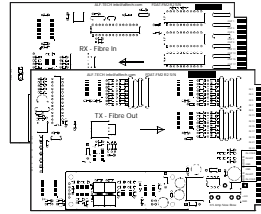




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FDAT-FM2

Fibre Digital Audio Transceiver

FDAT-FM2

HARDWARE FEATURES

- **2 channels balanced audio (optionally 4)**
- **24 inputs to transistor pull down outputs**
- **Line Fault transistor pull down output on RX**
- **Audio level indicator for setup on TX**

TRANSMITTER CONNECTIONS

- **24 V DC supply input**
- **24 inputs**
- **2 Balanced audio line-inputs (optionally 4)**
- **Optic-Fiber output**

TRANSMITTER INDICATORS

- **Power LED**
- **5 Input level Indicator LED's**

DESCRIPTION

The FDAT-TX FM2 is an audio-data fibre optic transmitter, in a Frame Mount form factor. Two audio channels and 24 digital inputs are transmitted to the FDAT-RX Receiver. The FDAT-RX Receiver card will indicate if a valid link is maintained, and if not, a fault output will be activated. The audio will be muted, and all outputs will be switched off.

RECEIVER CONNECTIONS

- **24 V DC supply input**
- **24 pull down transistor outputs**
- **System fault pull down transistor output**
- **2 Balanced audio line-outputs (optionally 4)**
- **Optic-Fiber input**

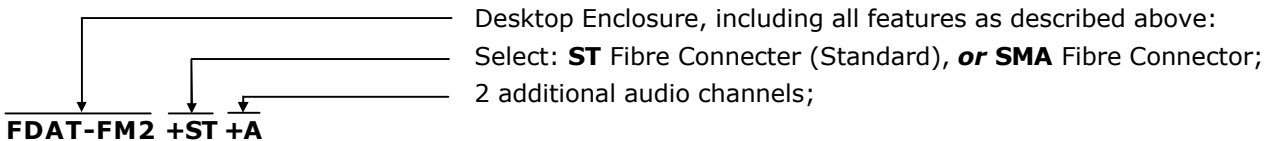
RECEIVER INDICATORS

- **Power LED**
- **Data SYNC LED**

HARDWARE ORDERING OPTIONS

Part Number

Description



FDAT-FM2 DATASHEET AUGUST 2004

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FDAT-FM2 Transceivers Specifications

RECOMMENDED OPERATING CONDITIONS

(0° C to + 55 °C)

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS	NOTES
Supply Voltage		20	24	28	V	
Signal Input Voltage		0		28	V	

ABSOLUTE MAXIMUM RATINGS *

Voltage on V Supply, Relative to Ground	0 V	to	+34 V
Voltage on Signal input pins, Relative to Ground	-60 V	to	+60 V
Operating Temperature	0 °C	to	+70 °C
Storage Temperature	5 °C	to	+55 °C

* Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

ELECTRICAL CHARACTERISTICS

(Over the Operating Range)

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS	NOTES
Supply Current	24V DC - TX card		75		mA	1
	24V DC - RX card		90		mA	2
Trigger input Current	Input pulled to ground		5		mA	
Trigger input resistance	From 24V to trigger		~4.7		kΩ	
Trigger HIGH level Voltage		21			V	3
Trigger LOW level Voltage				3	V	3
Trigger input to output delay				10	ms	4
Relay output Current	Transistor output pull down			500	mA	5
Audio Input and Output Level	0 dB LED turns ON		+4		dBu	6
Audio gain	Input to output	-0.25	0	+0.25	dB	
Audio headroom			7		dB	7
Audio sample rate			±44.5		kHz	
Audio resolution			24		Bits	
Audio input impedance	TX card (differential)		24		kΩ	
Audio output impedance	RX card (differential)		44		Ω	
Frequency response	± 0.3 dB	20		20k	Hz	
Inter channel gain difference			±0.25		dB	
LED indicator accuracy			±0.5		dB	
Cross talk	1kHz			>80	dB	
Total Harmonic Distortion	+10dBu (1kHz)			<0.002	%	

NOTES

- No audio input, and all triggers off. For every trigger another approx 5mA must be added.
- The current is the supply current through the +24 V supply line. If all outputs are ON, the supply current should increase by less than 10 mA. This is because the relay outputs are pulled down, thus the relay current goes through the GND terminal.
- The Signal input voltage should never be allowed to be between the maximum LOW-level, and the minimum HIGH-level input voltage.
- Delay from when the TX card received a trigger input, to until the RX card's output switches ON or OFF.
- The relay outputs are in 3 banks of 8 outputs each. If all 8 outputs per bank are ON permanently, they are each allowed to draw only 125 mA. Only use 24 V relays, with a resistance of more than 200 ohm. Each relay output has a 22 k pull-up resistor and a protection diode connected directly to the 24 V supply.
- The input and output level are between the hot and cold terminals.
- Extra output level available before the output clips after the input level has reached the 0 dB level. Thus the output will clip at +11 dBu.

CAUTIONS

The output transistors do all have diode protection, but the outputs can still be damaged if care is not taken. When a relay is disconnected while an output transistor is on, and the relay has no diode directly connected to it, the relay will generate a high voltage oscillation, arcing over the point where contact was broken. This reverse voltage will flow back to the transistor and can damage it.

Audio Inputs

The audio receiver uses a differential line receiver IC for the balanced inputs. For balanced inputs care must be taken to make sure the input impedance of the driver and cable is balanced. Just a few ohms can degrade the common mode rejection ratio considerably. If the inputs are driven by an unbalanced source, the input must be connected to the HOT input, and the COLD input must be grounded on the connector of the board.

The input must be balanced around the ground for best performance. If the board and the source are both grounded, the audio cable ground can be disconnected on the one end. Shielded twisted-pair cable is recommended for all applications. The screen must still be connected on the other end. This will avoid ground loops. All equipment must always be grounded to the safety ground of the building. Follow industry practices for proper system grounding of the cables.

Input Levels

The LED display on the TX card can be used to set the input levels. At any moment, the input with the highest input level will be displayed. When the 0dB LED lit up, the input level is +4dBu. The input has another 7dB of headroom, thus the signal will clip at +11dBu. For best audio performance the input level must be kept as high as possible without clipping the signal. The lower the signal, the lower the signal-to-noise ratio (SNR), and thus the higher the distortion. The LED'S are for indication only, and must not be used for level measurement.

Outputs

The outputs are balanced, and impedance matched. The 2 outputs are both driven out of phase. They are not floating like a transformer output. If an unbalanced output is required, connect the ground to ground, and the signal to the HOT output. Leave the COLD terminal open. This will however give half the output level than a balanced output. The outputs can easily drive the large capacitive loads associated with long audio cables.

Electrostatic Discharge

The inputs and outputs can be damaged by electrostatic discharge, thus care must be taken when handling the boards. Failure to observe proper handling and installation procedures can cause damage. Electrostatic Discharge damage can range from performance degradation to complete hardware failure.

DETAILED PIN DESCRIPTIONS - TRANSMITTER

Pin Number	Description COMPONENT SIDE	Pin Number	Description COMPONENT SIDE	Pin Number	Description SOLDER SIDE	Pin Number	Description SOLDER SIDE
A	Input 1	N	Input 23	1	Input 2	12	Input 24
B	Input 3	P	B Audio In Cold	2	Input 4	13	
C	Input 5	R	B Audio In Hot	3	Input 6	14	
D	Input 7	S	B Audio Ground	4	Input 8	15	
E	Input 9	T	A Audio Ground	5	Input 10	16	
F	Input 11	U	A Audio In Hot	6	Input 12	17	
H	Input 13	V	A Audio In Cold	7	Input 14	18	
J	Input 15	W		8	Input 16	19	
K	Input 17	X		9	Input 18	20	
L	Input 19	Y	24 V Supply	10	Input 20	21	24 V Supply
M	Input 21	Z	Ground	11	Input 22	22	Ground

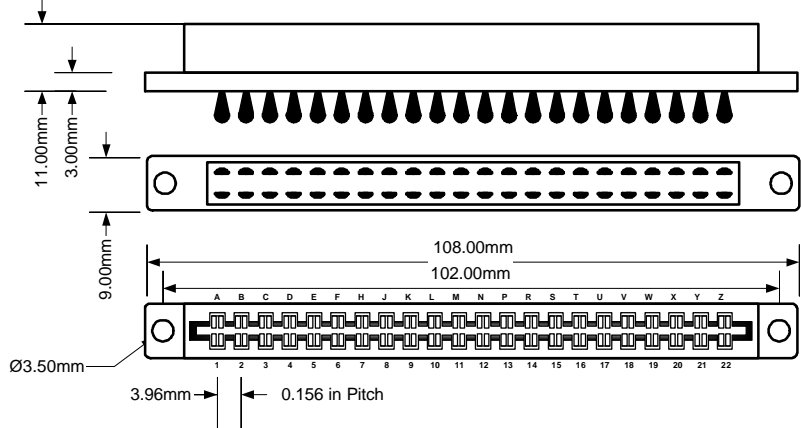
DETAILED PIN DESCRIPTIONS - RECEIVER

Pin Number	Description COMPONENT SIDE	Pin Number	Description COMPONENT SIDE	Pin Number	Description SOLDER SIDE	Pin Number	Description SOLDER SIDE
A	Output 1	N	Output 23	1	Output 2	12	Output 24
B	Output 3	P	Fault Output	2	Output 4	13	B Audio Out Cold
C	Output 5	R		3	Output 6	14	B Audio Out Hot
D	Output 7	S		4	Output 8	15	B Audio Ground
E	Output 9	T		5	Output 10	16	A Audio Ground
F	Output 11	U		6	Output 12	17	A Audio Out Hot
H	Output 13	V		7	Output 14	18	A Audio Out Cold
J	Output 15	W		8	Output 16	19	
K	Output 17	X		9	Output 18	20	
L	Output 19	Y	24 V Supply	10	Output 20	21	24 V Supply
M	Output 21	Z	Ground	11	Output 22	22	Ground

Physical Connection

0.156 inch PCB Edge Connector (Not Supplied)

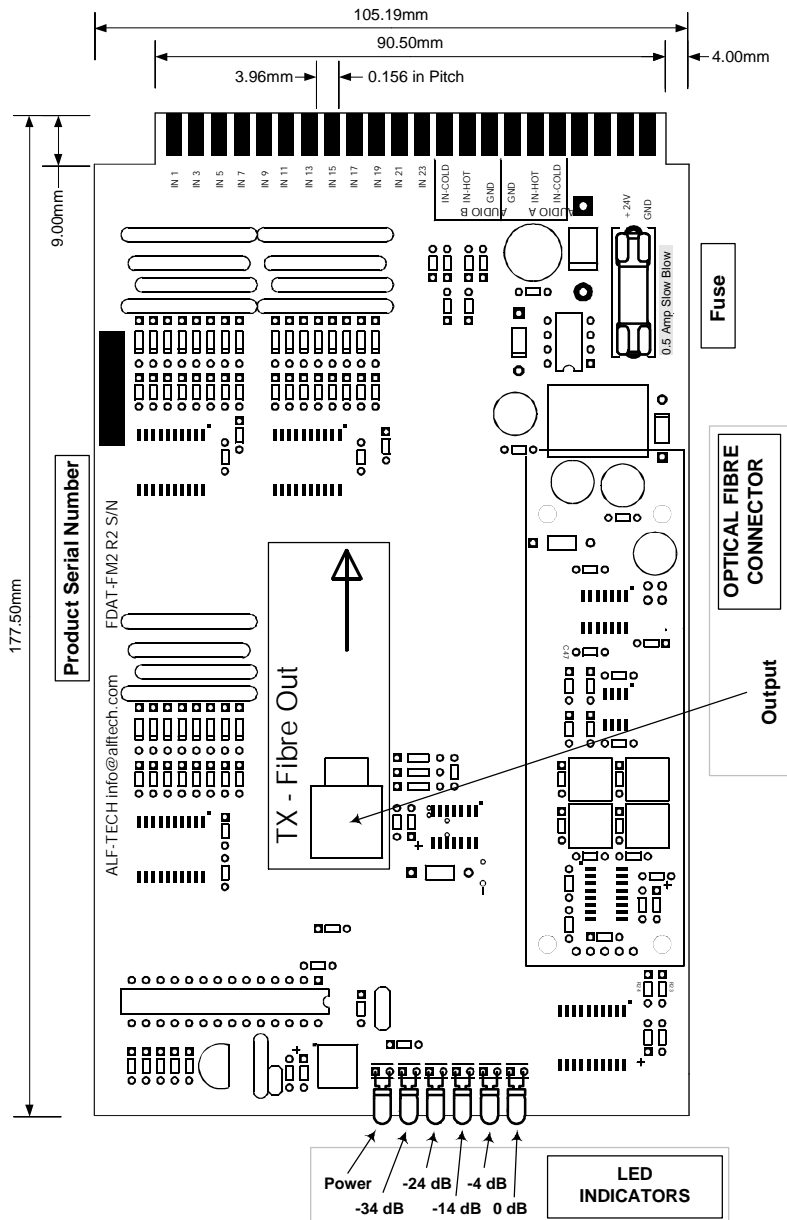
A 22-way double-sided 0.156 in. (3.96 mm) pitch edge connector with solder tag terminations and gold plated contacts is used in Frame Mount Applications.



Physical Layout and Dimensions

FDAT TX FM2 Transmitter

(All Dimensions in mm)



FDAT RX FM2 Receiver

(All Dimensions in mm)

