

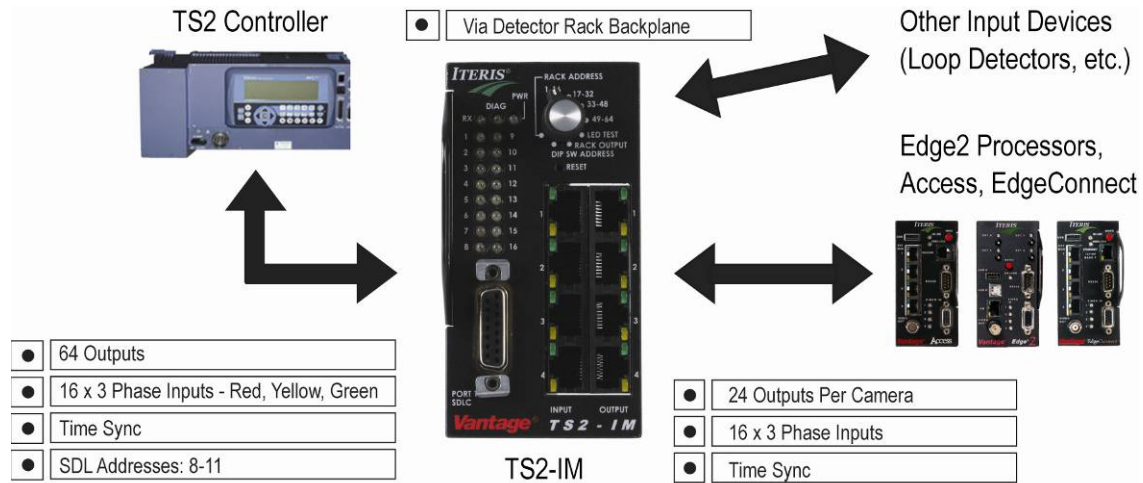
Vantage®

TS2-IM Module



iteris®

1. Introduction



The Vantage TS2-IM module is an enhanced Bus Interface Unit (BIU) designed to allow Iteris video detection systems to communicate directly with TS-2 controllers using standard TS-2 protocols on the SDLC bus.

The TS2-IM passively monitors controller phase information, and can pass this information to the Vantage Edge2 processors to allow for greater detection flexibility. The module also allows the Edge2 processors to pass detector information directly to the TS-2 controller; simplifying the task of mapping TS-2 detection outputs. This new module affords our Vantage TS-2 users seamless integration of their Vantage hardware in their existing TS-2 Type 1 or Type 2 cabinets.

The TS2-IM can serve as a hub for up to four Edge2 processor modules and is capable of providing up to 64 detector output channels using BIU addresses 8-11. The TS2-IM is NEMA TS-2 compliant, mounts into any standard BIU rack slot, and can even be used as a replacement for a standard BIU module in TS-2 cabinet detector rack.

Features

- Can plug into any standard BIU rack slot
- NEMA TS-2 compliant with full BIU functionality
- Up to 64 detector outputs
- Passively monitors TS-2 controller phase information and makes that information available to the Edge2 processors
- Easy mapping of detection outputs to the TS-2 controller using four standard BIU addresses
- Serves as a hub for up to four Vantage Edge2 processors
- Allows seamless integration of Edge2 processors in NEMA TS-2 Type 1 or Type 2 cabinets
- Fully functional BIU, can be used as a standard BIU module replacement in a TS-2 cabinet detector rack

2. TS2-IM Hardware, Firmware, and Software Requirements

Controller / Cabinet Hardware

Important: Some TS-2 hybrid configurations may require an MMU to be connected and operational in the cabinet in order to obtain controller phase information. The TS-2 hybrid configuration in question consists of a TS2 hybrid controller connected to a detector rack BUI on the SDLC buss. This type of cabinet usually has a CMU instead of an MMU. Since the TS2-IM module uses phase information transmitted from the controller to the MMU, if there is no MMU present then phase information may not be sent. In there is no phase information sent, then the TS2-IM will not be able to receive it.

Vantage Hardware

The TS2-IM module is compatible with the Edge2 "04" (single and dual channel), "05" (Edge2-4) and Edge2 "06" (single and dual channel) series processors that have two USB ports. Older Edge2 processor hardware is not supported on this platform.

Firmware

To use Edge2 processors with the TS2-IM module the following firmware requirements must be observed. Edge2 "04" series processors need to be running 04.01.13 firmware or later. Edge2-4 processors need to be running 05.01.13 firmware or later. Edge2 "06" series processors can be running any version of firmware. EdgeConnect and AccessNM modules can be running any version of firmware.

Software

The TS2-IM module requires the use VRAS version 3.1.3 or later.

3. TS2-IM Operation

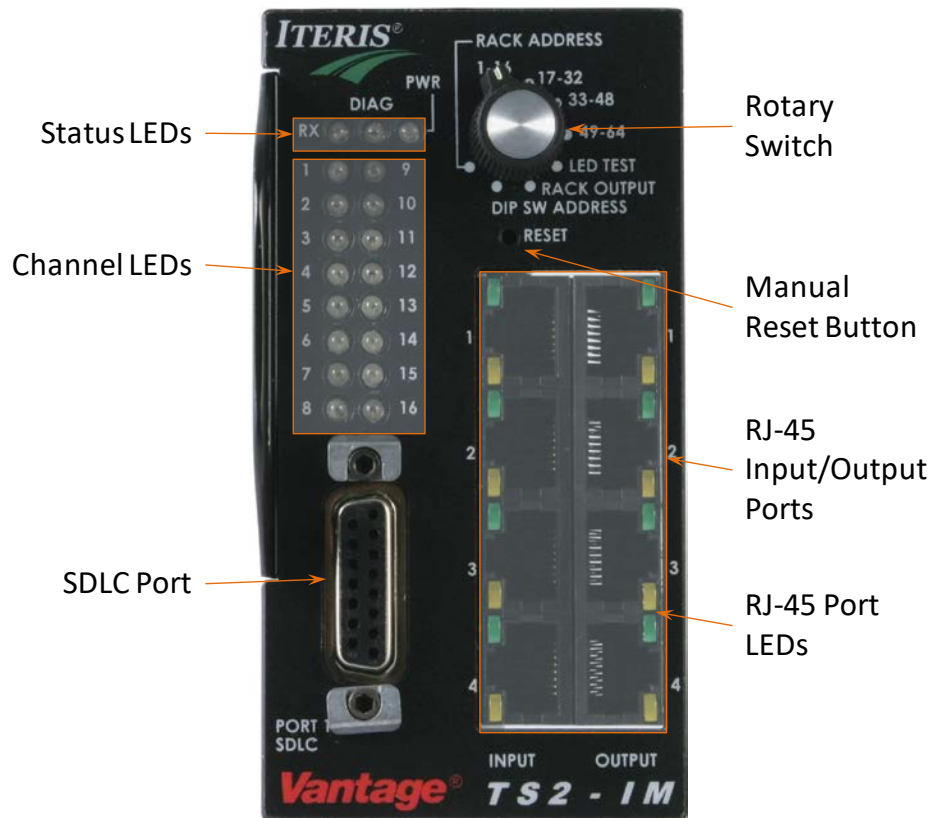
Note: The user should already be familiar with TS-2 cabinets, the associated equipment, and its operation. This manual will only cover TS-2 operation as it pertains to the operation of the TS2-IM module and TS-2 VRack. For detailed TS-2 information refer to the cabinet and equipment manufacturer's documentation.

In addition to all its special features, the TS2-IM is a fully functioning BIU. It can replace a normal BIU in most standard TS-2 cabinets.

The following sections explain the various features of the TS2-IM module.

- Switches, Ports, and Indicator LEDs
- TS2-IM BIU DIP Switch Settings

3.1 Switches, Ports, and Indicator LEDs



Front Faceplate of TS2-IM Module

Indicator LEDs

1. **Power LED** - This LED should always be "On" solid green when the module has power. If this LED is not illuminated then check be sure the module is getting power.
2. **DIAG LED** - The diagnostic LED should always be "Off". If the red diagnostic LED is "On" or flashing, this indicates an internal operational error and the module will need to be sent in for evaluation.
3. **RX LED** - The yellow receive LED blinks when the SDLC port is connected and the TS2-IM is receiving data packets. The RX LED should be blinking or on solid during normal operation to indicate communication with the TS2-IM module is taking place. If this LED is not blinking, or not on solid, check your SDLC connections and controller programming.
4. **Channel LEDs** - The red Channel LEDs can indicate channel calls or other different conditions depending on the setting of the front panel rotary switch. When a red Channel LED is "On", this indicates an active state. See the rotary switch description for more detailed information.
5. **RJ-45 Port LEDs** - When an Edge2 processor is hooked up to a Input RJ-45 port, and the port is enabled, the Green LED will be on solid and the Yellow LED will blink approximately 3 or 4 times a second. If the port has been placed in "Listen Mode", the port is enabled, and an Edge2 processor is connected, the Yellow LED will blink more slowly; about twice every second. Ports in Listen Mode should be enabled. If the port is disabled and an Edge2 processor is connected, the Yellow LED will flash one time every

second. The port must be enabled for communication to take place. If the Yellow LED stays on solid, it usually indicates a processor was connected and communicating on the RJ-45 port, but has been recently removed. See the section on DIP switch settings for more information on "Listen Mode".

Switches & Buttons

6. **Rotary Switch** - This switch controls what information will be displayed by the Channel LEDs. If a red Channel LED is "On", this indicates an active state.

Rack Address - This selection will cause the Channel LEDs to display the physical address (jumper setting) of the TS- 2 VRack (8, 9, 10 or 11) or the address of the TS-2 cabinet detector rack that the TS2-IM is installed in.

[1 - 16] - This switch selection will display the TS-2 calls for channels 1 – 16 on the Channel LEDs.

[17 - 32] - This switch selection will display the TS-2 calls for channels 17 – 32 on the Channel LEDs.

[33 - 48] - This switch selection will display the TS-2 calls for channels 33 – 48 on the Channel LEDs.

[49 - 64] - This switch selection will display the TS-2 calls for channels 49 – 64 on the Channel LEDs.

LED Test - When this switch position is selected, the DIAG LED and all the Channel LEDs should come "On". LEDs that do not illuminate may need to be replaced.

Rack Output - This switch position will cause the Channel LEDs to display the physical contact closure outputs being placed in the three TS-2 VRack processor slots. Physical channels will be dependent on the TS-2 rack address jumpers. For example on a TS-2 VRack, if the rack is jumpered for address 8, the processor slots will show up as channels 1 - 16. See the section on TS-2 VRack slots in the TS-2 VRack manual for more information. If the TS2-IM is installed in a standard TS-2 detector rack, the physical contact closure detection calls will be dependent upon the rack address and the TS-2 calls will also be displayed by the Channel LEDs.

DIP Switch Address - This selection will cause the Channel LEDs to display the address or addresses that are set on the BIU Address DIP switches on the TS2-IM module (8,9,10,11).

7. **Manual Reset Button** - The reset button will force the TS2-IM module to reset. The button is recessed into the faceplate to prevent accidental activation. Pressing the button may require a narrow object like a paper clip. When the TS2- IM module resets, all the LEDs will momentarily go "Off" and then momentarily stay "On" for about one second before resuming normal operation.

Ports

8. **SDLC Port** - The SDLC port is the communication port for the TS2-IM module. Connect the TS-2 cabinet SDLC connector here.
9. **RJ-45 Input/Output Ports** - These ports are where Edge2 processor modules plug into the TS2-IM module. You can plug Edge2 processors into any of the four INPUT RJ-45 ports (1-4). The OUTPUT RJ-45 ports (1-4) can be used for an EdgeConnect module or other Edge2 accessory modules.

3.2 DIP Switch and Jumper Settings

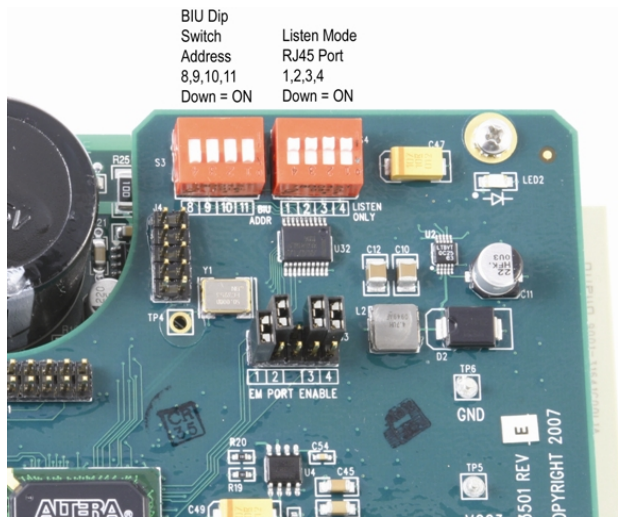
BIU Address

The TS2-IM module BIU address can be set by using a set of DIP switches located on the top circuit board as shown in the picture below. The first four switches numbered 1-4, correspond to addresses (11, 10, 9, 8) respectively. These can all be used at once or in any combination, since it is a virtual assignment. This means that if all four BIU Address DIP switches were "On" (Down), the full complement of 64 outputs would be available to the end user. If only the first switch was "On", that would enable address 11 and channels 49-64. If the second switch was "On" that would enable address 10 and channels 33-48 and so on.

Listen Mode

Most often, for normal TS-2 operation, the second set of DIP switches should remain in the "Off" position. The second set of DIP switches on the right, as shown in the picture, are for allowing an Edge2 processor module to operate in physical contact closure mode and still have access to Red, Yellow, and Green status information from the TS2-IM. We call this "Listen Mode", and as the name implies, when this mode is selected the associated RJ-45 port will only "listen". The DIP switches correspond with RJ-45 Inputs on the front of the TS2-IM module. By turning "On" a DIP switch, the corresponding RJ-45 port (1-4) and the Edge2 processor module that is plugged into it, will have "Listen Only" access to Red, Yellow, and Green status information from the TS2-IM module. However, realize when a DIP switch is "On", the RJ-45 port and processor can only "listen" and cannot place any TS-2 outputs over the SDLC bus. Only the normal processor output channels 1 through 4 will be available to that Edge2 processor.

Do not use these DIP switches in the "On" position (Listen Mode) for normal TS-2 operation; they will be used primarily for special applications. If you cannot get an output for any of the TS-2 outputs on your Edge2 processor, it is a good practice to check and see if one of these DIP switches has inadvertently been turned "On". If these switches are "On", turning them "Off" may solve your problem.



TS2-IM DIP Switches S3 & S4

DIP Switch S3 (BIU Address)	Switch State	RJ-45 Port	Outputs
1	On	11	49 – 64

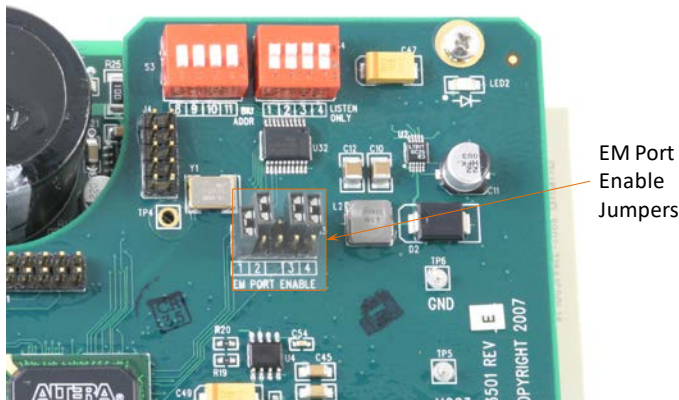
2	On	10	33 – 48
3	On	9	17 – 32
4	On	8	1 -16

DIP Switch S4 (Listen Mode)	Switch State	RJ-45 Port	Listen Mode
1	On	4	Active
2	On	3	Active
3	On	2	Active
4	On	1	Active

✔ **Note:** When Listen Mode is active, Edge2 processor TS-2 outputs are not available.

EM Port Enable

You will find a set of on-board jumpers labeled "EM PORT ENABLE" on the TS2-IM module, as is shown in the following picture.



EM Port Enable Jumpers

These jumpers are a safety feature that will place constant calls on the detection channels associated with the BIU Address DIP Switches that are set "On" whenever communication is lost on an RJ-45 port that is assigned as "Enabled". The EM Port Enable jumpers enable the selected RJ-45 port and tell the TS2-IM module what RJ-45 ports will have active connections with Edge2 processors. The TS2-IM module will expect to see communications on these ports. If an Edge2 processor should fail and stop communicating, and the EM Port Enable jumper is "Enabled" (Jumper is shorted across both pins), the TS2-IM module will place constant calls for the failed (non-communicating) module. It is therefore very important that the user set these jumpers correctly, enabling all used RJ-45 ports during the initial setup process. There are actually five jumper positions, however only four will be used. The middle jumper position is not used. The other jumper positions are labeled 1-4 corresponding to the RJ-45 ports on the front of the TS2-IM module. To enable an RJ-45 port, place a jumper across the two pins with the number position that corresponds to the port you wish to enable. For instance, placing a jumper across position 2 will enable RJ-45 port 2 and so on. The factory default configuration is all jumpers "Off" or all RJ-45 ports disabled.

Important: Realize that if the RJ-45 port is not enabled using the correct EM Port Enable jumper, that RJ-45 will remain inactive and will not communicate with an Edge2 processor connected to it. Be sure

to enable the RJ-45 ports that you intend to use. Also, do not enable RJ-45 ports that you are not using since constant calls will result. An enabled RJ-45 port without communication is assumed to be a failed processor and for safety reasons this will result in constant calls. Unused jumpers or jumpers in the "Off" position from the factory will be set so they are only on one pin, keeping them in place for future use while not shorting the contacts to create an "On" condition. Refer to the picture above for an example of this practice.

[TS2-IM as a Replacement BIU](#)

As mentioned earlier, the TS2-IM module is a fully functional BIU and can even be used as a standard BIU replacement in a TS-2 cabinet detector rack. To use the TS2-IM as a standard BIU in a TS-2 detector rack, turn all of the Address DIP switches (8, 9, 10 and 11) and Listen Mode DIP switches "Off". The TS2-IM will pick up its address directly from the detector rack.

4. TS2-IM Time Synchronization

The TS2-IM module is capable of syncing with the time set in the TS-2 cabinet controller. When the TS2-IM module gets the time from the cabinet controller, it serves as a master for all the Edge2 processor modules that are connected to it. The TS-2 controller is the time master of the cabinet, the TS2-IM module is the time master of the TS-2 VRack or detector rack and all the Edge2 processors connected to it. There is no need to set the Edge2 processor time, since it will synchronize with the TS2-IM module time at the top of every minute.

5. TS2-IM General Setup & Installation Steps

1. Configure the TS2-IM module Jumpers and DIP switch settings.
 - a. Enable EM Port Enable jumpers for all used RJ-45 ports.
 - b. Select BIU Addresses 8, 9, 10, and or 11 by turning "On" DIP switches 1 through 4 on the first DIP switch depending on how many detection channels you require.
 - c. Select RJ-45 ports to enable "Listen Mode" by turning "On" DIP switches 1 through 4 on the second DIP switch. The DIP switch number (1-4) corresponds to the RJ-45 Input port on the faceplate of the TS2-IM module.

Note: For normal TS-2 operation all these DIP switches should remain in the "Off" position. When "Listen Mode" is enabled for a particular port, that port will not have any TS-2 outputs available to the Edge2 processor. Only the four regular Edge2 processor contact closure outputs will be available. "Listen Mode" is primarily used for special applications. If you are unsure, it is best to leave all four of these DIP switches "Off".

2. Plug the TS2-IM module into the detector rack BIU slot or into the BIU slot of the TS-2 VRack. The TS2-IM module is hot swappable. The green "PWR" (Power) LED should be blinking or come "On" solid. Configure the TS-2 VRack switches and jumpers if it is being used.
3. Plug the Edge2 processors into the rack. Using an Extension Module cable, plug one end of the cable into the Edge2 processors "EM" (Extension Module) RJ-45 port and plug the other end of the cable into the TS2-IM's "INPUT" RJ-45 port. The Input RJ-45 port Green LED will be on solid and the Yellow LED will blink approximately once every 500 milliseconds.

4. Plug the SDLC cable into the SDLC port on the front of the TS2-IM module. The yellow (RX) transmit LED blinks or remains solid when the SDLC port is connected, and the TS2-IM is receiving data packets. The RX LED should also be blinking or remain solid during normal operation to indicate communication with the TS2-IM module is taking place. The diagnostic LED should always be "Off".

✓ *Note: Do not use more than one TS2-IM in an Edge2 processor chain.*

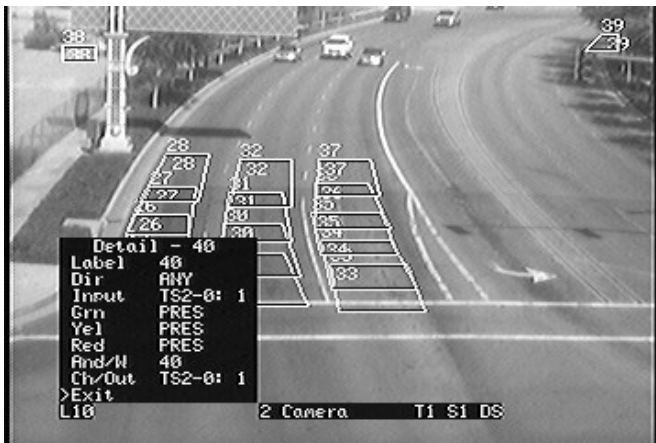
5. Make sure the proper vehicle phase recalls are "On" while you are drawing the detection zones. Draw your zones in each of the Edge2 processors and assign them to one of the available TS-2 output channels.

✓ *Note: For normal operation, do not assign the same TS-2 channel on more than one camera view. If multiple camera views share the same output channels, vehicle calls may cancel one another out resulting in missed or dropped detection outputs. If TS-2 outputs do not show up as a valid choice on the Edge2 processor, check your connections and make sure you are not inadvertently in "Listen Mode". See the following section on TS-2 output assignment. Finish configuring each of the Edge2 processors. For detailed information on the Edge2 processor configuration consult the Edge2 processor installation and user manual.*

6. Be sure to configure the TS-2 cabinet controller correctly, check that the time is set correctly in the controller since the Edge2 processors will be getting their time settings from it.

5.1 Edge2 Processor TS2 Output Assignment

When the TS2-IM module is properly installed and configured, the TS2 output channels will show up as valid choices on the Edge2 processors menu.



Screen Capture of Edge2 Processor Menu Firmware 04.01.13

Notice the "Input" menu items value "TS2-0: 1", the "1" stands for controller loadswitch one (phase one in this case). This means that the following Green (Grn), Yellow (Yel), and Red will use phase one information to determine what this zone will do during each condition. In this example when phase one is Green, Yellow, or Red, the zone will operate in the presence (PRES) detection mode. The "Input" menu parameter can be set to

monitor any of 16 available loadswitches (1-16). The Green, Yellow, and Red menu parameters can be any of the available zone types.

Next, notice the "Ch/Out" menu item is also "TS2-0: 1". However, in this case, the "1" refers to TS-2 channel one. This zone will place a call to TS-2 detector channel one. The "Ch/Out" parameter could be set to any of 64 TS-2 detector channel outputs. For example, "TS2-0:10" would tie this zone output to TS-2 detector channel 10. When this zone is active, a call would be placed to the controller on TS-2 detector channel 10.


6. TS2-IM Module Specifications

Technical Specifications	Switch State
Power	+24VDC 160mA
Connections	
Backplane	Standard TS-2 BIU connector
Vantage	8 x RJ-45 receptacles
SDLC TS-2	DB-15 connector
Indicators and Controls	16 x LED's for call information status
	3 x LED's for power, communications and diagnostic
	8 point selectable mode switch for setup and operation
Environmental	-30°F to +165°F (-34°C to +74°C)
	0% to 95% humidity, non-condensing
	0.5G, 3 axes for shock testing
Mechanical	7"L x 4.5"H x 2.31"W (178mm x 114mm x 59mm)
	0.66lb (.3kg)
Warranty	3 year limited warranty
Regulatory	NEMA TS-2 compliant

7. Product Support

[Product Support Team](#)

The Iteris® Product Support Team consists of a group of highly skilled individuals that are knowledgeable and readily available to answer your questions or assist you with any of our Vantage products. Please do not hesitate to contact us at:

 Toll free: (888) 254-5487

For more information on Iteris, as well as the products and services that we provide, visit our website at:

 www.iteris.com

[Iteris Resource Center](#)

This site contains additional training and technical support information covering the whole range of Vantage products. Registration is easy. Visit the address below to register and begin enjoying the benefits immediately.

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