) / 100MBit (open)**

**Right Jumper: full duplex (set) / half duplex (open)**

## 6. Ethernet interface

The Ethernet interface allows to integrate the IRTrans in any IP based Ethernet. The IP stack runs on a Freescale MC9S12NE64 processor.

By default the ethernet interface is set to 100MBit but can be reconfigured to 10MBit if desired.

Communication between the IRTrans and the server usually happens on TCP/UDP port 21000. This port is registered for IRTrans and may have to be opened in firewalls.
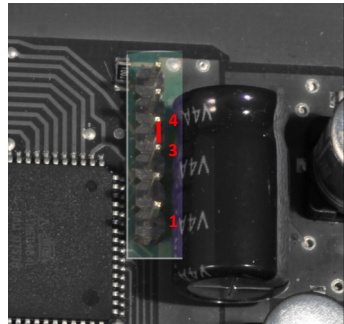
When there is an active link the green LED on the Ethernet connector will light up. The yellow LED flashes when data is transmitted.

By default the IRTrans uses DHCP to acquire an IP Adress. If there is no DHCP Server available the device automatically falls back to **192.168.0.32**.
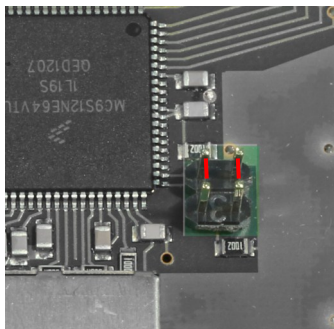
Switching to 10MBit is done by shorting 2 pins with a jumper:
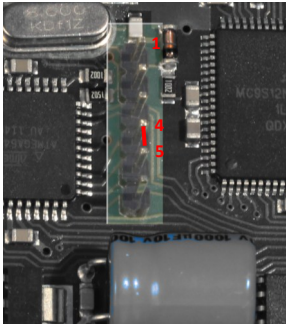


**IRTrans LAN I/O**



**IRTrans LAN Controller / XL / XXL**



**IRTrans LAN Controller Multistream**

**left Jumper: 10MBit**

**Right Jumper: full duplex**

## 7. External IR transmitters

There are a variety of external transmitters available with 3,5mm jacks.

### 7.1 stick on minitransmitters

The minitransmitters can be sticked directly to the IR receiver of the your devices. Please note:

- The transmitter casing is not transparent all the way around. The transmitters will only work when the paper of the sticker is removed.

- Range is limited to 20-30cm (~1ft). The transmitters should be sticked directly to the IR receiver.

- Individual control of multiple external transmitters is not possible with the IRTrans devices covered by this handbook.

- Standard cable length is 1,8m (~6ft). Cables may be extendet to up to 5m (~15ft). Longer cables may cause signal distortions.

- Important: When using external high power transmitters there is a jumper to enable full power. This jumper must be removed when using minitransmitters.

### 7.2 external high power transmitters

The external high power transmitters are equal to the built in IR LEDs. They are available in a high frequency version as well (455kHz). The high frequency transmitters can be recognised by clear LEDs. High power transmitters can be connected to all of the IRTrans devices.
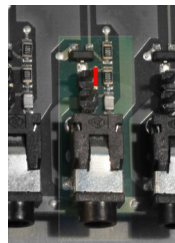Cables should not be extended beyond standard length (1,8m~6ft). Longer cables lead to distorted IR signals.
For using external high power transmitters a jumper has to be set inside the IRTrans. The following pictures illustrate the position of this jumper:
The jumper must not be set when using stick on minitransmitters!
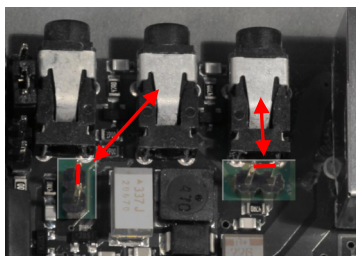


**IRTrans LAN I/O**

**IRTrans LAN Controller / XL / XXL**

## 8. Connecting external receivers

External receivers can be connected by a 3,5mm jack next to the built in IR receiver.

When using an external receiver it must be enabled in the device settings and the correct receiver type has to be selected.

When using external receivers firstly the receiver must be enabled and secondly the correct receiver type has to be selected with the IRTrans software.

## 9. RS232 interface

The IRTrans LAN I/O, LAN Controller XL / XXL and LAN Controller Multistream have a dedicated RS232 port. It can be used without any additional hardware.

It is possible to use the IRTrans Bus connector (RJ12) as a RS232 port. In this case the active RS232 cable is required.

## 10. IRTrans Bus

The IRTrans LAN Controller family is capable of operating with the IRTrans 2 wire bus. It is connected to a RJ12 connector. For basic operation only 2 wires (data and GND) are required. In this case every IRTrans Bus module has to be powered with ist own power supply.

By using a third wire it is possible to distribute power through the IRTrans Bus. The power supply connected to the LAN Controller thes has to be powerful enough to supply all connected modules.

| Signal | Pin IRTrans |
|--------|-------------|
| Data | 5/6 |
| GND | 3/4 |
| +8-16V | 1/2 |
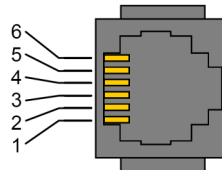
## 11. Relay outputs (only LAN Controller / XL / XXL)

The I/O ports of the LAN Controllers are configured as relay outputs by default. The relays can be controlled by software commands as well as IR. The relays are capable of switching 24V/500mA.

Alternatively the relay outputs can be reconfigured to analogue inputs (0-2,5V).

Set the jumpers accordingly:



**Relay output**



**Analogue input**

## 12. start-up

For configuring the IRTrans Ethernet / PoE there is a password. By default (factory settings) this password is:

<div align="center">

**user: admin**

**password: irtrans**

</div>

The password may be changed in the user interface.

The IRTrans Ethernet / PoE devices ship with DHCP enabled. Hence the IRTrans searches for a DHCP Server and requests an IP adress with its MAC. The MAC adress is printed on the label.

If there is no DHCP server or the server does not assign an IP adress to the IRTrans the device will fall back to the IP adress **192.168.0.32**.

Included in the IRTrans software suite is the tool „IPAssign". It is available both as GUI (Windows) and as console (Windows & Linux). Using IPAssign it is possible to modify the IRTrans IP settings. IPAssign „mimics" a DHCP server for this purpose therefore the DHCP ports must not be blocked by a firewall.
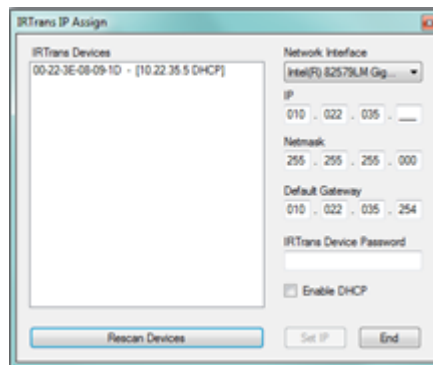
IPAssign searches the network for IRTrans devices and sorts them according to MAC adresses. An entry marked with „DHCP" means that this device obtained ist settings from a DHCP server. After selecting an IRTrans device its settings can be changed. Writing the settings to the device („Set IP") requires the correct device password to be entered

Now knowing the IP adress of the IRTrans the IRTrans server can be started. Additional settings can be modified by the IRTrans servers „device status" dialogue or the devices web interface.
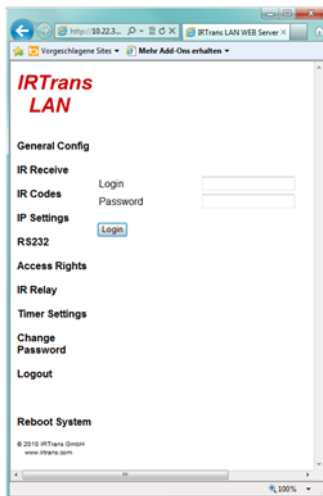
## 13. Webinterface

IRTrans devices with Ethernet offer a browser based configuration interface. All parameters that can be altered by the web interface can be accessed by the IR-Trans servers device status dialogue as well.

To access the web interface simply type the IP adress of the IRTrans in an internet browser:

**http://192.168.0.32**

The adress will chance according to your network settings.

You will now see the Login page:



**IRTrans Webinterface - Login**

The password may be changed by selecting „Change Password". Although access to the IR functions of the IRTrans may be restricted using access rights (refer to software handbook) the webinterface is always reachable from the subnet where the IRTrans is located.

All options accessible through the webinterface are identical to the corresponding options of the device status. For a detailed description refer to the software handbook.

The IP Settings dialog to configure the IP parameter. The following fields are defined:

*Use DHCP*: Activates the automatic IP assignment via DHCP.

*Fallback …*: When no DHCP server is available the device falls back to the default address 192.168.0.32 after 30s.
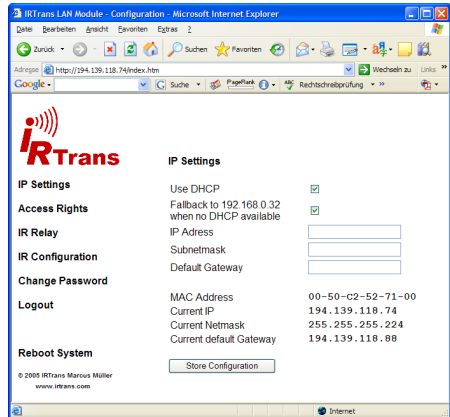
*IP Address*: Manually configured IP address

*Subnet mask*: Manually configured IP subnet mask



*Default Gateway*: Manually configured default gateway

In the lower lines the currently active parameters including the MAC address are displayed.

The button „Store Configuration" transfers all values to the non-volatile EEPROM of the device.

The Access Rights dialog configures the access rights of the device. If no values are entered here, any client can access the device. As soon as at least one value is entered only clients that fit into at least one of the entries are allowed to access the device.

Each entry consists of an IP address and a subnet mask: 192.168.0.0 / 255.255.255.0 enables all clients within the network 192.168.0.x. An entry 192.168.0.1 / 255.255.255.255 allows only one client to use the IRTrans LAN. The access rights are active for all TCP and UDP functions.
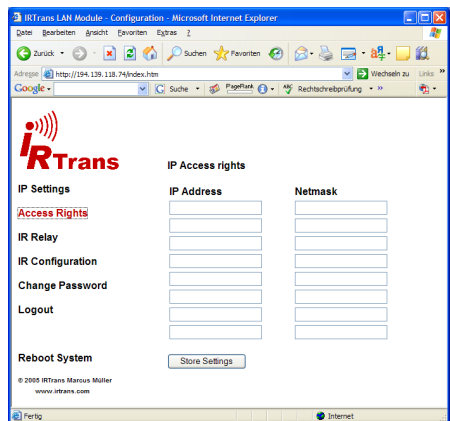


To avoid a complete lock-out it is always possible to access the web front end from within the local network of the device – even if there is no entry for that subnet.

The IR Relay configuration is used to configure the relaying of IR signals from one IRTrans Ethernet to another. In general IR signals received by other IRTrans Ethernet modules will be relayed automatically. This relaying works without a server – even with IRTrans devices without an integrated IR database. The exact configuration of the relaying is done in this dialog.

In the list below "Accept IR Relay from" all IRTrans IP Addresses can be entered from which IR relaying should be enabled. If the list is empty, all signals will be relayed.

The list below "Send IR Relay to" tells the system to which devices received IR codes should be relayed. Normally it is enough to enable the checkbox „Broadcast IR Relay". Only if IR data should be relayed to routed networks it is important to enter a target address because broadcasts will not be routed. The IR receiving of the irserver is also done via that broadcasts. That means either broadcast has to be enabled or the address of the host running the irserver has to be in this list – otherwise the irserver will not receive IR codes from this IRTrans module.



The UDP Broadcast fields are only used for modules with integrated IR Database. They define to which address and port formatted IR receive data has to be sent. The precise format of these telegrams is configured via the IR database.
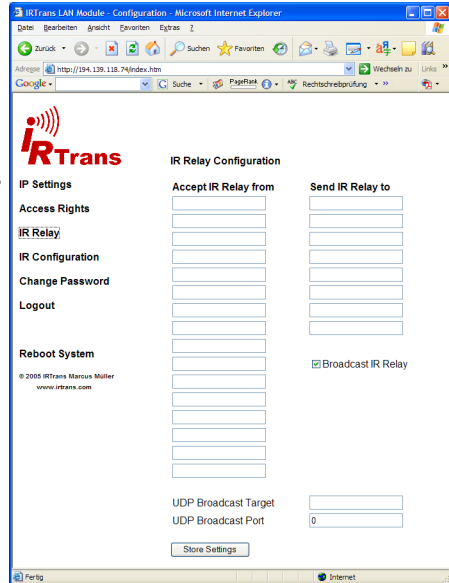
The IR parameters can either be configured using the IRTrans GUI client or via the webpage "IR Configuration".

All the fields and their meanings are explained in detail in the Users manual for the IRTrans system.

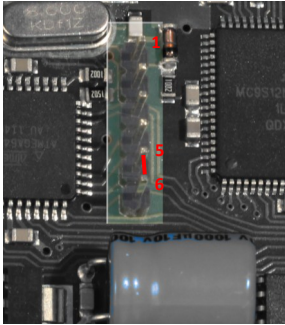Of course both ways of configuration can be used alternately.
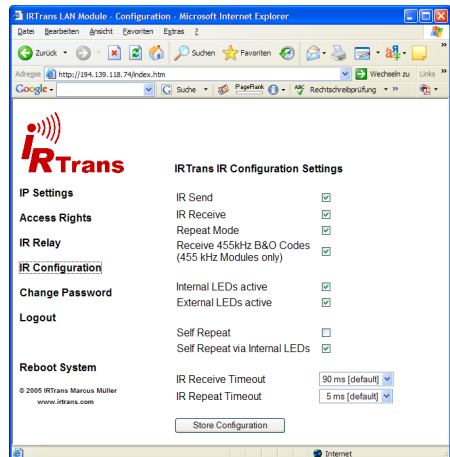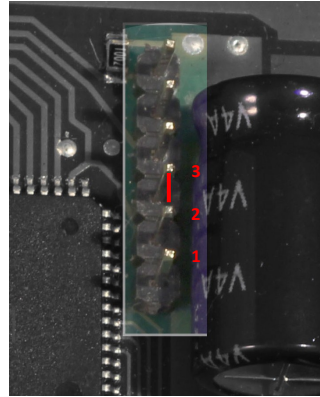
## 14. Reset to factory defaults

If it should become neccessary to reset the IRTrans to factory defaults (e.g. the password has been lost) this can be accomplished as follows:

Remove power from the device and open the case.

Resetting the IRTrans will be done by shorting pins of the 6 pin header inside the device:



**IRTrans LAN I/O**



**IRTrans LAN Controller / XL / XXL**

After putting a jumper on the pins as shown power up the device and wait a few seconds. The status LED will flash green-red once. Now remove power again and remove the jumper. The IRTrans is reset to factory defaults.