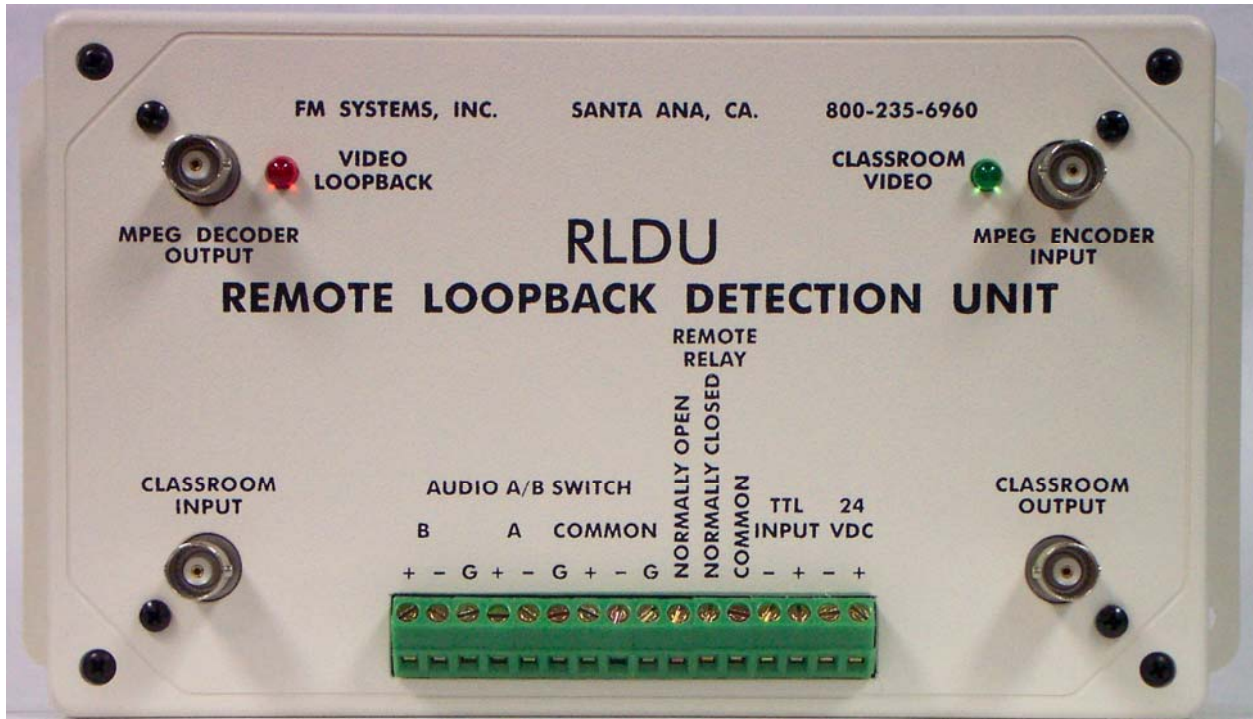


RLDU



REMOTE LOOPBACK DETECTION UNIT

INSTRUCTION BOOK

IB6296-03

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DESCRIPTION

The REMOTE LOOPBACK DETECTION UNIT or "RLDU" is an electronic device that encodes a discrete identifier onto an NTSC video signal. The discrete identifier becomes an integral part of the video signal and can be transported digitally over any medium that will pass the selected field and line of video used for the identifier. This discrete identifier is encoded onto any field of any one line of the video picture. It can be programmed on site to any line and field from line 10 in the vertical interval up to and including line 25 of the picture. Also the binary code can be reprogrammed on site without any additional equipment using the programming switches on the units PC board.

Each RLDU unit comes from the factory with a pre-set non-repeating discrete identification code. The factory keeps a record of all discrete codes and their ship to locations. These codes are marked on the serial number tag applied to each unit.

To prevent corruption of the discrete identification code by any video that might exist on the selected field or line, it is necessary to "strip" off the existing video on that field and line prior to insertion of the code. This "line strip" function and code insertion is Remote Controlled by the TTL input connected at the screw terminals on the RLDU. A TTL "LOW" on the Remote Control input initiates the line strip and code insertion. A TTL "HIGH" on the Remote Control input prevents line strip and code insertion. This passive equipment state allows upstream data to pass through the unit un-changed.

When the RLDU receives its own signal being looped back from another location an alarm state is detected. The alarm state operates the video A/B switch and an audio A/B switch capable of switching the balanced mono audio signal along with the video. A separate C form dry contact relay is provided for other remote control features. Both normally open and normally closed contacts are available using the screw terminal connections on the unit.

The video signals coming to and from the class room are connected to the BNC "female" video connectors on the unit. The video signals going to and from the MPEG/ATM network equipment are connected to the BNC "female" video connectors on the unit. The A/B video switch for by-passing the MPEG/ATM loopback latency problem is an integral part of the class room video input and output connectors. During an alarm state, the class room video input is connected to the class room video output effectively returning the class room video to the class room monitors without any latency or delay in the video signal.

The system has two LED indicators. The green LED indicates the classroom video is connected and on. The Red LED indicates the loopback code has been received and the A/B switches have been activated.

DESCRIPTION (cont).

The system is housed in a white ABS enclosure that has a UL flame rating of 94-V0 and is powered by a +24 VDC power transformer. The unit can be mounted on any surface using the four mounting holes at the base of the box.

MOUNTING INSTRUCTIONS

The rugged one piece mounting structure allows you to mount the unit firmly in place with four screws. Select a place to mount the unit away from harsh or wet environments, indoors is recommended. The RLDU should be located near your ATM/MPEG equipment or it can be placed near your class room signals. Select a position that gives you the best access to cable the system and reduces the labor in installation.

HOW TO CABLE THE RLDU

Connect the video cable coming from the Class room to the BNC female connector marked "CLASS ROOM OUTPUT" on the RLDU. Then connect the video cable going to the Class room to the BNC female connector marked "CLASS ROOM INPUT" on the RLDU.

Next connect the video cable coming from the ATM/MPEG output and connect it to the BNC female connector marked "MPEG DECODER OUTPUT". Then connect the video cable coming from the MPEG ENCODER input and connect it to the BNC connector marked "MPEG ENCODER INPUT".

The video A/B Loopback switch is built-in to the device. The audio A/B switch is simply connected using the screw terminals marked "AUDIO A/B SWITCH A , B and COMMON. The audio switch and connections are Balanced MONO . Observe audio polarity as marked by the "+" and "-" labeling. The "G" marks the ground shield connections used for isolation and audio shielding. The audio is switched using a form C dry contact relay.

An external TTL control feature is connected by using the two screw terminals marked "TTL INPUT". The "+" is the active lead and the "-" is the ground for the TTL input. The TTL "+" terminal is pulled high internally. To operate the TTL control simply ground the "+" terminal to produce a tag on the video.

The REMOTE RELAY function is used by connecting the equipment you wish to control to the screw terminals marked "REMOTE RELAY Normally Open, Normally Closed and Common". This relay is a form C type of dry contact relay.

POWER SUPPLY INSTALLATION

Attach the Wall Mount power supply to the screw terminals marked "24 VDC +/-" on the RLDU. An internal rectifier bridge will automatically route the power polarity correctly. At this time you will see the Green LED marked "VIDEO" turn on to indicate power up, it will be on or be flashing on and off, depending on the classroom video status.

SET-UP OF THE RLDU

The RLDU comes from the factory pre-programmed with a discrete identification code that is non-repeating. No set-up or programming is required for operation of the RLDU.

However, if operation on a different video line or field is required, it is recommended that you call the factory to secure a new discrete code for on-site programming. On-site programming is achieved by moving the programming switches located on the PC board. Open the box by removing the 4 screws in the outer most corners of the box. Lift up the lid and look for the selection switches. Select the channel and code you wish to operate on and arrange the switches to select that channel/code. The code is loaded and saved each time the power is turned on.

If the programming is changed, it can be returned to factory setting by looking at the serial number of the unit. The serial number of the unit is the original discrete programming code for the unit. See the programming code table in this manual for instructions on how to select the code.

OPERATION

The REMOTE LOOPBACK DETECTION UNIT or "RLDU" is an electronic device that encodes a discrete identifier onto an NTSC video signal. The discrete identifier becomes an integral part of the video signal and can be transported digitally over any medium that will pass the selected field and line of video used for the identifier. This discrete identifier is encoded onto any field of any one line of the video picture. It can be programmed on-site to any line and field from line 10 in the vertical interval up to and including line 25 of the picture. Also, the binary code can be reprogrammed on-site without any additional equipment using the programming switches on the unit's PC board.

Each RLDU unit comes from the factory with a pre-set non-repeating discrete identification code. The factory keeps a record of all discrete codes and their ship-to locations. These codes are marked on the serial number tag applied to each unit.

To prevent corruption of the discrete identification code by any video that might exist on the selected field or line, it is necessary to "strip" off the existing video on that field and line prior to insertion of the code.

This "line strip" function and code insertion is Remote Controlled by the TTL input connected at the screw terminals on the RLDU. A TTL "LOW" on the Remote Control input initiates the line strip and code insertion. A TTL "HIGH" on the Remote Control input prevents line strip and code insertion. This passive equipment state allows upstream data to pass through the unit unchanged.

When the RLDU receives its own signal being looped back from another location an alarm state is detected. The alarm state operates the video A/B switch and an audio A/B switch capable of switching the balanced mono audio signal along with the video. A separate C form dry contact relay is provided for other remote control features. Both normally open and normally closed contacts are available using the screw terminal connections on the unit.

The video signals coming to and from the class room are connected to the BNC "female" video connectors on the unit. The video signals going to and from the MPEG/ATM network are connected to the BNC "female" video connectors on the unit. The A/B video switch for by-passing the MPEG/ATM loopback latency problem is an integral part of the class room video input and output connectors. During an alarm state, the class room video input is connected to the class room video output effectively returning the class room video to the class room monitors without any latency or delay in the video signal.

LOOP BACK BY-PASS TEST

A test can be made to verify proper operation of the RLDU. After the unit is installed the loopback condition can be tested by disconnecting the cables coming from the MPEG ENCODER and MPEG DECODER, then simply connect a short by-pass video cable from the connector marked "MPEG DECODER" to the connector marked "MPEG ENCODER". This will simulate the loopback condition and signal the equipment to switch the classroom video to "B" or return the classroom video back to the classroom. TTL must be "LOW".

CARE AND MAINTENANCE

There is no routine maintenance or calibration required with this equipment. There are no routine maintenance controls to adjust inside the box. Open the box if necessary only to choose the desired operating channel/code.

APPLICATIONS (WHERE TO USE THE SYSTEM)

This system can be used anywhere that a video signal with coax cable exists. Some uses are in CCTV camera installations, LASER OPTICAL transmission, STL microwave applications, Broadcast TV transmissions, ATM/Digital Paths, Cable TV, Alarm and Control and many other uses.

PROGRAM CODE SELECTION AND SERIAL NUMBER

This section explains how to read the code programming switches to change or restore the discrete address tag code for the RLDU. Each RLDU comes from the factory with a discrete address code that can be changed in the field. It is suggested that you contact the factory for an un-used code number so that codes are not duplicated in the system. CALL 1-800-235-6960.

The serial number of any RLDU is the discrete code used to program the unit. Here is the Key to identifying the code.

SWITCH ON = 1, AND SWITCH OFF = 0

VIDEO	LINE CODE						E/O	NUMERIC CODE	
	D	C	B	A	E	F	--DO NOT CHANGE--	LINE #	
							G	P	
10	VI	0	0	0	0		1	= EVEN FIELD	
11	VI	0	0	0	1		0	= ODD FIELD	
12	VI	0	0	1	0				
13	VI	0	0	1	1		F		
14	VI	0	1	0	0				
15	VI	0	1	0	1		1	= TWO FIELD	
16	VI	0	1	1	0		0	= ONE FIELD	
17	VI	0	1	1	1				
18	VI	1	0	0	0				
19	VI	1	0	0	1				
20	PIC	1	0	1	0				
21	PIC	1	0	1	1	-----		MPEG	
22	PIC	1	1	0	0	-----		PREFERRED	
23	PIC	1	1	0	1	-----		SETTINGS	
24	PIC	1	1	1	0				
25	PIC	1	1	1	1				

The Code Switches marked A-F may be changed to place the data signal onto any TV Line from line 10 to Line 25, Odd or Even Field. Switch F selects 2 field or single field code insertion.

WARNING CHANGE ONLY THE SWITCHES MARKED A-F. THE OTHER SWITCHES CONTAIN THE DISCRETE LOCATION CODE FOR YOUR UNIT.

This code is marked on the serial number tag for this unit. If the switches are changed by accident, you can return them to their correct position by reading the code from the serial tag and reprogramming the switches to that number code. If any two units in the system are programmed to the same code number, a double loop back will occur. This double loop back will indicate that two units are on the same code settings. Contact the other operator and determine which unit is set incorrectly and reset the code for the number on the serial number tag. It is suggested that all RLDU units in the system be set for the same Line and Field of video.

UNIT RE-CALIBRATION

No routine maintenance is required on the RLDU. The unit is factory set for optimum performance. If the unit is not functioning properly Please call the factory at: 1-800-235-6960. The factory will determine the cause of the problem and if necessary issue an "RMA" Return Material Authorization Number to allow the unit to be shipped back for repair. Mark the RMA number on the outside of the box and ship the unit back to the factory. If field calibration is required, follow the steps in thier proper order. Be sure to terminate the video with 75 Ohms.

FIELD RE-CALIBRATION PROCEDURE

The following equipment is required to recalibrate the RLDU.
1. Precision Video Generator. 2. Video Wave-form Monitor or Oscilloscope & IRE filter with a 75 Ohm termination.

There are three adjustments to be made to complete the unit re-calibration. Connect a Precision Video Generator to the units BNC connector marked "CLASS ROOM OUTPUT". Next connect the Video Wave-form Monitor or Oscilloscope to the BNC connector marked "MPEG ENCODER INPUT". If you are using an Oscilloscope be sure to install the I.R.E roll-off filter in line between the unit and the Oscilloscope. This filter is necessary to make correct video level adjustments with color signals. Be sure the Oscilloscope is set for DC input and terminated with 75 Ohms.

VIDEO DC LEVEL ADJUSTMENT (VIDEO CLAMP).

Select a signal on the Video Generator that has a 100% White level output. Open the RLDU unit by removing the 4 screws in the outermost corners of the enclosure. The PC Board has four 1/4" holes that allow access to the control adjustments. Reference the oscilloscope or Wave-form Monitor to ground, then adjust the control marked "VIDEO CLAMP" so that the BACK PORCH or BASE LINE of the video signal is at GROUND.

VIDEO LEVEL ADJUSTMENT (VIDEO LEVEL).

Use the same video input signal as in the previous adjustment. Measure the Peak to Peak video level on the Video Monitor or oscilloscope and set the control marked "VIDEO LEVEL" to exactly 140 I.R.E. units or 1 Volt Peak to Peak.

VIDEO LOOPBACK LEVEL ADJUSTMENT (LOOP LEVEL)

Connect a cable from the "MPEG INPUT" to the "MPEG OUTPUT". Next connect the TTL "+" to "-" or ground. Measure the video level at the output connector marked "CLASS ROOM INPUT" with a scope or waveform monitor. Adjust the "LOOP LEVEL" control for 140 I.R.E. units or 1 Volt Peak to Peak video level.

FIELD RE-CALIBRATION PROCEDURE

DATA LEVEL ADJUSTMENT (DATA LEVEL).

Select a signal on the Video Generator that has no White signal, Black screen only. This will make the data signal easier to see on the Monitor or Oscilloscope. If the Monitor can be selected to view the Line and Field, set the controls to read the same Line and Field that is selected on the unit, (See the Selection Table in this manual to identify the video line and field. Then Adjust the "DATA LEVEL" control for 80 I.R.E units or 0.5 Volts of Data Level.

SYSTEM CONSIDERATIONS

This device is designed to operate in a system with large numbers of locations all with their own discrete code identification tags. For peak performance it is recommended that all locations use the same Line and Field for the Tag Code. If all units are not set to the same Line and Field it would be possible (however unlikely) for the data receiver to be corrupted by live un-striped video. If the video content had the identical shape of the data programmed into a unit, that unit would switch to loop back when the pattern appeared. With the units 10 bit data that condition is unlikely to occur, but it should be considered when programming the switches for operation. Operating all RLDU units on the same Line and field will prevent this unlikely condition from ever occurring.

RLDU AND "COPYGUARD" VIDEO

The RLDU will pass video that is encoded with the scrambling system called "COPYGUARD". The RLDU will not lay its code on the COPYGUARD video signal. The COPYGUARD signal produces extra sync pulses in the vertical interval preventing the RLDU from locating the proper Line and Field for insertion of the discrete code. When the COPYGUARD video signal is sent through the ADC internet transmission equipment, that COPYGUARD synchronization signal is stripped off and a new "correct" synchronization signal is applied which would move the position of the RLDU discrete code and prevent Loop-Back operation in any case. The video clamp on the RLDU is released during COPYGUARD operation to prevent distortion of the video picture. If COPYGUARD protected tapes are used the RLDU will pass the signal without changing the signal in any way.

If RLDU full operation with COPYGUARD video is required, it is recommended that a processing amplifier be placed after the VCR to eliminate the scrambling signal, or use copies of the video tapes without the COPYGUARD encoding.