1-RU | 2-RU PLC Hybrid

For Power Line Carrier Communications

AMETEK

POWER INSTRUMENTS

The 1-RU PLC Hybrid allows multiple Power Line Carrier (PLC) transmitters/receivers to be combined onto the same coax while simultaneously giving isolation between them to prevent interference and distortion in the signals. Unlike filters, hybrids provide isolation for two different input frequencies, no matter how close in frequency they are to one another. To combine more than two PLC units, hybrids can be stacked in a chain to have more combining inputs. They are bidirectional devices and can be used as a signal splitter (balance transformer) in the opposite direction for phase-to-phase coupling applications. Hybrids are relatively simple devices composed of completely passive devices (transformers, resistors, capacitors and inductors).
We design our hybrids to have a lot of margin in the power handling specifications to ensure high reliability. The 1-RU is a one rack unit chassis that holds up to four hybrids. The hybrid chassis extends back the same distance as the Universal Power Line Carrier chassis. This design makes the accessibility to wiring connections easier. The test points are in the front of the chassis giving convenient front test access for the hybrid and any attached carrier sets. Our hybrids also include connectors in the rear for easy access. The 1-RU Hybrid includes an in-line pushbutton switch which allows insertion of an in-line meter on test points without disrupting the carrier signal. Hybrids can easily be added or removed by sliding in/out on the rear of the chassis. We have multiple options available that include a balance transformer and a balanced combiner. The balance transformer is for splitting the signal for phase-to-phase coupling. The balanced combiner is for redundancy in splitting the signal for phase-to-phase coupling.

Our improved 1-RU mounting hybrids replaced most of the obsolete 2-RU mounting hybrid's models, as shown in the table below.

Obsolete 2-RU Hybrid	Equivalent Replacement 1-RU Hybrid
H1RB Resistive Hybrid	Balanced Hybrid
H1RB-40 Resistive Hybrid	Balanced Hybrid
H3XB Reactive Hybrid (Not obsolete)	No equivalent
H1SB Skewed Hybrid	Skewed Hybrid
H1SB-R Skewed Hybrid	Skewed Hybrid

FEATURES AND BENEFITS

1. User-friendly
2. Rack space savings
3. Ability to test without interruption
4. Modular
5. Multiple options available

AMETEK Hybrid Types

•Two types of **1-RU** height hybrids (new style): **Balanced and Skewed**

•Three types of **2-RU** height hybrids (old style): **H1RB, H3XB & H1SB-R**

Hybrids: 2-RU Old Style versus 1-RU New Style[1]Obsolete

RF Coax Connections (all female connectors unless noted)[2]Optional accessory available for converting to a UHF if desired

[3]Frequency range limited for Isolation Spec for H3XB type only
[4]With exact impedance matching

Physical mounting requirements:
•2-RU Hybrids: Up to 3 hybrids can be mounted on a 19" wide 2 RU blank plate and all connections and test points face to the rear. The hybrids extend back behind the mounting plate only about 5".
•1-RU Hybrids: Up to 4 hybrids can be mounted in a 19" wide 1 RU chassis with all connections in the rear but with all test points on the front of the chassis. The chassis extends back the same depth as a UPLC/UPLC-II chassis and slightly more than a TC-10B/TCF-10B chassis. This facilitates easy testing and wiring connections. All hybrids slide into rear slots in the chassis. The hybrid chassis can be ordered with projection mounting as an option.

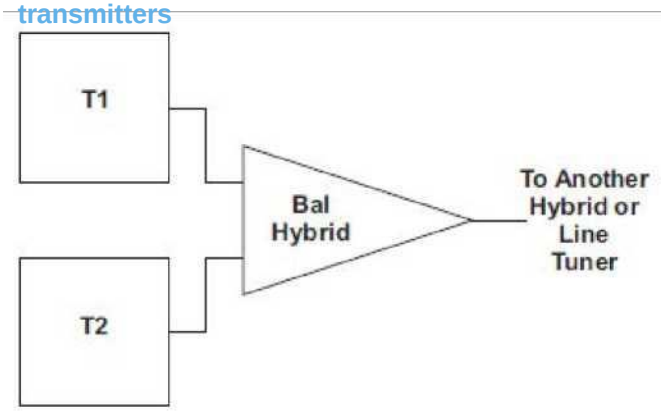
2-RU Hybrid (old style)	Replacement 1-RU Hybrid (new style)
H1RB Resistive Hybrid[1] 6266D72G05 or G07	Balanced Hybrid CH20-BALMN-001
H3XB Reactive Hybrid 6266D71G03	No replacement use old style
H1SB-R Skewed Hybrid[1] 1609C45G01-3	Skewed Hybrid CH20-SKWMN-001

Port	2-RU Types (Old Style)			1-RU Types (New Style)	
	H1RB	H3XB	H1SB-R	Balanced	Skewed
Input 1	BNC	BNC	BNC	BNC	BNC
Input 2	BNC	BNC	BNC	BNC	BNC
Output	BNC (male)	UHF	UHF	BNC[2]	BNC[2]

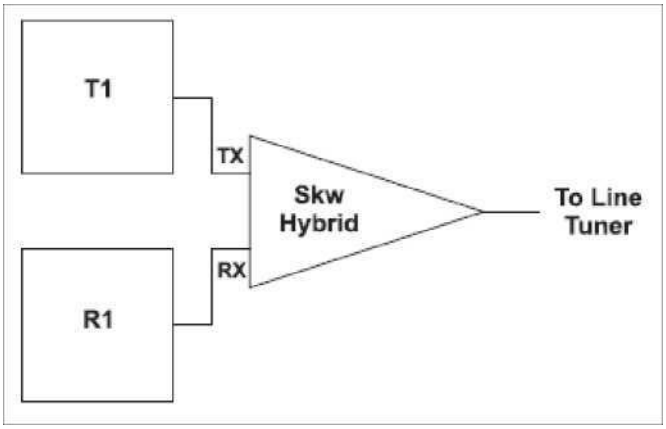
Specs	2-RU Types (Old Style)			1-RU Types (New Style)	
Type	**H1RB**	**H3XB**	**H1SB-R**	**Balanced**	**Skewed**
Frequency Range	30-535 kHz	30-535 kHz[3]	30-535 kHz	30-535 kHz	30-535 kHz
Max Power for TXs	15 watts	15 watts	100 watts	25 watts	100 watts
Output Impedance	50 Ω	44-75 Ω	50 or 75 Ω	50 or 75 Ω	50 Ω
Insertion Loss - Max	3.5 dB	3.5dB	TX: 1 dB RX: 13 dB	3.5dB	TX: 0.5 dB RX: 14.5 dB
Isolation Loss[4]	30 dB min	45 dB min[3]	40 dB min	30 dB min	40 dB min

SPECIFICATIONS

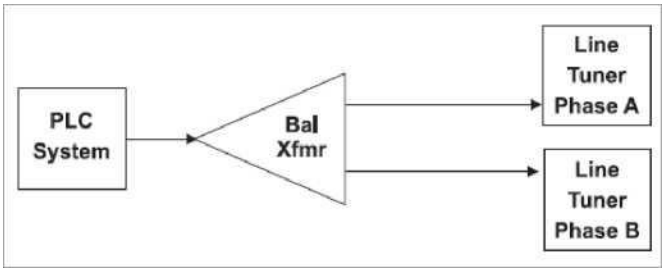
1. Balanced Hybrid for combining two transmitters



2. Skewed Hybrid for combining a TX/RX in a single FSK bidirectional channel



3. Balance Transformer for phase-to-phase coupling



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Hybrid Type	Balanced	Skewed
Part Number	CH20 - BALMN - 001	CH20 - SKWMN - 001
Frequency Range	30 - 535 kHz	30 - 535 kHz
Max Power for Transmitters	25 watts	100 watts
Output Impedance	50 or 75 ohms	50 ohms
Insertion Loss -Max	3.5 dB	TX: 0.5 dB RX: 14.5 dB
Isolation/ Trans-hybrid Loss[1]	30 dB min	40 dB min

[1]With exact impedance matching