IPG-4T - IPG-8R

IP NETWORK CAMERA-GUARD

INSTRUCTION BOOK
IB6481-01

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DESCRIPTION

The IPG-4T Camera Guard monitors the communication path on four separate IP camera signals and sends the communication status of each IP camera via an embedded device server to a matching relay output receiver placed anywhere on the network. Use this unit when you have multiple cameras feeding into a network switch and one cable or wireless transmission back to the control point with no other wires to use for control. This supervisory system will identify the loss of any IP video data signal due to removal of the camera, loss of power to the camera, a camera cable disconnect, or a defective camera output.

The IPG-4T continuously displays the "Data on" condition of 4 IP cameras with individual L.E.D. indicators for each of the camera channels A-D. The unit also has 4 input screw terminals to use with an additional standard IPG-4 unit to expand the system for up to 8 monitored IP channels. The axillary channel inputs E-H are for contact switches and will take any kind of switch or relay inputs. Use it to monitor your IP cameras and shut down un-attended gas pumps if the IP camera is tampered with or fails. This unit uses a standard 8P8C network cable to put the IP video loss information onto the network for recovery at the far end near the pump controls. The signals generated will go anywhere on the Ethernet network using TCP/IP protocol.

The embedded device server uses 10/100Mbit Ethernet protocol, auto sensing, stable, field proven TCP/IP protocol, easy configuration through a web interface or by direct Ethernet cable connection, Password Protection capable and Bi-Color LED indicators for Link status, speed, and activity.

The IPG-4T will identify tampering or failure of cameras when it occurs, reducing the liability associated with extended and undetected loss of area security when cameras are rendered inoperative without notification. Then it will put the information out on the network for recovery at any other point on the network.

The IPG-4T Camera Guard can be connected anywhere between the camera and the Monitor equipment and you can then use an Ethernet connection or a wireless link to return the IP Loss signals to another location to shut down pumps or operated alarms. The "High Impedance Loop through Input" will not affect the data or picture quality of the IP video signal even if the power fails. The unit detects the loss of data communication between the IP camera and the network switch and sends IP loss data to a receiver at the other end of the network.

Use this unit in any IP video installation that requires guaranteed continuous video monitoring. Use the IPG-4T to monitor the cameras in sensitive areas like loading docks or any area subject to the unauthorized movement of product or to meet TSSA requirements.

The IPG-4T has an easy mounting flange that will mount to any surface with just two screws and is supplied with a 12 VDC power cube. This unit will pass all forms of P.O.E. Power Over Ethernet on the camera channels and does not use P.O.E. on the network connector. This unit is designed to be used with the matching 8 channel receiver called IPG-8R.

IPG-4T MOUNTING INSTRUCTIONS

The rugged one-piece mounting structure allows you to mount the unit firmly in place with two screws. Select a place to mount the unit away from harsh or wet environments indoors is recommended, however if it is placed outdoors it should be placed in a NEMA enclosure or similar water proof location. The IPG-4T should be located near the IP camera equipment or anywhere along the path of the IP video signal before any network switches or signal combiners. Select a position that gives you the best access to cable the system and reduce the labor in installation. This equipment should not be placed in a public area where tampering could occur.

IPG-8R MOUNTING INSTRUCTIONS

The rugged one-piece mounting structure allows you to mount the unit firmly in place with two screws. Select a place to mount the unit away from harsh or wet environments indoors is recommended, however if it is placed outdoors it should be placed in a NEMA enclosure or similar water proof location. The IPG-4T should be located near the pump shut off equipment or anywhere along the path of the IP video signal after any network switches or signal distributors. Select a position that gives you the best access to cable the system and reduce the labor in installation. This equipment should not be placed in a public area where tampering could occur.

HOW TO CABLE THE IPG-4T

Attach the network cable coming from the IP camera to one of the IP Video 8P8C (RJ-45) connectors on the top of the unit. These connector pairs loop through so you can use either one for the input or output. Then attach a network cable from the other IP Video 8P8C (RJ-45) connector on top of the unit to the local switching equipment. Repeat this step for each of the 4 channels you wish to monitor.

If you are using a standard IPG-4 to double the number of cameras to monitor up to 8 channels connect wire pairs from the contact relay outputs on the IPG-4 over to the 4 screw terminal connectors on the IPG-T unit. The standard IPG-4 monitors the additional IP camera channels and has 4 relay outputs. The relay outputs are wired to the screw terminal inputs on the IPG-4T. Those screw terminals on the IPG-4T unit allow for an extra 4 channels of detection to be sent over the Ethernet to shut down pumps or control alarms.

HOW TO CABLE THE IPG-8R

Attach a network cable coming from the network switch or distribution point for the combined IP cameras to the IP Data Port on the side of the IPG-8R. If the power is applied and the network is live, you should see the LEDs on the network connector begin to flash while the network connection is being established. If the companion IPG-4T is sending valid IP camera signals, you will see the Green LEDs lite up indicating that the camera channels are working. While the network cable is disconnected you will only see the RED LED lite indicating a disconnect of the network cable or discontinuity of the data signal.

POWER SUPPLY INSTALLATION

The IPG-4T is powered by a 12 VDC wall mount power transformer. Just plug the 5.5mm X 2.5mm barrel connector into the jack marked "12VDC ". The Green LEDs will only lite up if the IP Cameras are connected and the IP video is on. There are no LED indicators on this unit for the additional 4 relay inputs at the screw terminals. The IPG-8R unit is powered by a 12 VDC power cube and is connected to the green screw terminals marked "12 VDC".

WARNING: Be careful to only connect the power supply to these two screw terminals and no other terminals, as voltage connected to the other terminals could damage the equipment or blow the fuse in the power cube. The power supply terminals have directing diodes inside the unit so that either polarity of 12 VDC can be connected to the input terminals. It does not matter which one is positive or negative for connection.

OPERATION

When all the cables and wires are connected, the IP cameras are on, and the power is on you should see 4 green LEDs on the IPG-4T and the network connector will show the following depending on the connection speed and duplex or simplex operation. Here is the network LED indication table.

NETWORK CONNECTOR BI-COLOR LED TABLE

LEFT SIDE LINK LED		RIGHT SIDE LINK LED	
OFF	No Link	OFF	No Activity
Amber	10 Mbps	Amber	Half-Duplex
Green	100 Mbps	Green	Full-Duplex

CARE AND MAINTENANCE

There is no routine maintenance or calibration required with this equipment.

APPLICATIONS (WHERE TO USE THE SYSTEM)

This system is used where IP cameras must be monitored, and the IP camera signals are combined or connected to a switch for later transmission over wireless or on a single Ethernet cable and no other way to send contact relay information exist. The purpose of these units is to send the IP video loss signals multiplexed with the camera information where regular cabling is difficult or not economically feasible.

GROUND LOOPS THAT CAUSE INTERMITTANT DATA

The IPG-4T and IPG-8R are completely isolated from ground to prevent ground loops from occurring due to installation of the Camera Guard. Each camera connection is also isolated from each other to prevent ground loop creation. The IPG-4T and IPG-8R will not induce ground loops in the data signal.

TROUBLE SHOOTING THE DATA SIGNAL

The IPG-4T IP Camera Guard monitors the data flow from camera to the data switch and any other switches that might be in the system. The unit detects the loss of data transmission and sends a signal to the IPG-8R to operate a relay to control pumps and other equipment. IP signals to be monitored by the IPG-4T will work best when the IP video data is operating at full frame video, or high frame rate setting on the camera.

Features like built-in IP camera motion detection that only sends data when motion is detected by the camera should be avoided as they radically reduce the amount of consistent data flow and can cause a video loss detection to occur. Frame rates of 30 frames per second is suggested with data rates set on low settings to even out the data flow. The purpose of these setting is to provide as continuous a flow of data as possible. The IPG-4T is monitoring the amount of data, so if the camera data is sent in quick bursts at high data rates and has long periods of no data transmission in between the unit will consider that a loss of data transmission and operate the relays accordingly. If the IPG-4T is placed after a data compressing switch or repeater that causes the data flow to be compressed with long gaps in the data transmission this can cause the unit to detect the long gaps in data flow as a failure of the video.

An indication of low data transmission can be determined by examination of the Green LED lights on the IPG-4T unit. If the data rate is too low or un-even you may observe these LED lights flickering or very dim and the relays could be turning on and off. This is a visible indication of low data traffic and the frame rate on the camera should be selected to a high rate. Check to see if the camera has any feature like built-in motion detection and turn it off in the camera. If you suspect that a data switch or repeater is compressing the data by raising the data rate and sending it at a higher Bit per second rate, then temporarily move the unit to the input to the switch and see of you get the same results. If the unit operates normally ahead of the switch, then the switch should be replaced with one that does not re-configure the data flow.

If motion detection is needed to extend record time, do the motion detection and reduction at the NVR in the recording setting and not in the camera itself. The IPG-4T uses the data traffic of or amount of data sent by the camera to detect a loss of data so any equipment that diminishes that data flow can affect how the unit operates the relays in the IPG-8R. Set the camera setting for the best continuous flow of data possible for the best Camera Guard operation.

STORE AND FORWARDING AFTER CARRIER LOSS

When there is a loss of communication between the IP loss detector IPG-4T and the IPG-8R receiver the Red LED will come on in about 5 seconds, this delay is designed to allow for short periods of network signal loss without affecting the IPG-8R relay output, and also the pumps that they control. Also, during a data carrier loss, the IPG-4T continues to monitor and store the IP camera information for about 12 seconds, and when the carrier returns, and the network connection is re-established the IPG-4T will transmit the stored sequence of data stored in the units input buffer for the first 12 seconds.

RE-ADDRESSING THE UNITS

Both the IPG-4T and IPG-8R come from the factory with pre-programed working addresses and individual MAC address for each unit. The MAC address is located on the sub-board module inside the unit and can be read using the "DeviceInstaller" software download.

The factory loaded address for each unit are as follows:

	IPG-4T		IPG-8R
Address:	192.168.2.31		192.168.2.36
Sub-Net:	255.255.255.0		255.255.255.0
Gateway:	192.168.2.1		192.168.2.1
Port:	10001	SEE PORT # WARNING	10001

There are two ways to change the address and communication information, direct Ethernet connection from a PC using a downloadable access interface, or by using the WEB based interface.

DIRECT ETHERNET CONNECTION

To use a direct Ethernet connection to program new IP Addresses into the IPG-4T and IPG-8R units the easiest way is to use the Lantronix "DeviceInstaller" utility. You can download it at: WWW.LANTRONIX.COM. Click on "KNOWLEDGE & SUPPORT", then "TECHNICAL SUPPORT", and down load the "STAND-ALONE DEVICEINSTALLER". This downloaded program will allow you to Locate the units on a network and Change the units IP Addresses when they are powered up.

If you are connected to either the IPG-4T or the IPG-8R unit you can use this utility to view and change the addresses of the units. CAUTION: you must have the Ethernet card on your computer set to a static address that includes the first three octets in the existing IPG-4T or IPG-8R units (192.168.2.xxx) or the software will not be able to locate the devices and you must use "Cross-over" IP cable connection.

CONNECTION THROUGH IP SWITCHES

You can also access the units to change the address through any router by using the same method and by using a "Straight" wired IP cable connection.

THE DEVICEINSTALLER UTILITY

You can read more about use of the software utility by opening the "DeviceInstaller Help" document that downloaded with the "DeviceInstaller" utility. CAUTION: Do not change any of the operating settings other than the IP Address, Subnet Address, and Default Gateway Address. Changes can be made that will disable the operation of the devices or cause them to malfunction. If you change the Address of the IPG-4T transmitter unit, you must also change the "Remote Host" address in the IPG-8R receiver unit to match the IPG-4T address. The "Remote Host" address can be accessed by using the DEVISEINSTALLER on the IPG-8R and click on "WEBHOST" and then go to "Connections" and fill in the same IP address used by the IPG-4T unit. This action creates a "Serial Tunnel" for the data to communicate between transmitter and receiver. It is suggested that IP addresses only be changed when it is required by the system.

CAUTION: Do not change the Port number unless absolutely necessary. If you must change the port number be aware that there are RESERVE port numbers that can not be used. Here is a list of the restricted port numbers. If you use one of these port numbers the devices will stop working and you could become "locked out" and you may lose the ability to access the units. Here is the list or reserved, restricted port numbers:

DO NOT USE THESE PORT NUMBERS:

1-2024	Reserved (well known ports)
9999	Telnet setup
14000-14009	Reserved for Redirector
30704	Reserved (77F0h)
30718	Reserved (77FEh)

WARNING: We recommend that you not use the reserved port numbers for this setting as incorrect operation may result.