Versus™ Information System

User Guide

Note: Versus Sensory Network (VSN™)

VSN™ uses Infrared and Radio Frequency technology to deliver precise location-specific information. VSN™ is marketed directly to medical facilities and through a network of authorized System Integrators. Because Versus Technology, Inc. is constantly improving its products, specifications within all Versus manuals are subject to change without notice.

Revision Date: March 2015

Proprietary Information – *Do Not Distribute*

FCC STATEMENT: Components comply with part 15 of the FCC Rules. Operation is subject to the following two conditions: 1) These devices may not cause harmful interference, and 2) These devices must accept any interference received, including interference that may cause undesired operation.

FCC CLASS A STATEMENT regarding the Versus Ethernet Concentrator: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC CLASS B STATEMENT regarding the Versus Collector: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio / TV technician for help

Modifying or tampering with the transceivers' or receivers' internal components can cause malfunction, invalidate the warranty and void FCC authorization to use these products.

CANADA STATEMENT:

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

⚠ Danger!

■ Handling Alkaline Batteries

- Should fluid from the battery accidentally get into your eyes, there is a threat of loss of eyesight, do not rub them. Immediately rinse your eyes with clean tap water and then consult a physician immediately.

⚠ Caution!

■ Handling Alkaline Batteries

- Immediately remove batteries when they have lost all power. Leaving the batteries in the unit for a long time may cause the batteries to leak fluid, overheat or explode due to gas that is generated by the batteries.
- Remove the batteries from the unit when not using the unit for an extended period of time. The batteries may leak fluid, overheat or explode due to gas that is generated by the batteries.

- Do not apply solder directly to the batteries. The heat may cause the batteries to leak fluid, overheat or explode.
- Do not store the batteries in the direct sunlight or in a car on a sunny day when it is very hot. The batteries may leak fluid, overheat or explode.

- When storing or disposing of the batteries, cover the terminals with tape to insulate them. Mixing them with other batteries or metal objects may cause the batteries to leak fluid, overheat or explode.

- Do not get the batteries wet. Doing so may cause the batteries to overheat.

⚠ Warning!

■ Handling Alkaline Batteries

- Do not put the battery in a fire, expose it to heat, dismantle or modify it. If the insulation or safety valve is damaged, the battery may leak fluid, overheat or explode.
- Do not insert the battery with the poles reversed. Doing so may cause some abnormality or a short and the battery may leak fluid, overheat or explode.

- Keep the battery out of the reach of children. If the battery is swallowed, contact a physician immediately.
- If the alkali fluid gets in your mouth, rinse your mouth with water and contact a physician immediately.
- If the alkali fluid gets on your skin or clothes, it may burn your skin, thoroughly rinse the affected area with tap water.

- Do not store batteries with metal objects such as necklaces or hairpins, doing so may cause the positive and negative poles to be shorted.
- Do not mix new and old batteries or other makes of batteries. The different attributes may cause the battery to leak fluid, overheat or explode.
- This battery was not made to be recharged. Recharging this battery may damage the insulation or internal structure and may cause the battery to leak fluid, overheat or explode.

- Do not damage or remove the label on the exterior of the battery. Doing so may cause the battery to short, leak fluid, overheat or explode.
- Do not drop, throw or expose the battery to extreme impact. Doing so may cause the battery to leak fluid, overheat or explode.
- Do not alter the shape of the battery. If the insulation or safety valve is damaged, the battery may leak fluid, overheat or explode.

Table of Contents

1.   Introduction

A.   Purpose of This Guide

This document is intended to provide the information required to install the hardware, sensory network and wiring components of a Versus V-Direct™ Locating System. Read this entire document before proceeding with the installation. A general understanding of wiring/telephone installation tools and techniques is assumed.

B.   Computer Requirements

The minimum computer specifications listed are based on a single, middle- to large-sized department. Sites deploying multiple departments or a campus-wide solution may consider a higher end hardware platform. The scope of current and future workflow processing, number of concurrent client workstation and integration connections and total count of tracked badges/tags should be taken into consideration when determining the proper hardware platform.
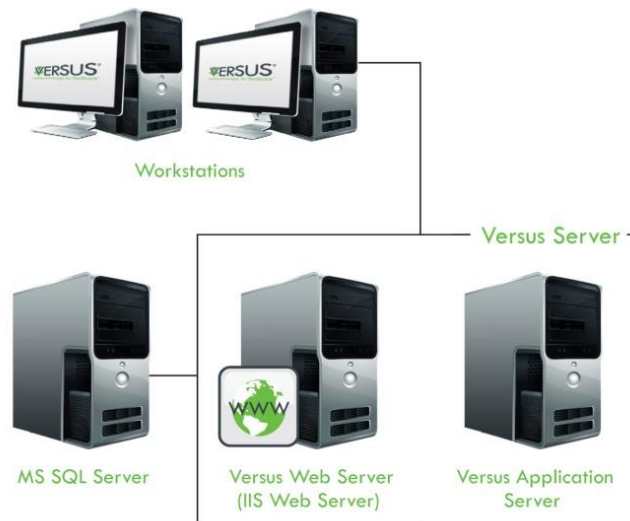
1.   Versus Application Server

The application server is a dedicated system (physical or virtual machine) that manages all server-side processing and data communication for the Versus solution.

To support Web service integrations, reporting services and mobile device applications, IIS is enabled on the Versus Application Server; an existing IIS server can be utilized.

Hardware Minimums	• Dual Core Processor • 8 GB Memory • Dual 160 GB Hard Disk
Software Compatibility	• Microsoft Windows Server 2008, 2008 R2, 2012 • Microsoft IIS 7 (or higher) • Simple Mail Transfer Protocol (SMTP) • .NET 3.5 & 4.5 Framework • Java Standard Edition

2. Microsoft SQL Server Requirements

Microsoft SQL Server maintains historical location and process event information that enables tracking reports and workflow analytics. The Versus reporting services rely on a dedicated SQL Server system or can reference an existing SQL instance already maintained by the facility.

Facilities are responsible for managing database backups and SQL Server integrity.

Hardware Minimums	• Dual Core Processor • 8 GB Memory • Dual 160 GB Hard Disk
Software Compatibility	• Microsoft Windows Server 2008, 2008 R2, 2012 • Microsoft SQL Server 2005, 2008, 2008 R2, 2012

3. Client Workstations

Windows-based desktops, Citrix-established workstations and laptop computers provide users the ability to run the Versus client-based applications. The client workstation software allows easy Glance-n-Go™ viewing, ability to enter information and clinical grade reporting for tracking and analytical efficiency measurements.

Hardware Minimums	• Pentium 4 @ 2.4 GHz • 4 GB Memory • 100 GB Hard Disk
Software Compatibility	• Microsoft Windows 7, Windows 8 • Microsoft .NET 3.5 Framework • Microsoft Internet Explorer 9 (Compatibility Mode) • Adobe Reader 10 (or higher)

C.   Terms and Definitions

The following terms will be used throughout this hardware installation guide to refer to system components and modes of operation.

Bridging Clip – A small metal clip used in a Punch-down Block to short the left-hand columns to the right hand columns of punch-down terminals.

Collector – This device gathers the tracking data from as many as 24 Sensors, processes it as required, and sends it via the 2-pair collecting network to the Ethernet Concentrator. Each system must contain at least one Collector, and many systems will contain more than one.

Ethernet Concentrator – This device provides an interface between the 2-pair network that connects Collectors together (the "Collector Network") and the computer system. It assembles the data from the various Collectors and bundles it for delivery to the host computer. Each system must contain at least one Ethernet Concentrator, and some systems will contain only one.

Impedance – A measure of a characteristic of wire that is very important when digital data signals are to be sent over the wires at high speeds. All wires have impedance determined by their makeup and twisting called the "characteristic impedance" of the wire. Most solid twisted pair wire is about 100 ohms impedance, and the coaxial cables used are 50, 75, or 93 ohms.

Sensor – A device that gathers infrared (IR) light or radio frequency (RF) energy and converts it to an electrical signal, which is then sent over a single pair of wires to a Collector.

Sensor Connection – A single-pair cable that connects a Sensor to a Collector port. All of the Sensor connections in a system may be referred to as the "Sensory Network."

Plenum – Any area that serves as a duct or passage for breathable air. Many office buildings use the space above the suspended ceiling as a return air "plenum" for the heating and air conditioning systems. Most laws require any cables that run in an air plenum to be made of materials which will not burn, or which will not release toxic gases when burned.

Punch-down Block – This device is used to connect Sensor wires to the Collector in an organized fashion. A special tool is used to "punch" the wire onto the Punch-down Block terminals, which causes the terminals to penetrate the wire insulation and cut off excess wire in one easy step. Punch-down Blocks are the preferred method of connection for solid wire in telephone systems.

RJ – Acronym for Registered Jack. Versus uses some modular-style connectors identified by their 'RJ' designations. RJ-11 is a generic term, often used to refer to a six-position jack, though it specifically refers to a single-pair connection in a six-position shell. RJ-12 refers to a two-pair connection in a six-pair shell, and RJ-25 refers to a three-pair connection in a six-pair shell.

Shielded Wire – A type of wire wrapped in a braided or foil shield that protects it from electrical interference. Use of shielded wire may be the only solution in a very high-noise environment.

STP – Acronym for Shielded Twisted Pair. This is wiring usually used in audio system installations where electrical interference is a prime concern (see **Shielded Wire**).

Twisted Pair – The wire used to interconnect Sensors, Collectors, and interfaces is twisted into pairs to make the wire characteristics more uniform and to cancel out many types of interference to which the wires might be subjected (see **UTP**).

USOC – Acronym for Universal Service Ordering Codes. The connectors and wiring adhere to the USOC wiring practices standard wherever possible.

UTP – Acronym for Unshielded Twisted Pair. This is the typical solid, paired wire used in phone system installations. It has no outer shield layer (see **Twisted Pair**).

2.   System Description

The Versus Information System is a reliable, flexible platform for locating people and equipment indoors. The system badges, worn by people or attached to assets, emit infrared (IR) or a combination of infrared and radio frequency (RF) signals that contain information about the badge. The information is sent through the sensory network to a host computer that retrieves the information and translates the data into names of rooms, people, and equipment. Workstations on a LAN throughout the facility can access the location data with various client software programs, which display the current locations of people and equipment. In addition, the system can display alarms on the monitor, send pager messages, and store data for later use in reports.

A.   Infrared (IR) Tracking

The use of infrared (IR) signals for tracking has distinct advantages, since it allows accurate locating via signals that will not penetrate walls or floors. A system of strategically placed IR Sensors receives IR signals as badges move between rooms or areas of a building.

B.   Radio Frequency (RF) Signals

In addition to the IR signal, a low-power radio frequency (RF) signal is incorporated into some badges. RF signals penetrate walls and ceilings, allowing the RF signal to act as a backup if the IR signal is blocked. If the IR signal is blocked and an RF Sensor receives the RF signal, the last known IR location of the badge continues to display. In addition, the RF signal can be used in a supervisory capacity to indicate a low-battery status or button press information, and can trigger the Versus system to activate a pre-programmed response. RF badges and Sensors can also be used for other purposes.

3.   Versus Hardware Parts List

The chart below lists all current available Versus hardware components and their part numbers.

Part Number	Description
VER-0005	(IR) Badge Tester
VER-188x	Mini Asset Tag (black square)
VER-192x	Flex Badge (green circle)
VER-195x / -G /-B /-R /-Y	Clearview™ Badge (clear case) *default color is white; use a dash and letter to indicate **G**reen, **B**lue, **R**ed or **Y**ellow
VER-197x	Asset Tag (black rectangle)
VER-2037	V-Direct Ethernet Concentrator Plus (V7)
VER-2407	V-Direct Collector (V7)
VER-3050	Ethernet DCC Module
VER-352x	Event Tag
VER-4080 / -G /-Y	Remote Station (button) *default color is red; use a dash and letter to indicate **G**reen or **Y**ellow
VER-4085 / -G /-Y	Remote Station (pull cord) *default color is red; use a dash and letter to indicate **G**reen or **Y**ellow
VER-4090 / -G /-Y	Remote Station (1/4" jack) *default color is red; use a dash and letter to indicate **G**reen or **Y**ellow
VER-4432	V-Direct IR XL Standard Sensor
VER-4445-W	V-Direct Badge Storage Cabinet (in **W**hite)
VER-4446	V-Direct Patient Badge Drop Box
VER-4452	V-Direct RF Sensor
VER-5610	V-Link Link Module
VER-5621	V-Link Wireless Sensor
VER-5640	V-Link Badge Storage Cabinet
VER-5645 / -W	V-Link Patient Badge Drop Box *default color is oak; use a dash and letter to indicate **W**hite
VER-6010 / -1 /-25	CR2477 – 3.0V Lithium Coin Cell Batteries * use a dash and numbers to indicate **1** single pack or **25** pack
VER-6015 / -1 /-25	CR2450 – 3.0V Lithium Coin Cell Batteries *use a dash and numbers to indicate **1** single pack or **25** pack

VER-6018 / -1 /-20	CR3032 – 3.0V Lithium Coin Cell Batteries * use a dash and numbers to indicate **1** single pack or **20** pack
VER-6035-1	3.6V Lithium AA Battery
VER-6092	Sensor Focus Kit
VER-6800	Clearview Badge Opening Tool

4.   Versus Hardware Component Overview

For a complete list of available Versus hardware products and their part numbers, refer to Section 3: Versus Hardware Parts List. Also refer to the individual marketing Hardware Specification Sheets for more information about each component.

A.   Signaling Devices and Supplies

Personnel badges are worn by people, asset tags are attached to equipment and Remote Station are affixed to walls. Badges can incorporate IR, RF or both IR and RF technology and are selected according to the needs of the facility. Personnel badges and asset tags emit infrared (IR) and/or radio frequency (RF) signals. The signals contain encoded digital information that is used to identify the badges and report on location and status. Motion, timing, battery state and auxiliary information are all included in the badge signal.

1.   Personnel Badges

a)   IR/RF Clearview Badge (VER-195x)

In addition to sending IR signals, IR/RF combination badges have the added feature of sending radio frequency signals that are received by RF Sensors. RF signals are used in a supervisory capacity in cases when IR signals are obstructed from view. RF is also responsible for sending alarms and call signals triggered by badge button presses.

The Clearview Badge utilizes both IR and RF technologies. The badge is equipped with a call/alert button that, when pressed, transmits IR and RF signals. These signals can be used to notify the system to activate a customizable, pre-programmed response.

- Battery Type – 3.0 V lithium coin cell (industry type CR2477 1000 mAH)
- RF Frequency – 433.92 MHz
- IR Wavelength – 875 nanometers, 447.5 KHz

- IR Transmission Rate – approximately every 3 seconds while in motion, approximately every 2 minutes while in sleep mode
- RF Transmission Rate – 5 rapid transmissions immediately upon button press or approximately once every 2 minutes in supervisory mode

XL Clearview Badges can be distinguished from standard, non-XL Clearview Badges by the product number printed on the back of the badge (e.g. VER-1952 denotes an XL Clearview Badge).

b)   IR/RF Flex Badge (VER-192x)

The Flex Badge uses IR and RF technologies. Like the Personal Alert Badge, it is also equipped with a call/alert button that, when pressed, sends IR and RF signals, which can notify the system to activate a customizable response.

The Flex Badge ships with a hook and loop band, allowing it to be worn like a wrist watch or suspended from a standard bulldog clip.

- Battery Type – 3.0 V lithium coin cell (industry type CR3032 lithium 500 mAH)
- RF Frequency – 433.9 MHz
- IR Wavelength – 875 nanometers

2.   Asset Tags

a)   IR/RF Asset Tag (VER-197x)

The Asset Tag utilizes both IR and RF technologies. Asset tags are used to identify the current location of portable assets.

- Battery Type – 3.0 V lithium coin cell (industry type CR2477   1000 mAH)
- RF Frequency – 433.92 MHz
- IR Wavelength – 875 nanometers, 447.5 KHz
- IR Transmission Rate – approximately every 3 seconds while in motion, approximately every 2 minutes while in sleep mode
- RF Transmission Rate – approximately every 2 minutes

> ⚠️ **METAL AFFECTS RF FUNCTION**
>
> The Asset Tag's RF functions may be limited if the tag is affixed to metal—Versus recommends that the tag be used on non-metal surfaces or with a plastic bracket.

b) IR/RF Mini Asset Tag (VER-188x)

Like the Asset Tag, the Mini Asset Tag uses IR and RF technologies to identify the current location of portable assets. The smaller size of this tag make it suitable for smaller surface mounts.

- Battery Type – 3.0 V lithium coin cell (industry type CR2477 lithium 950 mAH)
- RF Frequency – 433.9 MHz
- IR Wavelength – 875 nanometers

> ⚠️ **METAL AFFECTS RF FUNCTION**
>
> The Mini Asset Tag's RF functions may be limited if the tag is affixed to metal—Versus recommends that the tag be used on non-metal surfaces or with a plastic bracket.

3. Event Tag (VER-352x)

The Event Tag monitors for an activity and notifies the Versus system that a specific event has been initiated at that tag location. Activity is determined via dry-contact closure from the on-board motion detector, external switch source and/or passive infrared motion detected in the vicinity of the tag. Upon detecting such an event, the Event Tag scans the immediate vicinity for a Versus RTLS Badge or Tag and, if detected, relays the identity of the badge tied to the initial event, as follows:

- A dry-contact closure (DCC) switch activity (e.g., reed switch open on crash cart)
- A motion switch activity (e.g., motion detection of fixed supply cabinet door opening)
- A passive IR detector (e.g., hand movement under a dispenser)

When such an event is detected, the Event Tag relays the event information to the Versus system. Additionally, upon detecting an event, the Event Tag scans the immediate vicinity for a Versus RTLS Badge or Tag and, if detected, relays

the identity of the badge tied to the initial event. The scan will last for under five seconds or until a badge or tag is identified.

- Battery Type – one (1) AA 3.6V Lithium 2400 mAh
- RF Frequency – 433.9 MHz
- IR Wavelength – 875 nanometers

4. Additional Signaling Device Supplies

a) Clearview Badge Opening Tool (VER-6800)

The optional Clearview Badge Opening Tool was specifically designed to make Clearview Badge and Asset Tag battery changes quick and easy. The separator blades fit snugly and firmly into the slots on the right and left sides of the badge case.

Gently squeezing the handles spreads the blades slightly, loosening the badge's snug, water-resistant seal. The Clearview Badge Opening Tool is constructed of durable stainless steel and is fully autoclavable.

b) IR Badge Tester (VER-0005)

The IR Badge Tester can be used to check the badge battery state and also to display auxiliary information transmitted by the badge. It will verify that a valid IR packet is received and indicate whether the badge incorporates XL technology. If a valid IR packet is received, the tester displays all badge details and the LED in the upper left corner flashes.

The current version features the Versus logo and lists the following badge information: the badge number, mode (XL/non-XL), Packet Sequence Number (T-count), button press state(s), motion state and battery voltage state.

> **!** **BADGE TESTER ONLY TESTS IR SIGNAL CAPABILITY**
>
> The Badge Tester only tests IR signal capability and battery status; it is not designed to test RF function.

B.   V-Direct™ Sensory Network

The Versus software reacts according to the badge and tag information it receives from the Versus hardware and sensory network. The hardware drives the data input and every software decision. For that reason, the success of a Versus system relies intrinsically on the accuracy of the sensory network. Versus insists on the highest level of accuracy in the sensory layout and installation because it is the foundation for functional results and useful software data.

1.   V-Direct Sensors

Sensors receive signals from badges, convert them into electrical signals and pass the data along to Collectors. Up to 24 Sensors can be connected to a Collector, although Versus recommends no more than 20-22 initially to allow for future expansion. Sensors are usually mounted in the ceiling tiles of a facility, or they can be placed in standard electrical junction boxes where required by local building codes.

a) V-Direct Infrared (IR) Sensors

Infrared Sensors receive IR signals from badges and convert them into electrical signals. A single unshielded twisted-pair wire transmits the signals to a Collector and provides the Sensor's operating power.

IR Sensors have 360-degree horizontal coverage, 180-degree vertical coverage and reliably detect IR signals from a distance of approximately 15 feet.

A Focus Ring and optional Focus Disks (sold separately) can be installed under the IR Sensor's clear protective cover to reduce its pickup range to a smaller area. This method can be useful in rooms with multiple patient beds or for pinpoint desk-to-desk coverage at a nurses' station.

(1) IR XL Standard Sensor (VER-4432)

The VER-4432 infrared XL Standard Sensor is specifically designed for use with the XL family of badges and tags, yet it is fully backward compatible with existing installations. As a Supervised Sensor, the IR XL Standard Sensor allows the Versus system to monitor data delivery to DHCP-capable Collectors by generating its own simulated supervisory badge signal (badge #103). The system can be configured to send an alert if a portion of the sensory network or facility intranet stops sending badge data; this requires the use of additional software.

IR XL Sensors can be identified by their green Activity Indicator LED that lights when an IR signal is received and goes out when the Sensor reports data to the Collector. Since this process often happens very rapidly, the light can appear to blink or flash. The Activity Indicator Light can also serve as a useful troubleshooting tool. The VER-4432 IR XL Standard Sensor can be distinguished from the VER-4430 IR XL Sensor by the single diode mounted under the unit's clear protective cover.

(2) Badge Storage Cabinet (VER-4445-W)

The Badge Storage Cabinet provides a controlled environment in which to store badges when they are not in use. Proper badge storage practices preserve battery life, mitigate badge loss and assist in maintaining an accurate reflection of badge location. Badge Storage Cabinets are designed to accommodate up to 42 badges. They feature a neutral white exterior finish.

Each cabinet contains an internal IR XL Sensor. The Sensor can be configured to prevent badges that are in the cabinet from displaying on Floorplan Views or List Views or to indicate those badges as "out of the area."

(3)　　Patient Badge Drop Box (VER-4446)

Patient Badge Drop Boxes serve as convenient drop-off locations for Versus badges when the patients to which the badges are assigned are discharged. An internal IR XL Sensor reads the IDs of badges inserted through a slot on the front of the unit and sends real-time updates to the system.

When used in combination with specific business rules, the Patient Badge Drop Box automates many aspects of the patient visit cycle, including removal of patient badge assignments at the conclusion of the visit, automated discharge messages and logging clinical milestones. The unit ships with two receiving bins which facilitate the transport of badges from distributed collection locations.

b) *V-Direct Radio Frequency (RF) Sensors (VER-4452)*

Radio Frequency (RF) Sensors operate at 433.92 MHz receive frequency. The Sensors convert encoded RF signals emitted by badges into electrical signals and transmit them to Collectors via a single unshielded, twisted-pair wire.

Planning the location of RF Sensors depends upon the layout or the facility. In most cases, for complete coverage, RF Sensors can be placed approximately 100 feet apart, because they have a sensitivity range radius of approximately 50 feet. However, since concrete and steel may absorb the RF signals and other materials may also affect the strength of RF signals, testing is necessary to determine the best placement of RF Sensors.

Badge signals received by VER-4452 RF Sensors are used to notify the Versus system of badge button presses, Remote Station button presses and badge battery status. RF also acts in a supervisory capacity, prompting the system to continue to display the last known IR location of badges that are not currently being detected by IR sensors.

!   *IR AND RF WORK TOGETHER*

For a real-time healthcare locating system to be truly useful and beneficial, the system must provide precise, reliable location data. Workflow decisions and vital actions should not be based on the imprecise data received from RF-only locating systems.

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2. V-Direct Collectors (VER-2407)

After Sensors receive signals from badges and convert them to electrical signals, the data is passed to a Collector. The Collector accepts the input from the Sensors and assembles the data into larger, network-ready packets. The packets are then relayed to the Ethernet Concentrators.

A punch-down connector block is included with each Collector. The connector block plugs directly into the 50-pin Amphenol connector on the side of the Collector. Up to 4 Collectors, including the internal Collector within the VER-2037 Concentrator, can be connected from one to another in a daisy-chain configuration.

The 24V power supply for the Collector is also included, as well as a specialized cable and mounting supplies.

ALLOW ROOM FOR EXPANSION

The Versus Collector can support up to 24 Sensors. However, best practices suggest leaving open wire pairs (open positions) on the Collector punch-down block to allow for easy addition of extra Sensors or Badge Storage Cabinets.

No more than 20 - 22 Sensors should be connected during the initial installation to allow for future expansion without additional Collectors.

The current VER-2407 Collector features a black plastic casing and new design which provides the added flexibility of allowing the unit to be upgraded to an Ethernet Concentrator in the future. They are fully compatible with the DHCP generation of Collectors and Ethernet Concentrators and can be mixed or matched on existing DHCP hardware chains.

3. **V-Direct Ethernet Concentrators (VER-2037)**

Ethernet Concentrators are network devices that receive all data passed from Sensors through Collectors, format the data and send it as a data packet to a computer over a LAN.

Each Ethernet Concentrator is assigned an IP address, which is how the data is communicated to the V-Direct Locating Driver. By default, each VER-2037 Concentrator ships with IP address **208.6.140.104**.

Each Ethernet Concentrator can support up to four Collectors, including the Concentrator Plus' internal Collector.

CONCENTRATOR PLUS INCLUDES COLLECTOR

The VER-2037 Concentrator Plus differs from earlier models because it includes one internal Collector, which functions as the first Collector on its chain. Each Concentrator Plus connects to a punch-down block.

Therefore, the shortest chains in any installation will consist of only one (1) Concentrator Plus and no (0) Collectors. When serving as the only Collector in a chain, the Concentrator Plus should be terminated just as you would a Collector with the included termination shunt. Longer chains will include up to three (3) additional Collectors connected to the Concentrator Plus.

A CD containing the current shipping version of the Versus V-Direct Locating Driver software and the accompanying user manual in .PDF format is included with each Ethernet Concentrator. The 24V power supply for the Ethernet Concentrator and mounting supplies for the device are included.

C.   V-Link™ Sensory Network

The new V-Link™ platform uses the same accurate IR-RFID technology as the V-Direct system, but communicates location information wirelessly—without burdening the facility Wi-Fi network. V-Link components are installed once and require very little ongoing maintenance. A facility may choose the hardware platform based on need and mix-and-match using the same Versus badges and tags.

The Versus V-Link Gateway collects RTLS location data sent by the Link Modules, via a proprietary radio frequency (RF) wireless protocol, then aggregates location data before sending it via Ethernet to Versus software. The unit receives data via an internal RF antenna. A connection for an external antenna is also provided. The Gateway communicates over a two-way wireless RF channel in the 2.4GHz spectrum, secured by an encryption algorithm. The proprietary, patented V-Link communication protocol is designed to coexist with other networks and will not interfere with existing IEEE 802.1x signals (e.g., Wi-Fi, ZigBee).

1. Badges and Tags:
Badges worn by people and tags attached to equipment emit infrared (IR) and radio frequency (RF) signals. The Remote Station, a wireless wall-mounted device, emits an RF signal when activated. V-Link 2.0 is compatible with standard Versus badges, tags and Remote Stations.

VER-1952 Clearview™ Badge (IR/RF)

VER-1972 Asset Tag (IR/RF)

VER-1882 Asset Tag (IR/RF)

VER-40XX Remote Station (RF)

433 MHz RF

447.5 kHz IR

2. Wireless Sensors:
Strategically placed sensors, powered by D-cell batteries, receive IR signals from badges and transmit location data to the nearest Link Module.

VER-5621 Sensor

2.4 GHz RF

VER-5610 Link Module

3. Link Module:
Plugged into common electrical outlets, Link Modules receive location data from sensors, as well as signals from Remote Stations and overall health information from badges (battery status, etc.). Link Modules communicate data to a Gateway. Two-way communication between the Sensor, Link and Gateway is used during system configuration.

2.4 GHz RF

4. Gateway:
The primary communicator from the sensory network to the software platform, the Gateway provides two-way communication to the configured Link Modules within its range.

VER-5500 Gateway

Ethernet Connection

Location Data

Large Screen Monitors, Workstations, and Mobile Devices on Facility Intranet

Versus Application Server

1.   V-Link Sensors (VER-5621)

The V-Link Sensor receives IR signals from all standard Versus personnel badges and asset tags. Both eXtended life (XL) and non-XL badge technology is supported.

The Sensor converts the IR signal information and communicates it to the Link Module over a wireless RF channel in the 2.4GHz spectrum, secured by an encryption algorithm. The proprietary, patented V-Link communication protocol is designed to co-exist with other networks and will not interfere with existing IEEE 802.1x signals (i.e. Wi-Fi, ZigBee).

The V-Link Sensor is the Infrared (IR) location element of the V-Link Sensory Network, and is installed in all areas where locating coverage is needed. Entirely wireless, battery-operated and easily-mounted, the Sensor receives IR signals from Versus badges and tags. Using patented, radio frequency (RF) signaling technology, the Sensor sends location data to the Links.

The current V-Link Sensor receives IR signals from standard badges and asset tags to establish the badge/tag location. The Sensor has a standard 15-foot pickup radius.

The attached mounting plate is designed to be screwed directly into a hard ceiling surface. Alternatively, it can be mounted easily and securely to a suspended ceiling grid with the included Grid Clip. The inconspicuous white housing blends into the ceiling tile. Consider the weight of the unit with batteries as well as the physical environment and building requirements when choosing an installation mechanism.

2.   V-Link Link Modules (VER-5610)

The Versus Link Module is the primary data conduit for the V-Link sensory network. In addition to acting as an RF sensor, receiving 433 MHz RF signals from Versus badges and tags, the Link wirelessly receives RTLS data from the V-Link Sensors and sends the data to Gateway devices via the 2.4 GHz RF platform. The Link has a standard pickup radius of 35 feet, and is subject to RF attenuation.

The Link has two important jobs within the V-Link sensory network and gathers two types of sensory information:

- 433 MHz RF signals from Versus badges and tags
- 2.4 GHz RF signals from V-Link Sensors

The Link combines both sets of information into a data packet that it transmits via the 2.4 GHz RF signal to the V-Link Gateway. The Links communicate over a two-way wireless RF channel in the 2.4GHz spectrum, secured by an encryption algorithm. The proprietary, patented V-Link communication protocol is designed to co-exist with other networks and will not interfere with existing IEEE 802.1x signals (i.e. Wi- Fi, ZigBee).

A relatively small number of Link devices is required. They are easily installed by plugging directly into AC wall receptacles. They are anchored to the receptacle with an anti-tamper T-10 security screw that is included. The Link can be installed in accessible areas of the facility, or mounted above suspended ceilings.

CAUTION WHEN INSTALLING LINK DEVICES

Use caution when installing Link devices by plugging directly into AC wall receptacles, as follows:

a) Risk of Electric Shock – Disconnect power to the receptacle before installing or removing the unit. When removing the receptacle cover screw, the cover may fall across plug pins or receptacle may become displaced.

b) Use only with a duplex receptacle having a center screw.

c) Secure unit in place by receptacle cover screw.

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3.   V-Link Gateways (VER-5500)

The Gateway is an Ethernet-based device that decodes and validates information from up to 100 locations. It aggregates the location data before sending it via Ethernet to the Versus software.

The Gateway operates within the 2.4GHz spectrum, receiving data from the Links via an internal RF antenna. A connection for an external antenna is also provided. In general, the Gateway has a 50-foot pickup radius that may be subject to RF attenuation.

The Gateway communicates over a two-way wireless RF channel in the 2.4GHz spectrum, secured by an encryption algorithm. The proprietary, patented V-Link communication protocol is designed to co-exist with other networks and will not interfere with existing IEEE 802.1x signals (i.e. Wi-Fi, ZigBee).

V-Link Gateways typically use Ethernet (POE) to receive power, in parallel to data, over the facility's existing CAT-5 Ethernet infrastructure. This configuration requires PoE 44-57 VDC 350ma over unshielded twisted-pair wiring. Alternatively, the Gateway may be powered via the included standard 6 VDC power supply.