

Amplifier & Equalizer is used in quad cable based control communication system in electrified as well as in non-electrified section. Wherever quad cables are laid with OFC, control communication is provided on OFC. Block circuits, emergency sockets and level crossings gate communication are provided on quad cable and where only quad cable is laid, control as well as block communication are being provided on the quad cable.

The colour scheme of PET quads is given below:

Quad No.	Colour of the conductor insulation			
	A-Wire	B-Wire	C-Wire	D-Wire
1	White	Orange	Red	Grey
2	White	Blue	Red	Grey
3	White	Brown	Red	Grey
4	White	Green	Red	Grey
5	White	Yellow	Red	Grey
6	White	Black	Red	Grey

The Colour scheme of the quad whipping is given below: e quad whipping is given below:

Quad No.	Colour Scheme	Quad No.	Colour Scheme
1	Orange	4	Green
2	Blue	5	Yellow
3	Brown	6	Black

VF communication system consists of Cable termination, distribution & monitoring panel, U link panel, Equalizer Amplifier and V F transformer panel, Decoder & other PCBs, 8 way Intercom, Remote monitor/sensor Power supply unit.

Equalizer Amplifier and V F transformer panel

It consists of one equalizer amplifier card suitable for 4-Wire 4-Way system and second card for isolation transformers consisting of 8 numbers of VF transformers. These two cards will cater to one control circuit

Features of Equalizer Amplifier

The control circuit works on un-loaded PET quad cable of 0.9mm diameter. Amplifier Equalizer equipment is provided at every station to equalize the losses.

Balancing of various quads is carried out at every station.

Radio patching can be done without reversing the direction of amplifiers.

The circuit get isolated from the system, if any card of that circuit is taken out.

In case of power supply failure at a station, the station can be by passed.

Electrical Parameters

- Input impedance of VF Amplifier is 470 Ohm 10%.
- The nominal gain of the amplifier is 20 dB 1 dB for frequency of 1 KHz.
- The frequency response of the amplifier is flat within 3 dB for 300 Hz to 3.4 KHz.
- The amplifier can not be overloaded for an output of +4 dBm with equalizers.
- Cross talk level shall be better than 60 dB

Power Supply Requirement

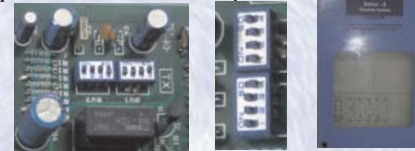
Amplifier Equalizer equipment is normally operates on 160 V to 270 V AC with facility of solar power operation, suitable over voltage protection and short-circuit protection. For power back up of at least 72 hours, a set of two low maintenance batteries of 12V, 40AH each is provided.

Precautions

- Do not touch any components on the PCB
- Use a low voltage soldering iron with grounded tip.
- Do not repair / install the equipment when the power supply is in ON condition.

Equipment	Item	Maintainer	SE	SSE
Repeater/ Amplifier- Equalizer Equipment	Checking Power Supply voltage at the input point.	Weekly	Monthly (Every Installation)	Quarterly (Every installation)
	Checking of various cards in proper position.	Do	Do	Do
	Checking the functioning of all the circuits.	Do	Do	Do
Batteries	Section wise and end to end line up of all circuits.	Do	Do	Do
	Cleaning & tightening of all connections	Weekly	Monthly (Every Installation)	Quarterly (Every installation)
	Measurement of voltages and gravity	Do	Do	Do

Gain Adjustment Chart for Receive by DIP switches to equalize losses in Indisco make equalizer



Gain in dB	SW 3/1	SW 3/2	SW 4/1	SW 4/2	SW 4/3	SW 4/4
1	OFF	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	ON
3	OFF	ON	OFF	OFF	ON	ON
4	OFF	ON	OFF	ON	ON	ON
5	OFF	ON	ON	ON	ON	ON
6	ON	ON	OFF	OFF	OFF	OFF
7	ON	ON	OFF	OFF	OFF	ON
8	ON	ON	OFF	OFF	ON	ON
9	ON	ON	OFF	ON	ON	ON
10	ON	ON	ON	ON	ON	ON
11	OFF	OFF	OFF	OFF	OFF	OFF
12	OFF	OFF	OFF	OFF	OFF	ON
13	OFF	OFF	OFF	OFF	ON	ON
14	OFF	OFF	OFF	ON	ON	ON
15	OFF	OFF	ON	ON	ON	ON
16	ON	OFF	OFF	OFF	OFF	OFF
17	ON	OFF	ON	OFF	OFF	OFF
18	ON	OFF	ON	ON	OFF	OFF
19	ON	OFF	ON	ON	ON	OFF
20	ON	OFF	ON	ON	ON	ON

Gain Adjustment Chart for Trans by DIP switches to equalize the cable in Indisco make equalizer

Gain in dB	SW 7/1	SW 7/2	SW 8/1	SW 8/2	SW 8/3	SW 8/4
1	OFF	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	ON
3	OFF	ON	OFF	OFF	ON	ON
4	OFF	ON	OFF	ON	ON	ON
5	OFF	ON	ON	ON	ON	ON

Gain in dB	SW 7/1	SW 7/2	SW 8/1	SW 8/2	SW 8/3	SW 8/4
6	ON	ON	OFF	OFF	OFF	OFF
7	ON	ON	OFF	OFF	OFF	ON
8	ON	ON	OFF	OFF	ON	ON
9	ON	ON	OFF	ON	ON	ON
10	ON	ON	ON	ON	ON	ON
11	OFF	OFF	OFF	OFF	OFF	OFF
12	OFF	OFF	OFF	OFF	OFF	ON
13	OFF	OFF	OFF	OFF	ON	ON
14	OFF	OFF	OFF	ON	ON	ON
15	OFF	OFF	ON	ON	ON	ON
16	ON	OFF	OFF	OFF	OFF	OFF
17	ON	OFF	ON	OFF	OFF	OFF
18	ON	OFF	ON	ON	OFF	OFF
19	ON	OFF	ON	ON	ON	OFF
20	ON	OFF	ON	ON	ON	ON

DIP SWITCH SETTING OF TRANS / RECEIVE GAIN AMPLIFIER (Epsilon)



SW9 / SW10	1	2	3	4	5	6	OUTPUT
INPUT	1	2	3	4	5	6	OUTPUT
-2db	OFF	ON	ON	ON	ON	ON	0.0db
-5db	OFF	ON	ON	ON	ON	ON	-0.1db
-6db	OFF	ON	ON	ON	ON	ON	-0.2db
-7db	OFF	ON	ON	ON	ON	ON	-0.4db
-8db	OFF	ON	ON	ON	ON	ON	-0.6db
-9db	ON	OFF	ON	ON	ON	ON	+0.8db
-10db	ON	OFF	ON	ON	ON	ON	0.0db
-11db	ON	ON	OFF	ON	ON	ON	+0.5db
-12db	ON	ON	OFF	ON	ON	ON	-0.5db
-13db	ON	ON	ON	OFF	ON	ON	+0.5db
-14db	ON	ON	ON	OFF	ON	ON	-0.5db
-15db	ON	ON	ON	ON	ON	ON	+0.5db
-16db	ON	ON	ON	ON	ON	ON	-0.5db
-17db	ON	ON	ON	ON	OFF	ON	+0.5db
-18db	ON	ON	ON	ON	OFF	ON	-0.5db
-19db	ON	ON	ON	ON	ON	ON	+0.5db
-20db	ON	ON	ON	ON	ON	ON	-0.5db

EQUALIZER GAIN SETTING : 300 HZ(SW1 / SW5), 1 KHZ (SW2 / SW6) & 2 KHZ (SW3 / SW7)

1	2	3	4	5	6	7	8	9	10	Gain
ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	-5db
OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	-4db
OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	-3db
OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	-2db
OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	-1db
OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	0db
OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	1db
OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	2db
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	3db
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	4db

EQUALIZER GAIN SETTING : 3 KHZ

SW 4A / SW 8 A SW4 / SW8

1	2	3	4	1	2	3	4	5	6	Gain
ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	0db
OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	1db
OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	2db
OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	3db
OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	4db
OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	ON	5db

SW4/SW 8 SW 4A / SW 8A

1	2	3	4	1	2	3	4	5	6	Gain
OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	4db
OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	5db
OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	6db
OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	7db
OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	8db
OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	ON	9db

SW 4A / SW 8A SW4/SW8

1	2	3	4	1	2	3	4	5	6	Gain
OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	6db
OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	7db
OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	8db
OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	9db
OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	10db
OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	ON	11db

DISCLAIMER

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GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

Amplifier Equalizer System



CAMTECH/ST/PROJ/2012-13/AMPEQ1.0
November 2012



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