HFM5000-E06/E16, -E07/E17

RS232/V24 Module

- Low cost version
- Extends RS232C link length to 1,000 meters (3,281 feet)
- Optical isolation of grounds
- EMI/RFI resistant
- Full duplex, asynchronous, DC to 56 kB/s data rate
- Plugs directly into 25 pin connector on computers, peripherals, etc.
- DCE or DTE switchable
- Power provided by AC power cube or thru 25 pin connector
- Interfaces to standard RS232C/V24 Drivers/Receivers,

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OUTLINE DIMENSIONS in mm

DESCRIPTION

The Honeywell Fiber Optic RS232C link is a plug compatible replacement for most 4 and 9 wire EIA RS232C extension cables. This link provides an effective way of extending cables beyond the 50 feet limit of a standard RS232C while providing EMI/RFI resistance,, data security, reduced error rate,, and elimination of ground loops. The modules support full duplex asynchronous data rates from DC to 56 kB/s with less than ±3 µs. pulse width distortion over the operating temperature range of -20°C to +70°C.
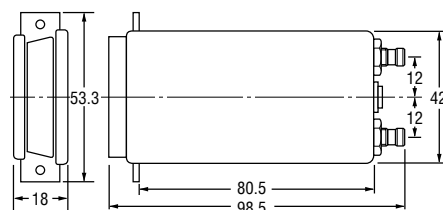
Full duplex communication is provided when modules are interconnected with a duplex fiber optic cable. The recommended duplex fiber optic cable for the -EO6 and -EO7 version is a 200 µm core PCS type or equivalent. The -E16 and -E17 version is made to use a 50/125 µm glasfiber or equivalent.

The module's metal housing and cover combined with its conductive black finish are electrically connected to the 25 pin connector shell to form an RF shield. This unique feature significantly reduces RF radiation and susceptibility to electromagnetic interference.

When connected to the user's equipment, the module greatly attenuates RF radiation and susceptibility through the user equipment's 25 pin connector.

Another unique feature of the module is the DCE/DTE jumpers. These jumpers provide the user with one module type for both DTE and DCE equipment without any additional changes. In addition, a separate portion of these jumpers allows case ground to be connected to signal ground, if required.

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Notes
1. Fiber optic receptable is 9 mm SMA.

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DESCRIPTION (continued)
Another unique feature of this module is its capability to operate either with power cube or through the 25 pin DIP connector:
+12 V: Pin 9 and/or pin 18
-12 V: Pin 10 and/or pin 25

APPLICATION
Each Module is tested with 16 dB for 200 μm fiber and 10 dB for 50/125 μm fiber of optical loss between the transmitter and receiver.

The recommended allocation for 16 dB is 10 dB for cable loss and 6 dB for excess margin. This excess margin allows up to 3 dB LED degradation, 1.5 dB for sensitivity variations over temperature, and 1.5 dB for connector mis-alignment.

The HFM5000-E module can operate with either DCE or DTE configured equipment. Selection is accomplished with jumpers located inside the module. A jumper for connecting or isolating signal and case ground is also located inside the module. Access to the jumpers is accomplished by removal of the cover screw and then the cover. Positioning the jumper is the direction indicated on the cover activates that position. The units are delivered in DTE position.
The fiber connected to the "T" optical port (transmitter output) must be connected to the "R" optical port at the opposite link end.

APPLICABILITY TO EIA RS232C
The EIA RS232C standard describes the interface between Data Terminal Equipment (DTE) and Data Communications Equipment (DCE) employing serial binary data interchange. Typically the DTE's are terminals, computers, and peripherals, while DCE's are typically modems.

Prior to the anti-trust decision involving AT&T, the modems developed for AT&T were de-facto industry standards. When modems were supplied by independent manufacturers, the need for a standardized computer/modem and terminal/modem interface became evident. The RS232C standard resulted from the co-operative efforts of the EIA, the Bell System, modem manufacturers, and the computer and terminal manufacturers.

Once the RS232C port was available on computers and terminals, it was applied not only to remote data communications over the telephone network, but also was used for local communications between computers and peripherals. The application of RS232C to local links has produced RS232C "compatible" links.

In a local link, both computers and terminals are DTE's and they are linked together without modems. To satisfy this local link requirement and still meet the RS232C standard requires that either the terminal or the computer be modified to appear to be a DCE; or, the "standard" cable requires modification to accept DTE's on both ends. Cable modification is the most pervasive alternative used and thus "plug compatible" RS232C links are widely available. Variations do exist, and the Honeywell Fiber Optic RS232C link has been designated to easily accommodate these variations.

The HFM5000-E module does not support all the signals required to interface to a standard RS232C switched network modem. Examine the Block Diagram carefully to determine if enough control signals are provided to support specific applications.

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ELECTRO-OPTICAL CHARACTERISTICS
(Values shown apply over ranges given in recommended operating conditions unless otherwise noted)
TC = 25°C, for TYP values

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Transmitter Peak Output Power [1] [2]	P_{PO}		150		µW	Coupled into fiber 200 mm, 0.16 NA, glass [1] (HOCZ0202)
			15			50/125 µm, 0.2 NA, [2] (HOC0051)
Receiver Sensitivity	P_{IN}		3		µW	
Data Rate		0		56	kb/s	NRZ Data
Receiver Output Pulse Width Distortion	t_{PWD}	-3		+3	µs	Difference of pulse widths measured at 50% amplitude of transmitter input and receiver output
Receiver Output Voltage	V_{OUT}					
Mark ("1")		-5 V	-8 V		V	V_{IN} = -3 V
Space ("0")		+5 V	+8 V		V	V_{IN} = -3 V
Power Jack input	V_C		±12		V	
Voltage	$I_C(+)$		90		mA	
Current	$I_C(-)$		10		mA	
Bit Error Rate	BER	10^{-9}			-	≥3 µW input receiver
Peak Output Wavelength	λp	800	820	850	nm	T_C = 25°C

Notes
1. LED is HFE4020-013, receiver is SD4324-002. See those data sheet for characteristics
2. LED is HFE4000-013, receiver is SD4324-002.

ABSOLUTE MAXIMUM RATINGS

MODULE (HFM5000-E)
Storage Temperature	-55°C to 70°C
Case Operating Temperature T_C	-20°C to 70°C
Power Jack DC Input	±15 V
Voltage between any	
2 pins in 25 pin conn.	30V

CUBE POWER SUPPLY (SPX5137-E)
Storage Temperature	-55°C to 70°C
Case Operating Temperature T_C	-20°C to 70°C
AC Input Voltage	230 V
DC Output Current	+12 V 100 mA
	-12 V 30 mA

RECOMMENDED OPERATING CONDITIONS

MODULE (HFM5000-E)
Case Operating Temperature T_C	-20°C to 70°C
Power Jack DC input	±12 V
Input Voltage (Transmitter) V_{IN}	±3 kΩ
Optical Attentuation (Cable Loss)	
200 µm	10 dB max.
50/125 µm	3.5 dB max.

CUBE SUPPLY (SPX5137-E)
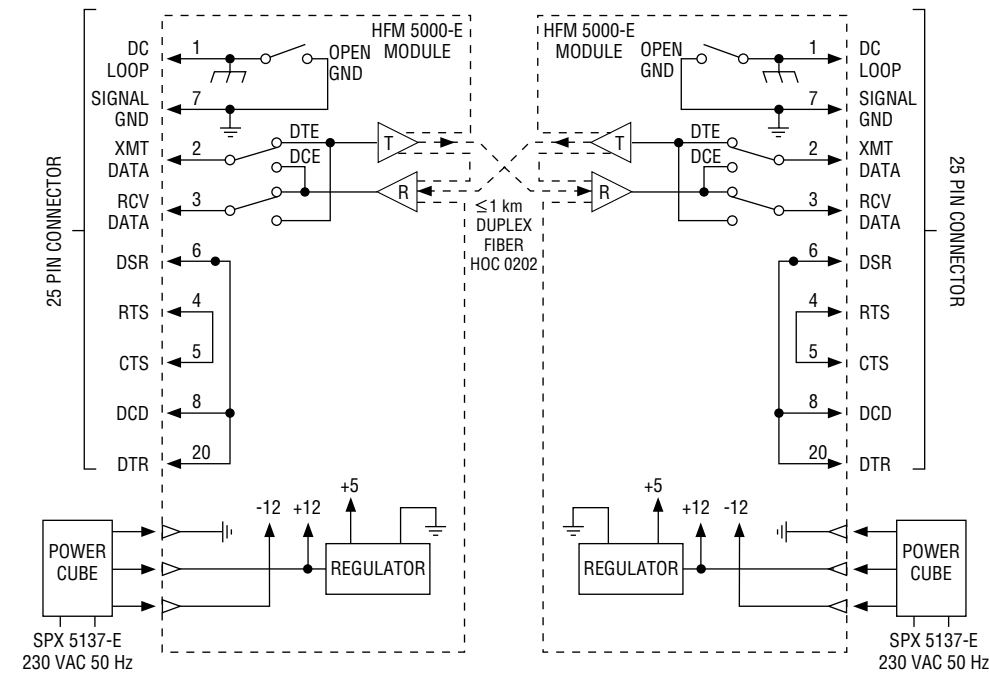|	
Case Operating Temperature	-20°C to 70°C
AC Input Voltage	230 ±10% 50 Hz
DC Output Current	+12 V 90 mA
	-12 V 10 mA

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BLOCK DIAGRAM

| Pin#	Name	Definition/Comments	Pin#	Name	Definition/Comments
P1-1	Case Ground	Can be connected to Signal Ground (P1-7) if the OPEN-GND jumper is in the GND position	P1-5	Clear to send	Jumpered to P1-4 (request to send)
			P1-6	Data Set Ready	Jumpered to P1-8 and P1-20
			P1-7	Signal Ground	See P1-1
P1-2	Transmit Data	DTE position - Module accepts asynchrounous data to 56 kb/s	P1-8	Receive line Signal Detect	Jumpered to P1-20 and P1-6 (Data Terminal Ready)
			P1-9		Reserved for +12 V
		DCE position - Module outputs data	P1-10		Reserved for -12 V
P1-3	Receive Data	DTE position - Module outputs data	P1-20	Data Terminal Ready	Jumpered to P1-8 (Receive Line Signal Detect)
		DCE position - Module accepts asynchrounous data to 56 kb/s	P1-18	Unassigned	Reserved for +12 V
			P1-25	Unassigned	Reserved for -12 V
P1-4	Request to send	Jumpered to P1-5 (clear to send)			

Notes:
1. Connector is standard subminature D type 25 pin connector.
   Male pin version is Souriau part # DB25P 964 or equivalent.
   Female pin version Souriau part # DB25S 964 or equivalent.
2. Pins not listed are not internally connected in the module.

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RS232/V24 Module

ORDERING INFORMATION

HFM5000-E06/E16 The standard module with 25 pin connector and 9 mm SMA 905 connectors for the duplex optic cable.

HFM5000-E07/E17 The standard module with female 25 pin connector and 9 mm SMA connectors for the duplex optic cable.

ST® connector on request

CUBE POWER SUPPLY

SPX 5137-E The special cube power supply with 230 VAC (Europe plug).

Duplex Cable HOC 0202 is suitable for the modules HFM5000-E06 and -E07.

Duplex Cable HOC 0052 is suitable for the modules HFM5000-E16 and -E17.

HOC 0XX2 - 150 m

20 = 200 µm PCS
05 = 50/125 µm Glass

Length in meters

Duplex
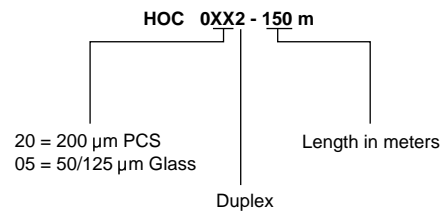
Any length (full meters only) up to 1000 m, terminated with 9 mm SMA Type connectors is available. Other Fiber Optic cables on request.

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