

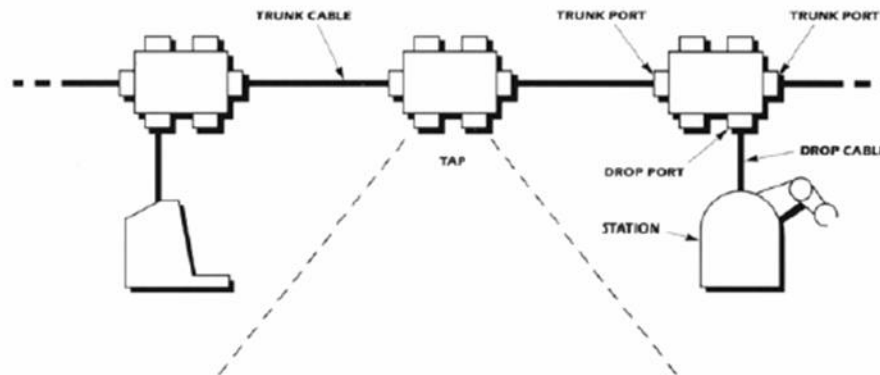
Product Specification

Carrier-band
IEEE 802.4

CB Taps

Carrier-band Networks are high reliability local area networks. They are used primarily in industrial communications systems for factory automation, process control and other applications where reliability is a major factor.

Carrier-band Taps are used for attaching stations to a Carrier-band network's trunk cable. (see below) Relcom makes a variety of taps with a number of options to meet industrial requirements. All Relcom Taps are an industrial grade, Hi-Reliability part that is epoxy encapsulated in plastic cases.



HI-REL TAPS

Product specifications are subject to change without notice.

Hi-rel

Hi-rel taps are made specifically for the carrier-band network. They are smaller, more rugged and cost less than the conventional aluminum body taps. Hi-rel taps are housed in a rugged, non-corroding package. Inside the tap's ABS plastic shell, the components are copper shielded and encapsulated in epoxy. There are no mechanical connections inside the taps and the epoxy encapsulation prevents component vibration and corrosion. The tap's small size allows placement in cabinets and other restricted space areas.

Hi-rel taps come in 2, 4 and 8 drop port versions. Lips on each port connector hold shrink tubing to the tap and the attached connector so that the connectors can be totally sealed. Hi-rel taps have gold connector, surge protection and ground current isolation options. The taps have a stainless steel grounding stud and a hole through the body for easy mounting. The plastic case has a UL 94 VO fire rating.

Options

A number of options are available to meet demanding requirements of industrial applications

- Isolation
One of the trunk ports is electrically isolated from the other ports to prevent low frequency ground currents from flowing in the trunk cable. Each trunk cable segment has its own ground. Isolation is recommended for areas where an explicit grounding system is not available.

- Surge protection

Gas discharge surge protectors inside the tap on each of the tap ports absorb very high currents induced into the cable system by near-lightning strikes. This protects the tap and the attached stations from damage. Surge protection is recommended for networks that span multiple buildings or are exposed to near-lightning strikes.

- Gold connector contacts

Gold plated F-connector center contacts are available on trunk and drop port connectors. Gold plating is recommended for environments where additional corrosion resistance is needed. The gold plating thickness is 0.7 micrometers or 30 micro-inches over nickel plate on beryllium copper spring material.

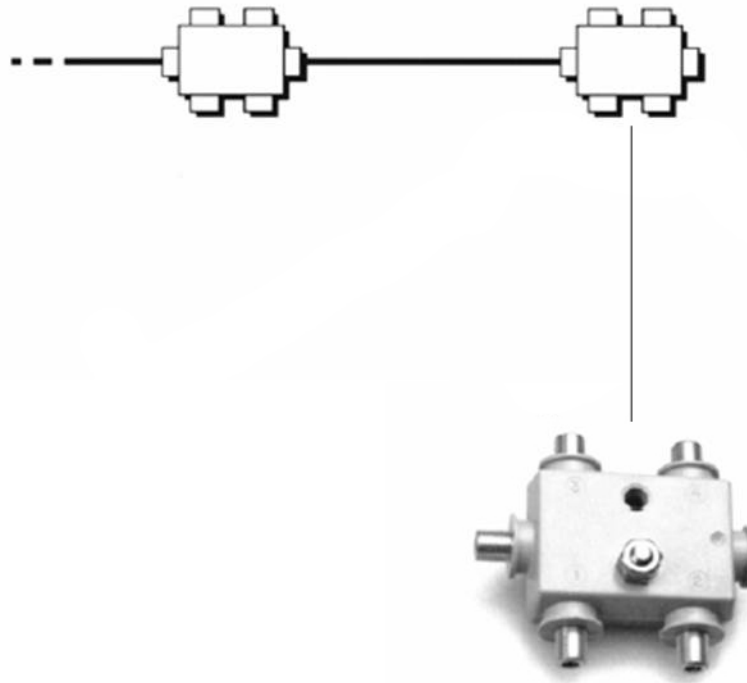
Electrical Characteristics

Relcom's carrier-band network taps meet the electrical characteristics specified in the IEEE 802.4, ISO 8802-4 and MAP standards. Taps can be used for both the 5 Mbit/s and 10 Mbit/s networks.

Taps have:

- 75 Ohm impedance on all ports.
Trunk ports present virtually no discontinuity to the trunk cable so that there is very little signal reflection from the taps (return loss).
- Non-directional coupling.
Signals from stations are sent in both directions on the trunk cable.
- .20 dB trunk-to-drop attenuation
- .20 dB drop-to-drop attenuation
An open or shorted drop cable will not affect the operation of other stations connected to the tap's drop ports.

TERMINATING TAPS



Terminating taps are 4-port taps that incorporate trunk cable end precision termination inside the body of the tap. Terminating taps are used at each end of a trunk cable.

An added benefit of a terminating tap is that it provides 3 dB more signal at each drop port. The extra signal allows 8 additional stations to be attached to the network and the network trunk cable can be up to 400 meters longer than if a conventional tap and terminator were used.

Terminating taps are available in Hi-Rel plastic cases. Gold F-connector contacts and surge protection options are available with both types of housings.

Electrically terminating taps have the same characteristics as other taps except that the trunk-to-drop attenuation is 16.5 ± 0.5 dB. Insertion loss of terminating taps does not need to be considered in network design calculations since all signal energy is absorbed in the tap.

Specifications

	5 Mbit/s (1)	10 Mbit/s (2)	Units	Test Conditions
Trunk Return Loss	35	32	dB min.	Fig. 1, 2 Vrms
Drop Return Loss	20	20	dB min.	Fig. 1, 2 Vrms
Trunk-to-Drop Attn.*	20	20	dB nom.	Fig. 2, 2 Vrms
Drop-to-Drop Attn.	20	20	dB min.	Fig. 2, 2 Vrms

Insertion Loss

Hi-rel 2-port	0.3	0.35	dB max.	Fig. 2, 0.2 Vrms
Hi-rel 4-port	0.45	0.5	dB max.	Fig. 2, 0.2 Vrms
Hi-rel 8-port	0.9	1.0	dB max.	Fig. 2, 0.2 Vrms

Terminating Taps

Trunk-to-Drop Attn.*	16.5 +/- 0.5	16.5 +/- 0.5	dB	Fig. 2, 2 Vrms
----------------------	--------------	--------------	----	----------------

Specifications are valid in the -20 to +85° C temperature range.

Test Method

Electrical parameters are measured using the test configurations shown in Figures 1 and 2. These simulate network conditions and provide a realistic assessment of tap performance.

1. For 5 Mbit/s networks, test frequencies are 5 and 10 MHz.

- For 10 Mbit/s networks, test frequencies are 10 and 20 MHz.
- Signal generator square wave output; $t_r = t_f = 7.5$ ns
- All unused tap ports terminated in 75 ohms

Figure 1. Return Loss Measurement

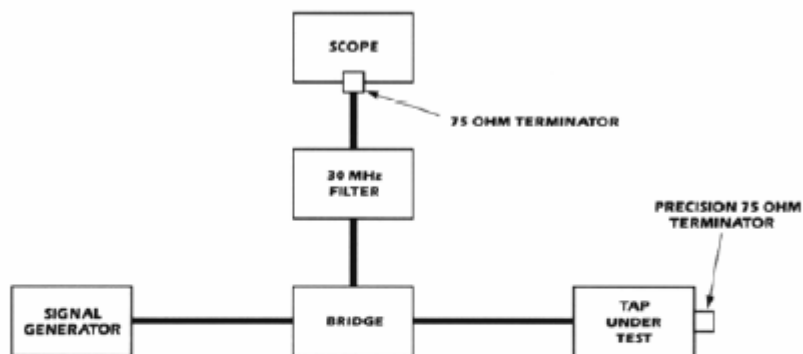
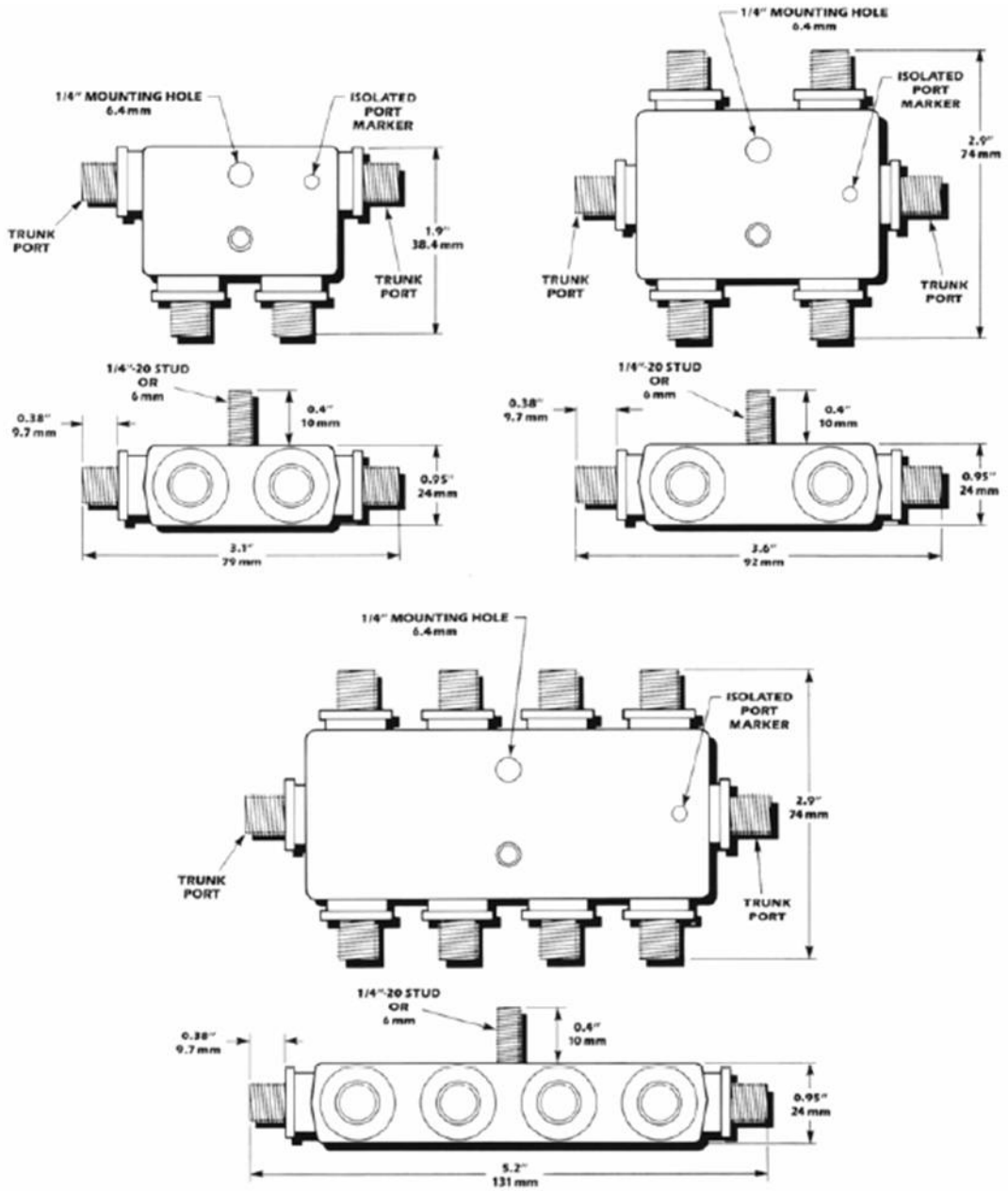


Figure 2. Attenuation Measurement



*Trunk-to-drop attenuation to a given drop port depends on which trunk connector the signal is injected. For 2 and 4-port taps, the tolerance to the nominal 20 dB is ± 0.5 dB; for 8-port taps, the tolerance is +0.5, -0.75.

HI-REL



TAP NUMBERING CONVENTION

CBT-XXX0XX

DROP PORTS:

- 2 – Two Ports
- 4 – Four Ports
- 8 – Eight Ports

CASE TYPE:

- 2 – Hi-Rel Epoxy Encapsulated Case W/ SAE Ground Stud
- 3 – Hi-Rel Epoxy Encapsulated Case W/ Metric Ground Stud

OPTIONS:

- 0 – Standard Tap
- 1 – Isolation on Trunk Port
- 2 – Surge Protection on All Ports
- 3 – Surge Protection on All Ports and Isolation on Trunk Port

TAP TYPE:

- 0 – Standard Tap
- T – Terminating Tap

CONNECTOR CENTER CONTACT PLATING:

- G – Gold
- T – Tin

Example:

CBT-23300G

- 2-Port
- Hi-Rel Case, Metric Ground Stud
- Isolation and Surge Protection
- Gold Connector Contacts

Warranty

Relcom, Inc. warrants the taps to perform as described in this data sheet under normal use for a period of **ONE YEAR** after delivery to the original purchaser. This warranty does not apply if the taps have been disassembled, modified or used for purposes other than those described in this data sheet.

Upon verification of any defect, Relcom, Inc. shall, at its option, repair or replace the defective unit.

Before utilizing the Taps, the user should determine their suitability for the intended use. The user assumes all risks and liability whatsoever in connection with such use. In no event does Relcom, Inc. assume liability for incidental or consequential damages.

This warranty is the extent of the obligation or liability assumed by Relcom, Inc., and no other warranty or guarantee is either expressed or implied.

Relcom, Inc. reserves the right to make design changes to the Taps without notice and with no obligation to make the same or similar changes to units previously manufactured.

All statements in this manual are based on information believed to be reliable. Relcom, Inc. is not, however, responsible for any errors or omissions. If you have any questions or suggestions, please contact us.