Fallguy *ULTRA MP3 player*

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1. Overview

The Fallguy ULTRA MP3 player (LOETRONIC article no. 0175) is an universal audio player for MP3 files and is based upon the Fallguy ULTRA MP3 module by LOETRONIC ®.
Controlling the player can be done either by three buttons on the front or the different digital and analog inputs. The internal firmware of the player can be adapted to the customer needs. The playback behaviour is defined through the programmed firmware. **Please inform yourself about the different configuration possibilities by reading the firmware datasheet! The configuration of the button inputs and the LED outputs deviant from the default must be possibly set up before starting the player!**

In the standard condition of the ULTRA MP3 player the standard firmware is programmed and the 3 D-SUB interfaces are internally configured as described in this datasheet. According to the customer requirements an adapted firmware or another configuration (Firmware + Hardware) can be used! This can differ from the explanations in this datasheet! The button inputs are per default in DIRECT mode (*BU!01*, *GP!02*).

The ULTRA MP3 player can be controlled using the RS232-, the LAN- or USB-interface and a special software by LOETRONIC (*ULTRA Serial Control*, s. www.loetronic.com). The MP3 files themselves can be uploaded and deleted to and from the SD card.

The ULTRA MP3 player consists of the following individual components (LOETRONIC article numbers):

ULTRA MP3 module	-	0132
ULTRA Carrier Board	-	0129
LAN for ULTRA Carrier Board (Optional)	-	0138
USB for ULTRA Carrier Board (Optional)	-	0155
RTC for ULTRA Carrier Board (Optional)	-	0162
ULTRA Casing Kit	-	0130

2. Technical data

Control- and visual elements:
- 3 front buttons
- 4 status LEDs

Interfaces:
- 8 button inputs
- 1 LAN- or USB-interface (XPORT or FTDI-IC, optional)
- 1 RS232-interface (115.200 bps) – Control via Terminal or *ULTRA Serial Control*
- 1 interface for 5 external status LEDs
- 2 audio cinch connectors (Left/Right)
- 1 headphone jack plug (Stereo)

Operating temperature:
- -20 °C to +85 °C

Operating voltage:
- 9-12 Volt (DC) unstabilized

Current consumption:
- 125mA (without connected LC-display / without XPORT or FTDI-IC)

LAN functionality (using the optional XPORT):
- Lantronix XPort
- 10/100 Mbit
- Protocol: TCP/IP, DHCP
- Configurable via webbrowser/telnet or serial interface
- Control via Terminal or *ULTRA Serial Control*

USB functionality (using the optional FTDI-IC):
- FT231XS by FTDI
- Full Speed USB
- Control via Terminal or *ULTRA Serial Control*

Dimensions:
- 105x115x52mm (WxDxH)

3. Connection possibilities

Buttons T1, T2, T3

- The buttons control the ULTRA MP3 player. The assignment is defined though the standard firmware on the ULTRA MP3 player.

Assignment:

Button	Name	Function
T1	Button 1 Front	Play/Pause or start Bootloader
T2	Button 2 Front	Stop
T3	Button 3 Front	Next Track

Status LEDs Power, Bootloader, Flashcard, Network

- The status LEDs display important status information.

Assignment:

Light emitting diode	Name	When does the LED light up?
LED_POWER	Power-LED	By powering the player
LED_BOOTLOADER	Bootloader-LED	By using the bootloader function
LED_FLASH_CARD	Flashcard-LED	At SD card activity (Playback/Record of MP3-files or MP3 upload)
LED_NETWORK	Network-LED	At network activity (RS232-, RS485- or LAN- or USB-interface)

D-SUB interface BUTTON/MATRIX

- The D-SUB interface BUTTON/MATRIX is for connecting up to eight buttons, relais or sensors. The assignment is defined though the standard firmware on the ULTRA MP3 player.
- To activate an input it must be bridged with ground.
- The button inputs are per default in DIRECT mode (*BU!01*, *GP!02*).

Assignment:

Pin-No.	Name	Description
1	BUTTON_4	Button input 1 (Start of 1. MP3 file)
2	BUTTON_5	Button input 1 (Start of 2. MP3 file)
3	BUTTON_6	Button input 1 (Start of 3. MP3 file)
4	BUTTON_7	Button input 1 (Start of 4. MP3 file)
5	BUTTON_8	Button input 1 (Start of 5. MP3 file)
6	GPIO_1	Button input 1 (Start of 6. MP3 file)
7	GPIO_2	Button input 1 (Start of 7. MP3 file)
8	GPIO_3	Button input 1 (Start of 8. MP3 file)
9	GND	GND

D-SUB interface LED/GPIO

- The D-SUB interface LED/GPIO is for connecting five external LEDs. The function of these LEDs is defined though the standard firmware on the ULTRA MP3 player.
- The LED outputs already have series resistors of 220 Ohm each.
- **All LED outputs have 0 – 3,3 Volt level!**

Assignment:

Pin-No.	Name	Description
1	LED_EXT1 K	External LED 1 – Cathode
2	LED_EXT2 K	External LED 2 – Cathode
3	LED_EXT3 K	External LED 3 – Cathode
4	LED_EXT4 K	External LED 4 – Cathode
5	LED_EXT5 K	External LED 5 – Cathode
6	LED_EXT1 A	External LED 1 – Anode
7	LED_EXT2 A	External LED 2 – Anode
8	LED_EXT3 A	External LED 3 – Anode
9	LED_EXT4 A	External LED 4 – Anode

D-SUB interface RS232/RS485/CAN

- The D-SUB interface RS232/RS485/CAN is for connecting the ULTRA MP3 player to an external PC or microcontroller using the well known RS232-interface. The voltage level of this serial interface is conform to RS232.
- This serial interface (UART 1) is set to **115.200 bps with 8N1** (8 data bits, 1 stop bit, no parity) in the standard firmware of the ULTRA MP3 player. Furthermore a hardware handshake is set (**Hardware handshake RTS/CTS**) permanently.
- The ASCII based protocol used by the RS232 interface is defined in the standard firmware and is described inside the datasheet for this firmware.

Assignment:

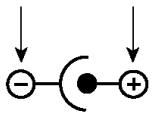
Pin-No.	Name	Description
1	GND	Ground
2	RS232_RX	Receive line of the ULTRA MP3 player
3	RS232_TX	Send line of the ULTRA MP3 player
4	N.C.	Not connected
5	GND	Ground
6	N.C.	Not connected
7	RS232_RTS	Hardware handshake – „Receive to Send“ of the ULTRA MP3 player
8	RS232_CTS	Hardware handshake – „Clear to Send“ of the ULTRA MP3 player
9	5V	5 Volt power supply for external devices

LAN / USB socket

- Via the LAN-interface and the XPORT the ULTRA MP3 player can be connected to a Local Area Network (LAN). The configuration of the XPort is described inside chapter 4 of this datasheet.
- Via the USB-interface and the FTDI-IC the ULTRA MP3 player can be connected to a PC. Appropriate USB driver can be downloaded from the website (*ULTRA Serial Control* software, www.loetronic.com).
- For controlling the player an ASCII protocol is used, which is identical to the ASCII protocol of the serial interface (RS232). The ASCII based protocol is defined in the standard firmware and is described inside the datasheet for this firmware.

DC socket

- The ULTRA MP3 player is supplied with 9-12 Volt (DC) through this socket.
- **A wrong polarity can damage the player!**



Cinch sockets L and R

- By using the cinch sockets L and R the ULTRA MP3 player can be connected to an external amplifier. Both audio outputs have line level.

3,5mm headphone jack plug

- By using the stereo jack plug a stereo headphone can be connected to the ULTRA MP3 player.

4. Getting started

The Fallguy ULTRA MP3 player must be connected to a voltage source of 9-12 Volt (DC). An external amplifier can be connected to the cinch sockets L and R, a headphone to the jack plug.

Any SD flashcard – type SD or SDHC - can be used. The SD card must be formatted in **FAT32** with standard settings and there must only be one partition on it.

Except the LAN-interface all interfaces are described in chapter 3 of this datasheet. The LAN-interface (XPORT) is described here more detailed:
By using the LAN-interface the ULTRA MP3 player can be connected to a Local Area Network (LAN). The component XPort by Lantronix used for this purpose communicates between the ULTRA MP3 player and the LAN.
The XPort must be set to a static and valid IP address and subnet mask or must get its address via DHCP from a DHCP server. Per default the player is set to a static address and subnet mask(**192.168.0.200, 255.255.255.0**). The user can test, whether the server is correctly connected to the player by using the *ping* command on the server.

Furthermore the serial interface of the XPort and some more TCP settings must be configured. Per default all settings are ready. If anything must be changed, the web browser or a Telnet-Communication is used (DeviceInstaller). The player has to be connected to a network and the IP address of the XPort has to be entered into the web browser. Is there any address conflict in the network, the software DeviceInstaller from Lantronix must be started and the IP address must be changed through the DeviceInstaller.

After entering the XPort through the web browser a username and a password are necessary. Per default these settings are empty. The following settings are important:

Expert (Telnet)	-	CPU performance: High
Network	-	DHCP oder statische IP
Channel 1 – Serial Settings	-	Baud Rate 921600, FlowControl CTS/RTS (Hardware)
Configurable Pins	-	CP0 Flow Control Out (CTS) Low
		CP2 Flow Control In (RTS) Low

After changing any setting the button *Apply Settings* has to be pressed. The XPort saves the new settings and reboots then. This can take some seconds.

If it is not possible to configure the XPort through the web browser or Telnet, it is also possible to use the RS232-interface.

Before the MP3 player is supplied with power, the second and third button have to be pressed simultaneously (T2 and T3). After powering the player up, there should be some XPort messages on the terminal window on the connected PC. Now the XPort could be new configured using the terminal software. The configuration of the XPort via a terminal is described in the datasheet of the XPort (*XPort User Guide*, *Chapter 6: Setup Mode: Server Configuration*).

5. Firmware updates with the integrated bootloader

To program a new firmware file into the internal flash memory of the ULTRA MP3 player, the firmware file (*.LOE) must be in the main directory of the SD card. There must be only one firmware file in the main directory!
Deleting and programming the internal flash memory is done by the internal bootloader of the ULTRA MP3 player. The player has to be turned off, then the first button (**T1 / Play/Pause**) must be pressed and then it must be turned on with the button pressed down. The player will now boot up the bootloader and the Bootloader-LED will light up. The programming sequence is automatically initiated, this means the player reads the firmware file in the main directory (*.LOE), erases the memory and programs it with the new firmware. As it is ready, the player will boot up the new firmware and the Bootloader-LED will go off.

To display errors and to diagnose them, the Bootloader-LED is used. It will blink every 0,5 s up, if there was a problem initialising the SD card or programming the flash memory. The counts of blinking up represent the error and will repeated every 3 s.

Error messages ULTRA BOOTLOADER:

1 – Sector cannot be erased -> Player is broken
3 – Sector cannot be programmed -> Player is broken
5 – Firmware file (*.LOE) on the SD card is corrupted
6 – Partitition signature (FAT32) not found -> SD card has to be reformatted
8 – Partitition table (FAT32) not ok -> SD card has to be reformatted
9 – Firmware file (*.LOE) not found in main directory of the SD card
11 – SD card is not available