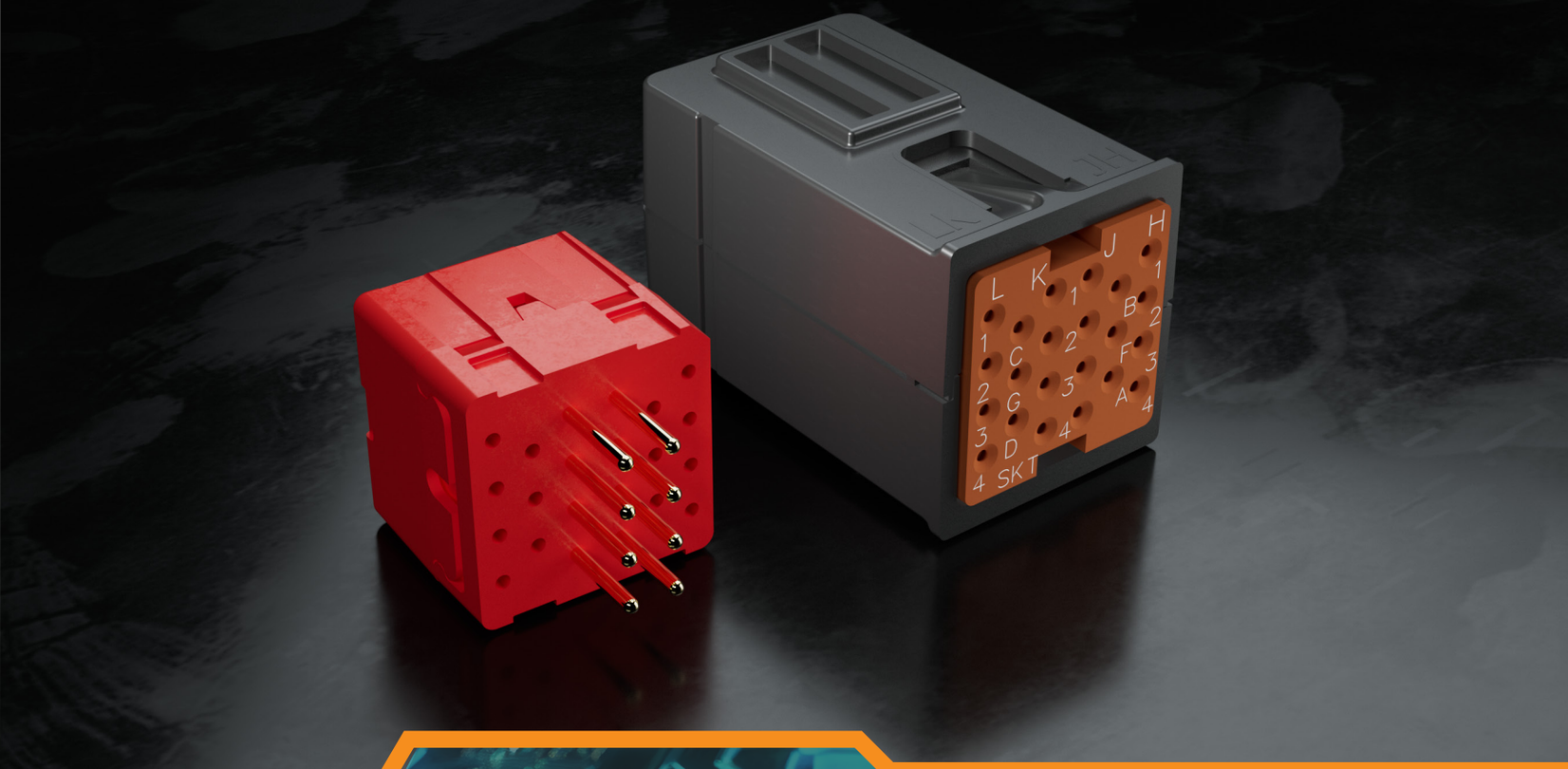
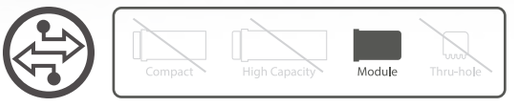
NEXSYS®

RS232/RS422 Transceiver Module



Manufactured by
Applied Avionics

RS232/RS422 Transceiver Module



Summary Description

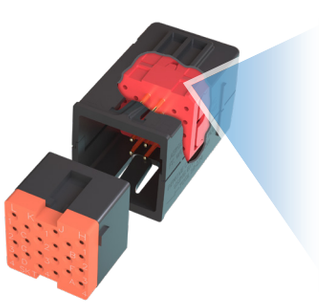
The NEXSYS RS232/RS422 Transceiver Module is a standalone, bidirectional device designed to interface with the NEXSYS LYNK Integrated Signal Processor (ISP) for seamless data exchange, robust signal integrity, and exceptional reliability in demanding aviation environments. The module can transmit and receive signals between RS232 and RS422 data buses, supporting protocol communication at data rates from 2,400 bps to 115.2 kbps.

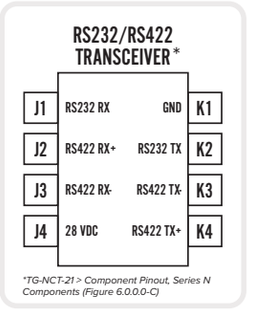
Engineered to meet rigorous avionics standards, this high-reliability transceiver preserves signal integrity and ensures consistent performance under extreme conditions, complying with MIL-PRF-22885/116 and RTCA/DO-160G specifications. With a propagation delay of less than 1.6 µs, it delivers reliable, industry-leading signal performance and precise speed matching, making it ideal for integration into time-sensitive aviation systems.

Standard Characteristics

Designed for reliable operation in demanding aerospace environments with the following interface options.

28V: Operating voltage (nom.), 8 mA current draw (max.)
GND: Dedicated ground connection required for stable operation
RS232 RX: Receive connection
RS232 TX: Transmit connection
RS422 RX(+): Receive, positive connection (differential)
RS422 RX(-): Receive, negative connection (differential)
RS422 TX(+): Transmit, positive connection (differential)
RS422 TX(-): Transmit, negative connection (differential)





*TG-NCT-21 > Component Pinout, Series N Components (Figure 6.0.0.0-C)

Configuration Options

Engineered to interface with NEXSYS product lines, the module uses a 22-pin CTS connector and supports direct integration with NEXSYS Component Technology devices and especially NEXSYS LYNK Integrated Signal Processors (ISP).

RS232 Characteristics
Industry-standard (EIA/TIA-232-E) RS232 interface specifications.

Characteristic	Conditions	Minimum	Nominal	Maximum
Input Resistance	Operation	3kΩ	5kΩ	7kΩ
Input Resistance	Input power = 0V	6kΩ	11kΩ	16kΩ
Input Hysteresis	-		0.5V	-
Output Voltage Swing	-	±5V	±5.5V	-
Output Short-Circuit Current	RS232 TX = Ground	-	±30 mA	±60 mA
Data Rate	R_L = 3kΩ, C_L = 1000pF	2400 bps	-	115.2 kbps
Cable Length	-	-	-	30m/100ft

RS422 Characteristics
Industry-standard RS422 interface specifications.

Characteristic	Conditions	Minimum	Nominal	Maximum
Input Resistance	-7V < VCM < +12V	96kΩ	-	-
Input Hysteresis	-	-	30 mV	-
Output Voltage Swing	-	±5V	±5.5V	-
Output Short-Circuit Current	RS232 TX = Ground	-	±30 mA	±60 mA
Differential Output Voltage (VOD)	R=50Ω (RS-422)	2	-	-
RTS	Voltage Input High (VIH)	2.4V	-	-
	Voltage Input Low (VIL)	-	-	0.8V
Data Rate	R_L = 3kΩ, C_L = 1000pF	2400 bps	-	115.2 kbps
Cable Length	-	-	-	300m/1000ft

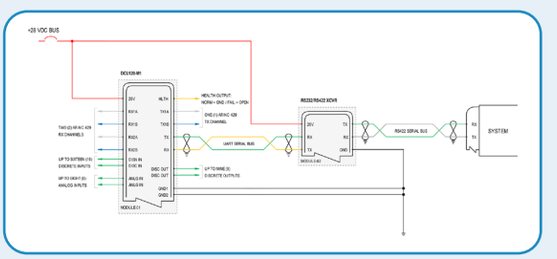
Application Example

NEXSYS LYNK ISP to NEXSYS Tranceiver (XCVR)

Designed for avionics, the RS232/RS422 Tranceiver enhances data bus communication within aircraft systems, facilitating efficient integration between cockpit, cabin, and other support systems. This Serial Transceiver provides robust data handling capabilities while maintaining signal integrity across both RS232 and RS422 interfaces, ensuring consistent signal translation and reliable data transmission essential for operation. Excelling in critical aviation applications, such as aircraft smoke detection systems where dependable data communication is crucial, the Transceiver Module seamless interaction between different serial interfaces. For assistance with your specific application, please contact AAI's Applications and Systems Engineering team today!

Smoke Detection System Example: Message ID (1 byte), Timestamp (4 bytes), Sensor Data (30 bytes, 10 sensors x 3 bytes each), Checksum (1 byte).

Example Message: 01 60 E5 7A 00 34 89 12 45 2B 78 34 67 00 91 AC 34 00 F2 11 8A 56 D4 7C 23 19 E8 01 2A 49 6D 00 54 7F



Scan for Full Details

NEXSYS® Module

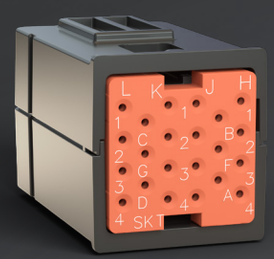
The NEXSYS RS232/RS422 Transceiver is housed inside a NEXSYS Module. The NEXSYS Module is a ruggedized, small form-factor enclosure that allows avionics system designers to create custom behind-the-panel avionics solutions.

NEXSYS Modules can replace the expense and certification delays that are typically encountered when creating a circuit board to solve design challenges. With three different mounting options, NEXSYS Modules deliver a powerful combination of configurable electronic components in a single robust package designed and tested in accordance with MIL-PRF-22885 and RTCA/DO-160.

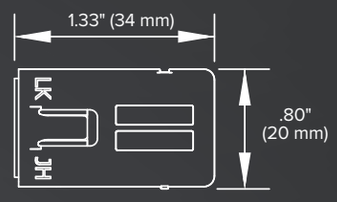
NEXSYS Modules can be used as stand-alone devices for solving system-to-system interface challenges. Advanced avionics solutions are possible when NEXSYS Modules are combined with the LYNK ISP or man-machine interface devices such as VIVISUN switches and indicators. There are no limits to the number of switches, indicators or NEXSYS Modules that can be used in an application.

Each NEXSYS Module can accommodate up to four NEXSYS components.

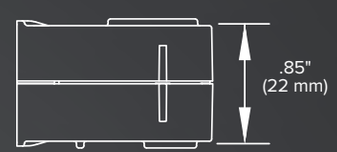
Form Factor



- ***Ruggedized, Small Form-Factor Enclosure for NEXSYS Components***
- ***Includes an In-line Harness Boot or can be bracket or Type 1 rail mounted***
- ***NEXSYS Modules meet the requirements of RTCA/DO-160***



Top View



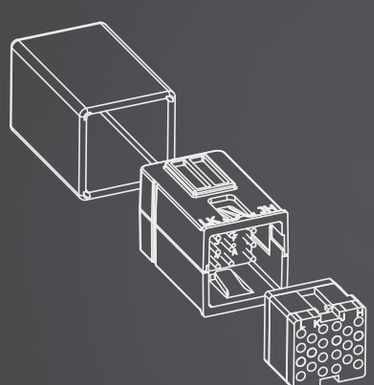
Side View

Mounting Options

A NEXSYS Module can be mounted in the boot provided and secured to the harness using industry standard methods for in-line harness wiring. Additionally, NEXSYS Modules can be mounted in a bracket or in a Type 1 rail.

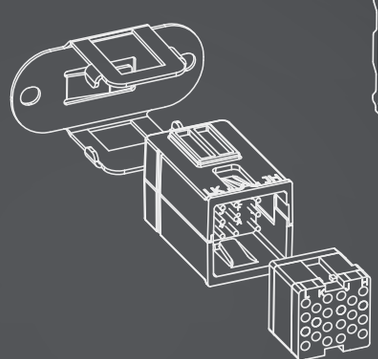
In-line Harness Boot

Included with NEXSYS Module.



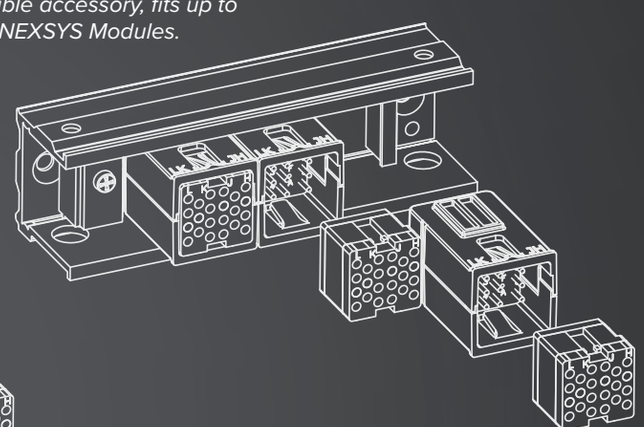
Bracket Mount

Right-angle bracket shown,
Flush mount bracket also available.



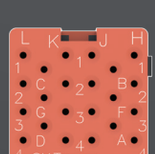
Type 1 Rail

Available accessory, fits up to three NEXSYS Modules.



Termination

NEXSYS Modules require the use of a keyed Connector Plug (*P/N* 18-440). The Connector Plug can be inserted into the module before or after insertion into any of the mounting variations. The Connector Plug can be removed from the Module using an Extraction Tool (*P/N* 18-234) without removing the Module from the mounting.



18-440
NEXSYS
Connector Plug
(For NEXSYS Module)

Performance Summary

Weight (incl. Connector Plug)	Module: 14 gms, Module and Boot: 22 gms, Module and Bracket: 22 gms
Materials	Thermoplastic (Module), Stainless Steel (Bracket), UL V-0 Rated Vinyl (Boot)
Temperature	Operating/Non-operating: -55 C to +85 C
Altitude	-15,000 to +55,000 feet
Salt and Humidity	Humidity: 240 hours, Salt: 96 hours
Shock	20 G Saw tooth, 75 G Half-sine
Vibration	10-2000 Hz 15 G

Qualifications Summary

The environmental and electrical qualification levels for the NEXSYS XCVR Module are summarized in the following table.

Test Description	Specification	Section	Category	Reference Levels
Altitude	RTCA/DO-160 MIL-STD-202 MIL-STD-810	4 105C 500	A2, F2 B Procedure II	-15,000, +55,000 Feet
Temperature	RTCA/DO-160 MIL-STD-810	4 501/502	F2 Procedure III	-55°C and +85°C
Temperature Variation	RTCA/DO-160 MIL-STD-202 MIL-STD-810	5 107 503	S2 A 1	5 Cycles -55°C / +85°C
High Temperature Survival (Non-Operating)	MIL-STD-202	108A	A	+85°C, 96 Hours (Switch)+125°C, 96 Hours (NEXSYS Modules)
Humidity	RTCA/DO-160 MIL-STD-202	6 106	B N/A	240 Hours, +38°C / 65°C, > 90% RH 240 Hours, -10°C / 65°C, > 90% RH
Operational Shock and Crash Safety	RTCA/DO-160 MIL-STD-202 MIL-STD-810	7 213 516	B B N/A	20 G Sawtooth 20G Acceleration, 75 G Half-Sine N/A
Acceleration	RTCA/DO-160 MIL-STD-202 MIL-STD-810	7 212 513	B A Procedure III	20 G, 3 Axis
Vibration	RTCA/DO-160 MIL-STD-202	8 204	R, U B	10 to 2000 Hz, Sine on Random 10 to 2000 Hz 15 G
Explosive Atmosphere	RTCA/DO-160 MIL-STD-202	9 109C	E B	N/A
Waterproofness	RTCA/DO-160 MIL-PRF-22885	10 4.7.20	R Splash-proof	450 Litres / Hour 15 Gallons / Minute -10°C /+ 40°C 85% RH
Sand and Dust	RTCA/DO-160 MIL-STD-202	12 110	D N/A	Silica Media
Fungus Resistance	RTCA/DO-160 MIL-PRF-22885	13 3.5.2	F N/A	Compliance by Material Selection
Salt Fog	RTCA/DO-160 MIL-STD-202	14 101	T A	96 Hour Tests
Power Input Aircraft Power	RTCA/DO-160	16.6	A	200ms / 50ms dropout
		16.6.1.3 (Momentary Power Interrupt)	N/A	No digital circuitry.
			B	50ms dropout
		16.6.1.5, 16.6.2.2	B	Tests not applicable to Category A
		16.6.2.3	A	12V +/- 0.24V for 7 sec.
		16.6.2.4	B	60V -0/+2V for 100ms
	MIL-HDBK-704-8	LDC (102, 301, 401, 501, 602)	N/A	N/A
Spike / Transient	RTCA/DO-160	17	A	Power 600V, 10µsec, 50 ohms
Audio Frequency Conducted Susceptibility	RTCA/DO-160 MIL-STD-461	18 CS101	Z Curve 1	Power Input, 4V P to P, 10Hz to 150KHz
Induced Signal Susceptibility	RTCA/DO-160	19	CW	10,000V/m, 120A/m, 350 and 800Hz
RF Conducted Susceptibility*	RTCA/DO-160 MIL-STD-461	20 CS114	Y Curve 5	300mA, 10KHz to 400MHz 109dBµA, 10KHz to 200MHz
	RTCA/DO-160 MIL-STD-461	20 CS114	W Curve 5	100mA, 10KHz to 400Hz 10KHz to 200MHz
RF Radiated Susceptibility*	RTCA/DO-160 MIL-STD-461	20 RS103	Y 200V/m	200V/m 2MHz to 18GHz
Conducted RF Emissions	RTCA/DO-160 MIL-STD-461	21 CE102	P N/A	150KHz to 152MHz 10KHz to 10MHz
Radiated RF Emissions	RTCA/DO-160 MIL-STD-461	21 RE102	P N/A	100MHz to 6GHz 10KHz to 6GHz
Lightning Induced Transient*	RTCA/DO-160 MIL-STD-461	22 CS117	XXK3L3 L1	Waveform 3, 600V, 1MHz, 10MHz, Single, Multiple, Burst Waveform 4, 300V, 69µsec Waveform 5A, 300V, 120µsec
Military Transient*	MIL-STD-461 MIL-STD-461	CS115 CS116	N/A N/A	5A 30nS 30/Sec for 1 minute Damped Sinusoidal, 10KHz to 100MHz
Dielectric Withstanding	MIL-STD-202	301		1000 VAC
Electrostatic Discharge	RTCA/DO-160 MIL-STD-461	25 CS118	A Level 4	15,000V, 150pF, 330 ohms
Magnetic Effect	RTCA/DO-160	15	Z	1° Deflection, at < 0.3m

Note: Stated EMC performance based on tests performed on an individually monitored component using unshielded cables as defined by the applicable EMC test document. The EMC performance of an installed system using NEXSYS components can be dependent on the actual installation environment and interconnection method.