

## Lynx<sup>®</sup> Product Application Guide

The Lynx<sup>®</sup> Broadband Distribution System is a combination of hub units and terminal adapters that can be installed into a Category 5 or higher structured wiring plant. It supports all broadband signals in the 5 MHz to 860 MHz bandwidth, however, performance beyond 550 MHz is limited by the presently available connectors and cable. Refer to the performance specifications for each product for detailed bandwidth characteristics. The system is bi-directional fully capable of delivering digital or analog signals as may be required. This includes analog and digital television as well as many data transmission methods and applications. The system is designed to be used with standard wiring components including patch panels, patch cables and RJ45 plugs and jacks. All signals are carried on the brown/brown white pair of conductors (pair 4, pins 7 and 8, EIA/TIA 568B) in the cable. The other pairs are not used and are, therefore, available for other services such as voice grade telephone. Use of other pairs for 100baseT or faster data transmission is not recommended at this time.

Signals are converted from 75 $\Omega$  coaxial cable to 100 $\Omega$  UTP cable by the patented broadband Lynx<sup>®</sup> Balun (US patents 5,495,212 and 5,633,614 – other patents pending). The Lynx<sup>®</sup> Balun is used inside both the Lynx<sup>®</sup> Distribution Hub in the wiring closet, and the Lynx<sup>®</sup> Terminal Adapter at the equipment end. Bi-directional transmission is accomplished by inclusion of a filter network in the active hub electronics. Signals in the 5 to 40 MHz band emanating from the terminal ends are routed around the amplifier to the RF source connector. The passive devices are inherently bi-directional over the entire frequency spectrum.

A typical installation would consist of an RG-6 CATV service connection to a Lynx<sup>®</sup> Distribution Hub and Category 5e cables to each equipment termination. In larger installations an RG-6 backbone distributes the CATV signals to each wiring closet and Lynx<sup>®</sup> Distribution Hub within the closets. Standard broadband amplifiers, controllers and cable accessories are used on the backbone side of the wiring plant. If other services such as satellite dish receivers, off-air broadcast receiving antennas, or other signal sources are to be distributed, an appropriate channel re-modulation scheme should be included at the head-end. The output of the re-modulation equipment is then combined and distributed through the backbone wiring plant to the hub units using standard coaxial cable hardware.

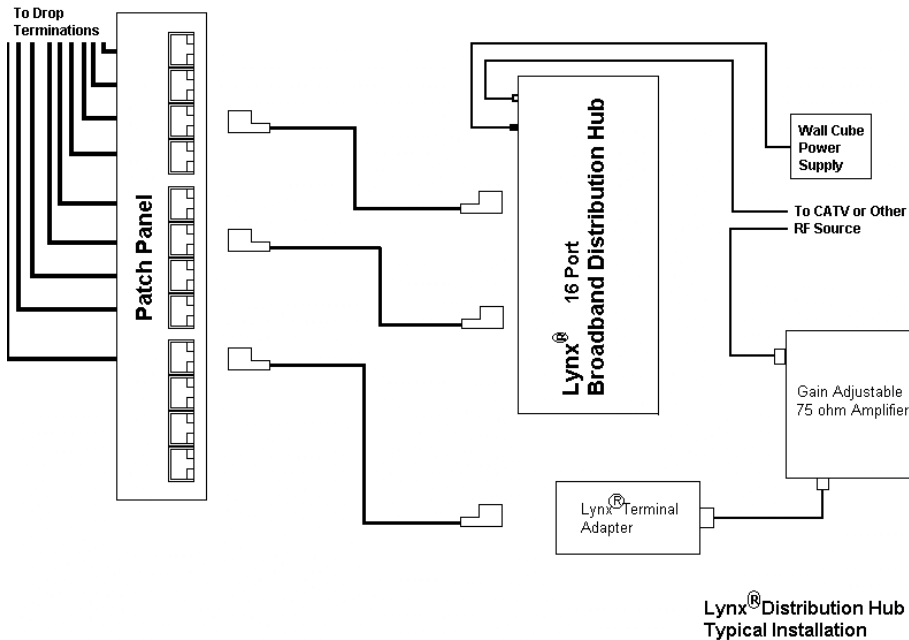
The maximum allowable input signal level delivered to the amplified distribution hub is +10dBmV. Signals higher than this will permanently damage the internal amplifier, requiring factory service. To determine the input levels needed in an application, use the cable distance charts in the product data sheet for the specific components being installed. Keep in mind that most televisions will deliver a satisfactory picture with an input signal of -10dBmV.

Variations between manufacturers of cable, connectors, and patch components, as well as variations in the installation itself will vary performance somewhat. When compared to Category 6 wiring, Category 5 installations will usually require shorter cable runs or usage of lower channels or frequencies. For optimum performance in any system, we recommend using or re-modulating to the lowest possible channel or frequency. Where this is not possible, and very long distance transmission is required, the use of separate amplifiers and two Lynx<sup>®</sup> Terminal Adapters is recommended as shown in the following typical installation diagram.

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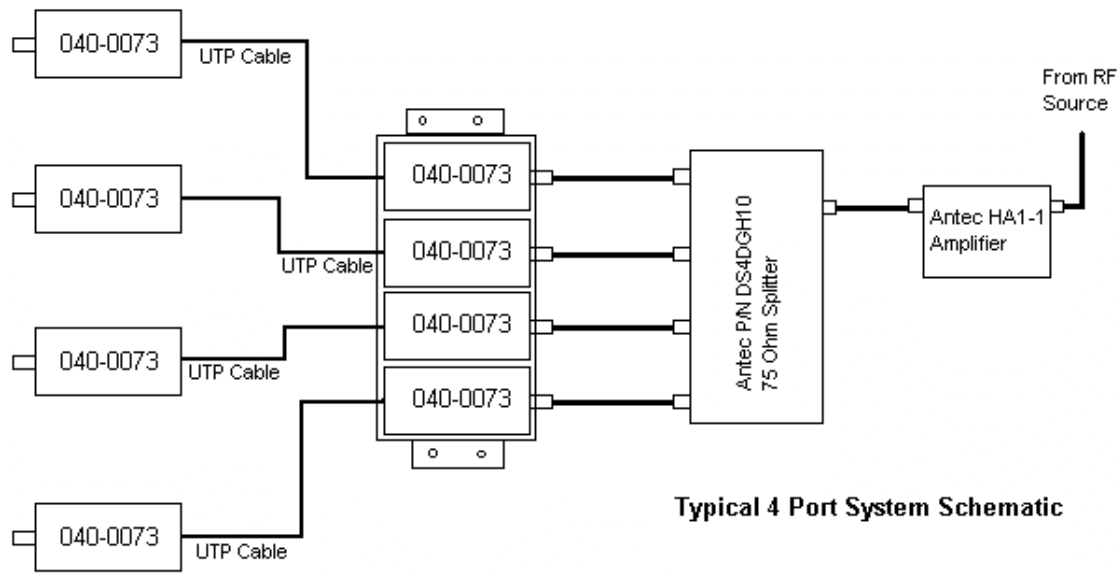
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When the *Lynx*<sup>®</sup> Terminal Adapter is used in the wiring closet to supplement the *Lynx*<sup>®</sup> Distribution Hub, the system can be optimized for the largest number of terminals. The adapter can be employed together with a high power broadband amplifier to drive the longest cable drops or to accommodate frequencies up to 860 MHz. Please note that the *Lynx*<sup>®</sup> adapter and the 8 port passive hub are certified for use up to 860 MHz, but due to losses induced by the currently available cabling components, only short distances are possible. Depending on the application, input signal levels up to +30dBmV are permitted. In an industrial / commercial installation, this allows a cable length of up to 660 meters for channel T7 or 75 meters for channel 78. When several terminal adapters are to be used in one location, the *Lynx*<sup>®</sup> Adapter Mounting Plate can be utilized to create a neat and secure installation.

## Typical Small System Installation

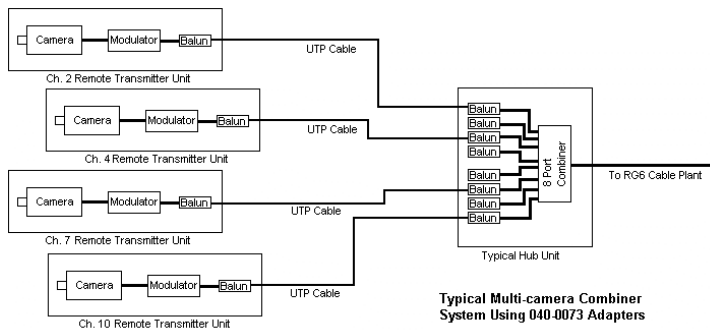
In small systems where the 16 port hub is considered too large, *Lynx*<sup>®</sup> Terminal Adapters can be ganged in the wiring closet and combined with standard coaxial components. Up to 4 adapters can be ganged onto a *Lynx*<sup>®</sup> Adapter Mounting Plate and combined with standard coaxial amplifiers and splitters. This creates a quick and inexpensive solution for smaller applications. We recommend using Antec DS4DGH10 splitters and HA4-1 amplifiers, although other high quality brands will work as well. Since the adapters are passive devices, a bi-directional system can be configured. In this example the CATV signal is connected first to an amplifier and then through a splitter and adapters to the structured wiring plant. The *Lynx*<sup>®</sup> Terminal Adapters are mounted in a *Lynx*<sup>®</sup> Adapter Mounting Plate, creating the equivalent of a 4 port hub unit. In very short cable drops where the signal reaching the receiver is over +15dBmV, a standard coaxial attenuator may be needed between the *Lynx*<sup>®</sup> Terminal Adapter and the terminal to prevent receiver overload.



**Typical 4 Port System Schematic**

### Typical Remote Signal Combiner Application

Another typical application using the *Lynx*<sup>®</sup> *Terminal Adapter* is the combination of signals from several sources, such as educational broadcasts from cameras in classrooms. In this configuration the output from the camera and microphone is modulated onto an appropriate VHF channel and sent to the head-end for combining and re-distribution throughout the school or office building. By modulating each source's audio and video to a different frequency, several individual broadcasts can be distributed simultaneously. The viewer is only required to tune in to the appropriate channel to view the desired program. A variation of this configuration can be used to create a very low cost videoconferencing system. In this following diagram each classroom output is modulated onto a different channel and delivered through the twisted pair cable to the



**Typical Multi-camera Combiner System Using 040-0073 Adapters**

wiring closet. In the closet the signals are combined through adapters and a coaxial splitter/combiner. The combined signal is distributed throughout the building on the coaxial cable plant. Some of the receivers may be connected to the coaxial plant with *Lynx* products, but this is not shown in the diagram.

**Reference Table**  
**CATV Frequencies & Channel Assignments**

Channel Number	EIA Channel Number	Frequency (MHz)	Channel Number	EIA Channel Number	Frequency (MHz)	Channel Number	EIA Channel Number	Frequency (MHz)
T7	none	7 --12	W	36	294 -- 300	-	84	582 -- 588
T8	none	13 -- 18	AA	37	300 -- 306	-	85	588 -- 594
T9	none	19 -- 224	BB	38	306 -- 312	-	86	594 -- 600
T10	none	25 -- 30	CC	39	312 -- 318	-	87	600 -- 606
T11	none	31 --36	DD	40	318 -- 324	-	88	606 -- 612
T12	none	37 -- 42	EE	41	324 -- 330	-	89	612 -- 618
T13	none	43 -- 48	FF	42	330 -- 336	-	90	618 -- 624
T14	none	49 -- 54	GG	43	336 -- 342	-	91	624 -- 630
2	2	55 -- 60	HH	44	342 -- 348	-	92	630 -- 636
3	3	61 -- 66	II	45	348 -- 354	-	93	636 -- 642
4	4	67 -- 72	JJ	46	354 -- 360	-	94	642 -- 648
A8	1	72 -- 78	KK	47	360 -- 366	-	100	648 -- 654
5	5	77 -- 84	LL	48	366 -- 372	-	101	654 -- 660
6	6	83 -- 90	MM	49	372 -- 378	-	102	660 -- 666
A5	95	90 -- 96	NN	50	378 -- 384	-	103	666 -- 672
A4	96	96 -- 102	OO	51	384 -- 390	-	104	672 -- 678
A3	97	102 -- 108	PP	52	390 -- 396	-	105	678 -- 684
A2	98	108 -- 114	QQ	53	396 -- 402	-	106	684 -- 690
A1	99	114 -- 120	RR	54	402 -- 408	-	107	690 -- 696
A	14	120 -- 126	SS	55	408 -- 414	-	108	696 -- 702
B	15	126 -- 132	TT	56	414 -- 420	-	109	702- 708
C	16	132 -- 138	UU	57	420 -- 426	-	110	708 -- 714
D	17	138 -- 144	VV	58	426 -- 432	-	111	714 -- 720
E	18	144 -- 150	WW	59	432 -- 438	-	112	720 -- 726
F	19	150 -- 156	XX	60	438 -- 444	-	113	726 -- 732
G	20	156 -- 162	YY	61	444 -- 450	-	114	732 -- 738
H	21	162 -- 168	ZZ	62	450 -- 456	-	115	738 -- 744
I	22	168 -- 174	AAA	63	456 --462	-	116	744 -- 750
7	7	174--180	BBB	64	462 -- 468	-	117	750 -- 756
8	8	180--186	CCC	65	468 -- 474	-	118	756 -- 762
9	9	186--192	DDD	66	474 -- 480	-	119	762 -- 768
10	10	192--198	EEE	67	480 -- 486	-	120	768 -- 774
11	11	198--204	FFF	68	486 -- 492	-	121	774 -- 780
12	12	204--210	GGG	69	492 -- 498	-	122	780 -- 786
13	13	210--216	HHH	70	498 -- 504	-	123	786 -- 792
J	23	216 -- 222	III	71	504 -- 510	-	124	792 -- 798
K	24	222 -- 228	JJJ	72	510 -- 516	-	125	798 -- 804
L	25	228 -- 234	KKK	73	516 -- 522	-	126	804 -- 810
M	26	234 -- 240	LLL	74	522 -- 528	-	127	810 -- 816
N	27	240 -- 246	MMM	75	528 -- 534	-	128	816 -- 822
O	28	246 -- 252	NNN	76	534 -- 540	-	129	822 -- 828
P	29	250 -- 258	OOO	77	540 -- 546	-	130	828 -- 834
Q	30	258 -- 264	PPP	78	546 -- 552	-	131	834 -- 840
R	31	264 -- 270	-	79	552 -- 558	-	132	840 -- 846
S	32	270 -- 276	-	80	558 -- 564	-	133	846 -- 852
T	33	276 -- 282	-	81	564 -- 570	-	134	852 -- 858
U	34	280 -- 288	-	82	570 -- 576	-		
V	35	288 -- 294	-	83	576 -- 582	-		

**Reference Table**  
**Broadcast Television Frequencies & Channel Assignments**

(boldface type indicates digital channels)

<b>Channel Number</b>	<b>Frequency (MHz)</b>	<b>Channel Number</b>	<b>Frequency (MHz)</b>	<b>Channel Number</b>	<b>Frequency (MHz)</b>
2	54---60	<b>25</b>	536---542	<b>48</b>	674---680
3	60---66	<b>26</b>	542---548	<b>49</b>	680---686
4	66---72	<b>27</b>	548---554	<b>50</b>	686---692
5	76---82	<b>28</b>	554---560	<b>51</b>	692---698
6	82---88	<b>29</b>	560---566	52	698---704
7	174---180	<b>30</b>	566---572	53	704---710
8	180---186	<b>31</b>	572---578	54	710---716
9	186---192	<b>32</b>	578---584	55	716---722
10	192---198	<b>33</b>	584---590	56	722---728
11	198---204	<b>34</b>	590---596	57	728---734
12	204---210	<b>35</b>	596---602	58	734---740
13	210---216	<b>36</b>	602---608	59	740---746
14	470---476	<b>37</b>	not used	60	746---752
15	476---482	<b>38</b>	614---620	61	752---758
16	482---488	<b>39</b>	620---626	62	758---764
17	488---494	<b>40</b>	626---632	63	764---770
18	494---500	<b>41</b>	632---638	64	770---776
19	500---506	<b>42</b>	638---644	65	776---782
20	506---512	<b>43</b>	644---650	66	782---788
21	512---518	<b>44</b>	650---656	67	788---794
22	518---524	<b>45</b>	656---552	68	794---800
23	524---530	<b>46</b>	662---668	69	800---806
24	530---536	<b>47</b>	668---674		

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