



# Zebra Wireless Insights Agent

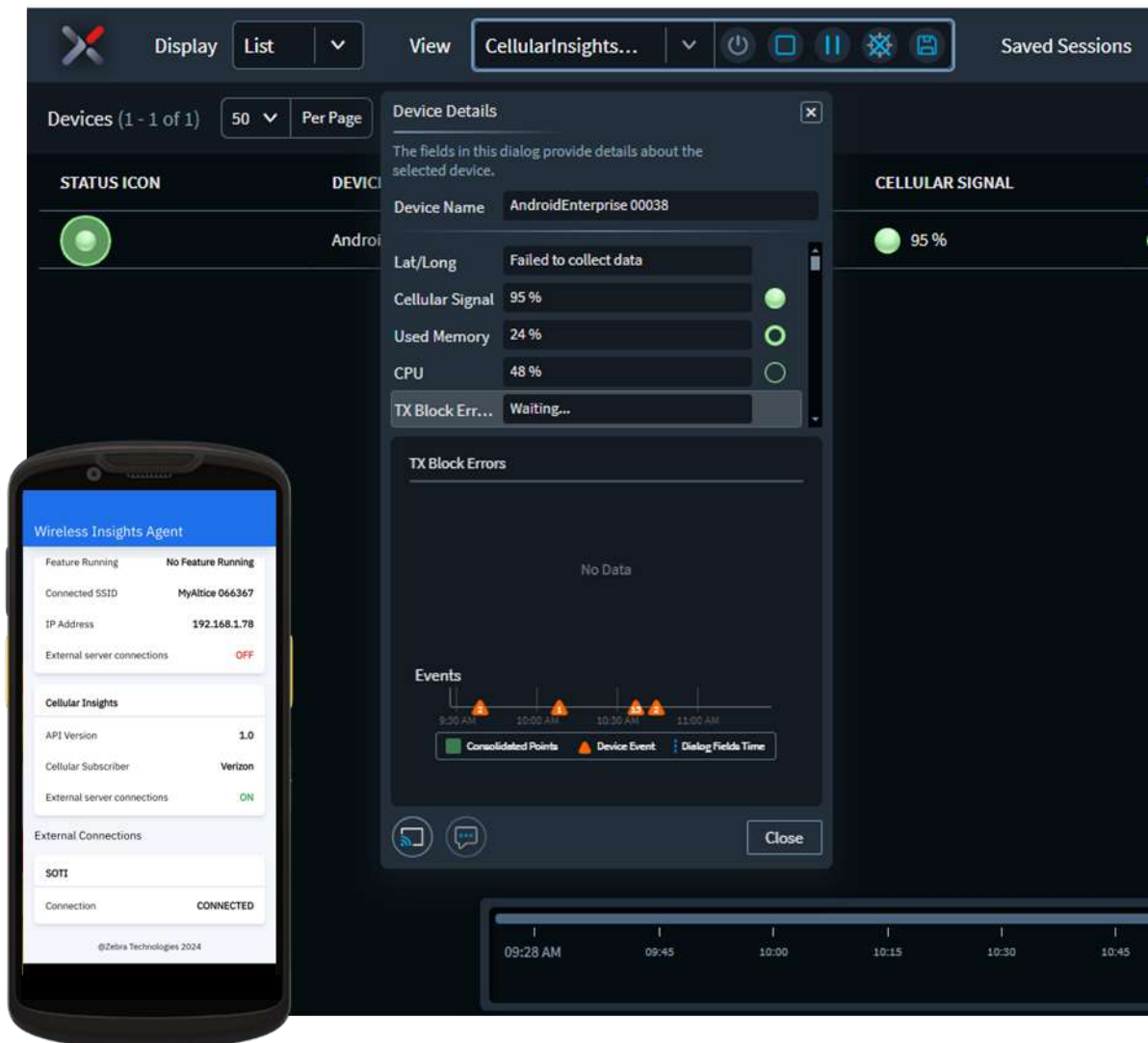
Version 1.04

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# 1 Introduction

Wireless Insights Agent is an analytical feature from Zebra Technologies for its devices. It provides you a deeper understanding of the performance, behavior, and characteristics of your mobile Zebra device with information on cellular connectivity.



## 2 Solution Enablement

### 2.1 Wireless Insights Operating System Support

Wireless Insights is supported on select zebra devices that include its Service with the BSP Software from the factory image. Please see list of supported devices and minimum required SW versions below.



**TC53/TC58**



**TC73/TC78**



**ET60/ET65**



Available on Android 13 starting with AT\_FULL\_UPDATE\_13-29-20.00-TG-U00



**TC27\***

Available on Android 13 starting with AT\_FULL\_UPDATE\_13-29-20.00-TG-U00-H01-ATH-04. \*Also requires Mobility DNA Upgrade license



**ET40/45\*\***

Available on Android 13 starting with GO\_FULL\_UPDATE\_13-30-18.00-TG-U00-H01-GSE-04. \*Also requires Mobility DNA Upgrade license

## 2.2 Wireless Insights Agent

Wireless Insights Agent may not come with your Zebra device software out of the factory and would be required to be staged or installed. The Agent shall be installed on the device from SOTI Marketplace and shall be deployed using SOTI MobiControl.

## 2.3 License

### 2.3.1 Trial

The Wireless Insights Agent comes with 12 months of Trial. Trial is activated (the clock starts) once the Wireless Insights Agent is installed. The Trial 'end' automatically with the License installation, and the WI becomes 'Licensed'. If license is not installed after 6 months, there is a specific notification 'reminder' event sent daily to indicate the expiry date of the Trial. At the end of the Trial Date (if WI not licensed yet) the WI Agent switches to 'unlicensed' state and stops sending events.

### 2.3.2 Requirements and Procurement of Wireless Insights License

The Wireless Insights License should be procured and installed on the device for the Agent to send the events data to the cloud. Please refer [here](#) for information on how to procure Wireless Insights license.

## 3 Cellular Insights Data

Wireless Insights provides visibility to device analytics regarding the Cellular Technology, Voice call data, IP Performance data, Handoff data and throughout related data of the connectivity the device is experiencing.

### 3.1 Event Information.

The events contain the following information. We suggest sampling frequency of 5 seconds to ensure all events are captured.

#### 3.1.1 Global information in events, such as:

- Wireless Insights version
- Device Serial Number
- Device model
- BSP Version
- Agent Version

- Group id or enrollment id
- Wireless Insights technology (Cellular)
- Timestamp.

### 3.1.2 Event-specific information, such as:

- Event Type and Timestamp
- Subscription related info: Operator name, MCC, MNC, Phone Number, ICCID, EID if applicable, MBN info.
- Coverage's Basic info: Serving Cell info like RAT type, RSSI, RSRQ, RSRP, Signal level, bands, tracking area code and Neighboring Cell information
- Service state related Info: Service State (In Service, Out of Service), Roaming Indicator, Mobile Data Network type
- IMS related Info: IMS State, VOPS support
- IP Network Info: IP Address, DNS address, Gateway address
- Network Registration failures related Info: Registration failure reasons
- Voice call failures related Info: Voice call error codes and error reason
- Data Throughput related info: Rx block errors, Tx block errors
- IP Performance related Info: Rx Packet errors, Tx Packet errors
- Transport type related info to analyze Handoff related failures
- Location Info: Latitude, Longitude, speed, altitude
- Device Info: IMEI, build details, Modem version, QCN info, MBN info

## 3.2 Cellular data elements

Name	Data Type	Units	Field Key	Description	Significant Change
Type	String		\$.cellData[0].SS.SCSS.type	Indicates what Radio Access Technology the signal strength has been reported	N/A
rsi	Int	dBm	\$.cellData[0].SS.SCSS.rssi	Received Signal Strength Indication (RSSI) value will range from -133 to -51.	5
rsrp	Int	dBm	\$.cellData[0].SS.SCSS.rsrp	Reference signal received power value will range from -140 to -43.	0
rsrq	Int	dBm	\$.cellData[0].SS.SCSS.rsrq	Reference signal received quality. This value will range from -20 to -3.	5
rssnr	Int	dBm	\$.cellData[0].SS.SCSS.rssnr	Reference signal signal-to-noise ratio, value will range from -20 to +30.	5
dbm	Int		\$.cellData[0].SS.SCSS.dbm	Serving Cell Signal Strength. This is same as RSRP, will be removed in next version.	5
TA	Long		\$.cellData[0].SS.SCSS.ta	Serving Cell Signal Strength Timing Advance value which is used to ensure proper synchronization between the mobile device (User Equipment, UE) and the network. This value is between 0 and 1282	N/A
Tac	String		\$.cellData[0].CI.SCI.tac	Tracking Area Code. The TAC is part of the Tracking Area Identity (TAI). It is a 16-bit integer. It is used to indicate eNodeB to which Tracking Area the eNodeB belongs	N/A

				(per Cell). It is unique within a PLMN. This value is between 0 and 65535	
Lac	String		\$.cellData[0].CI.SCI.lac	The Location Area Code (LAC) is a unique identifier assigned to a location area within a cellular network. This value is between 0 and 65535	N/A
Ci	String		\$.cellData[0].CI.SCI.ci	Cell identity, Unique identifier for a cell within a location area in GSM networks. Helps identify the specific cell a device is connected to for troubleshooting location-specific issues. This value is between 0 and 268435455	N/A
Pci	String		\$.cellData[0].CI.SCI.pci	Physical Cell ID (PCI) is a unique identifier that identifies a cell in 4G LTE and 5G NR networks. Useful for distinguishing between cells in the same area to diagnose handover and interference problems. For LTE, this value is between 0 and 503. For NR, this value is between 0 and 1007	N/A
Earfcn	String		\$.cellData[0].CI.SCI.earfcn	E-UTRA Absolute Radio Frequency Channel Number) is a unique identifier for a radio frequency (RF) channel in the LTE (Long Term Evolution) cellular network. It is used to identify the carrier frequency, bandwidth, and duplex mode of the channel.  Helps pinpoint frequency-specific issues affecting signal quality and performance. This value is between 0 and 262143	N/A
Uarfcn	String		\$.cellData[0].CI.SCI.uarfcn	Identifier for the frequency channel in UMTS. Assists in analyzing UMTS network problems related to specific frequency channels. This value is between 0 and 16383	N/A
Cid	String		\$.cellData[0].CI.SCI.cid	Unique identifier for a specific cell in the network (UMTS). Essential for tracking and resolving issues related to a particular cell. This value is between 0 and 65535	N/A
Arfcn	String		\$.cellData[0].CI.SCI.arfcn	Serving Cell frequency channel number (GSM). Useful for diagnosing frequency-specific interference and connectivity issues. This value is between 0 and 65535	N/A
Psc	String		\$.cellData[0].CI.SCI.psc	UMTS Primary Scrambling Code. Helps identify and resolve issues related to cell selection and reselection in UMTS networks. This value is between 0 and 511	N/A
Bands	String		\$.cellData[0].CI.SCI.bands	Bands used by the cell. Important for understanding which frequency bands are in use and diagnosing band-specific performance issues.	N/A
BandWidth	String	kHz	\$.cellData[0].CI.SCI.bandwidth	The width of the frequency band used for transmitting data, typically measured in kHz and helps in analyzing throughput issues and determining if bandwidth limitations are causing problems.	N/A
Mcc	String		\$.cellData[0].CI.SCI.mcc	Mobile Country Code. Useful for verifying the correct network configuration for the country the device is operating in.	N/A
Mnc	String		\$.cellData[0].CI.SCI.mnc	Mobile Network Code. Essential for ensuring the device is connecting to the intended network operator.	N/A

AlphaLong	String		\$.cellData[0].CI.SCI.alphaLong	Long-form name of the network operator. Helps confirm the correct network operator is being displayed to the user	N/A
AlphaShort	String		\$.cellData[0].CI.SCI.alphaShort	Short-form name of the network operator. Useful for verifying network operator information in UI elements.	N/A
ServiceState	String		\$.cellData[0].SvS.state	It represents current registration state of the Serving Cell (IN_SERVICE, OUT_OF_SERVICE, EMERGENCY_ONLY, or POWER_OFF). Crucial for diagnosing connectivity issues and understanding the service status of the device.	N/A
RAT	String		\$.cellData[0].SvS.rat	It represents which Radio Access Technology device is operating on like NR, LTE, GSM. Helps determine which technology is in use and if it's appropriate for the device's current location and conditions.	N/A
RI	String		\$.cellData[0].SvS.ri	To identify whether Data or Voice registration is in Roving state or not.	N/A
Mobile_Data_NetworkType	String		\$.cellData[0].SvS.mobileDataNetworkType	This identifies the Mobile data Network registration type i.e. LTE or eHPRD (Enhanced High-Rate Packet Data). Useful for understanding the data connection type and diagnosing speed or connectivity issues.	N/A
Operator Numeric	String		\$.cellData[0].SvS.operatorNumeric	Numeric code representing the network operator (MCC + MNC). Ensures the device is correctly identifying and connecting to the intended network.	N/A
PLMN	String		\$.cellData[0].SvS.plmn	It represents Network Operator Name such as T Mobile, Verizon, and AT&T.	N/A
Data_CauseCode	String		\$.cellData[0].IPeR.causeCode	It will identify error code for data connection failure.	N/A
Data_ErrorReason	String		\$.cellData[0].IPeR.errorReason	It will identify the error description for the data connection failure.	N/A
Acquisition_Data_CauseCode	String		\$.cellData[0].CEr.causeCode	Cell ERROR Cause Code. Useful for diagnosing issues with network acquisition and registration.	N/A
Acquisition_Data_ErrorReason	String		\$.cellData[0].CEr.errorReason	Cell ERROR Reason description	N/A
TotalRxBlocks	Int		\$.cellData[0].CERTx.totalTxBlocks	Total Blocks Received. Which will be helpful in identifying block errors from Modem	0
RxBlockErrors	String		\$.cellData[0].CERRx.rxBlockErrors	Number of ERROR Blocks Received. Helps in identifying the block error rate from Modem	N/A
TotalTxBlocks	Int		\$.cellData[0].CERRx.totalRxBlocks	Total Blocks Transmitted. Helps in identifying transmitted block errors from Modem	0
TxBLOCKErrors	String		\$.cellData[0].CERTx.txBlockErrors	Number of ERROR Blocks Transmitted. Helps in identifying the block error rate from Modem	N/A
RxPackets	Int		\$.cellData[0].IP.rxPackets	Total Packets Received	0
RxPacketErrors	Int		\$.cellData[0].IP.rxPacketErrors	Number of Error Packets Received	0
TxPackets	Int		\$.cellData[0].IP.txPackets	Total Packets Transmitted	0
TxPacketErrors	Int		\$.cellData[0].IP.txPacketErrors	Number of Error Packets Transmitted	0



TotalRxBytes	Int		\$.cellData[0].IP.totalRxBytes	Total number of Bytes Received	0
TotalTxBytes	Int		\$.cellData[0].IP.totalTxBytes	Total number of Bytes Transmitted	0
IPAddresses	String		\$.cellData[0].IPNw.ipAddresses	List of IP addresses assigned to the device. Helps in network configuration and identifying connectivity issues related to IP addressing.	N/A
DNSAddresses	String		\$.cellData[0].IPNw.dnsAddresses	List of DNS server addresses used. Useful for troubleshooting DNS resolution issues	N/A
GatewayAddresses	String		\$.cellData[0].IPNw.gatewayAddresses	List of gateway addresses for routing traffic. Important for diagnosing routing and connectivity problems.	N/A
DNSLookup	String	Ms	\$.cellData[0].NwL.dnsLookup	Time taken to resolve a DNS query. Helps identify delays and issues in DNS resolution.	N/A
ServerLatency	float	Ms	\$.cellData[0].NwL.serverLatency	This identifies the delay between a browser sending a request to a server and the server processing it.	N/A
LocationProvider	String		\$.cellData[0].LOC.locationProvider	Location provider used to fetch the current location like GPS, FUSED, and NETWORK. Helps determine the source of location data and troubleshoot location-related issues.	N/A
Lat	Float	Deg.	\$.cellData[0].LOC.lat	Geographic coordinate indicating north-south position. Important for verifying the device's location and troubleshooting location-based services. This value is between -90° to 90°	N/A
Lon	Float	Deg.	\$.cellData[0].LOC.lon	Geographic coordinate indicating east-west position. Useful for confirming the device's exact location. This value is between -90° to 90°	N/A
Speed	Float	KM/H	\$.cellData[0].LOC.speed	Current speed of the device. Helps in analyzing movement patterns and potential issues related to mobility. This value is between 0 to 515	N/A
Altitude	Float	meters	\$.cellData[0].LOC.altitude	Current altitude of the device above sea level. Useful for location accuracy and troubleshooting GPS data. This value is between 0 to 18,000	N/A
Accuracy	Float		\$.cellData[0].LOC.accuracy	Accuracy of the location information provided. Important for determining the reliability of the location data.	N/A
IMSRegistered	String		\$.cellData[0].IMS.imsRegistered	This is to identify whether IMS is registered or not. Essential for troubleshooting VoLTE and other IMS-based services.	N/A
VOPSSupport	String		\$.cellData[0].IMS.vopsSupport	This is Network Information element to identify whether it supports Voice over PS	N/A
ErrorType	String		\$.cellData[0].ClEr.errorType	Call Error Type. To identify the errors related to voice call	N/A
ErrorCode	String		\$.cellData[0].ClEr.errorCode	This identifies call failure error code. To map the error with corresponding error	N/A
DeviceName	String		\$.cellData[0].DI.deviceName	The "DeviceName" helps identify the device in use and ensures compatibility with network services.	N/A
SerialNumber	String		\$.cellData[0].DI.serialNumber	The "SerialNumber" is useful for tracking and managing individual devices.	N/A
IMEI1	String		\$.cellData[0].DI.imei1	IMEI1. Essential for device identification and security purposes.	N/A

IMEI2	String		\$.cellData[0].DI.imei2	IMEI2. Essential for device identification and security purposes.	N/A
EID	String		\$.cellData[0].DI.eid	Unique identifier for an eSIM. Helps identify and manage eSIM profiles on the device.	N/A
BuildNumber	String		\$.cellData[0].DI.buildNumber	The build version of the device's firmware or operating system.	N/A
RILVersion	String		\$.cellData[0].DI.rilVersion	Version of the radio interface layer software. Important for diagnosing compatibility and functionality issues between the device's hardware and software.	N/A
ModemVersion	String		\$.cellData[0].DI.modemVersion	ModemVersion is used to identify current modem version loaded on the device. Helps identify issues related to modem firmware and its interaction with the network.	N/A
QCNVersion	String		\$.cellData[0].DI.qcnVersion	QCNVersion is useful for troubleshooting issues related to RF calibration and performance.	N/A
HWMBN	String		\$.cellData[0].DI.hwmbn	HWMBN version is to identify whether proper modem binary loaded as per Model/Device.	N/A
BatteryCharge	Int		\$.cellData[0].DIEx.batteryCharge	BatteryCharge is important for diagnosing power-related issues and ensuring the device has sufficient battery capacity.	10
BatteryRemaining	Int		\$.cellData[0].DIEx.batteryRemaining	BatteryRemaining is important for diagnosing power-related issues and ensuring the device has sufficient battery capacity.	10
BatteryTemp	Float		\$.cellData[0].DIEx.batteryTemp	Current temperature of the battery. Helps identify potential overheating issues and ensure safe battery operation.	N/A
DeviceTemp	Float		\$.cellData[0].DIEx.deviceTemp	Current temperature of the device. Useful for diagnosing overheating issues and ensuring the device operates within safe temperature ranges.	N/A
SI_operatorName	String		\$.cellData[0].SI.operatorName	Name of the mobile network operator. Helps confirm the correct operator is being displayed and connected.	N/A
SI_mcc	Int		\$.cellData[0].SI.mcc	MCC of Subscription. Useful for verifying the correct country code and ensuring proper network configuration.	0
SI_mnc	Int		\$.cellData[0].SI.mnc	MNC of Subscription. Important for confirming the network operator and resolving connectivity issues.	0
SI_imsi	String		\$.cellData[0].SI.imsi	IMSI of Subscription. Essential for identifying and managing subscriber identity on the network.	N/A
SI_mobileNumber	String		\$.cellData[0].SI.mobileNumber	Mobile Number. Useful for verifying the correct phone number and resolving issues related to calling and messaging.	N/A
SI_voiceMail	String		\$.cellData[0].SI.voiceMail	Voicemail number associated with the subscription. Helps ensure proper voicemail configuration and troubleshooting voicemail-related issues.	N/A
SI_iccid	String		\$.cellData[0].SI.iccid	ICCID of Subscription. Essential for identifying the SIM card and resolving issues related to SIM management.	N/A
SI_eid	String		\$.cellData[0].SI.eid	EID will be used to download eSIM profile on the device. Helps to manage and troubleshoot eSIM profiles.	N/A

SI_swMbn	String		\$.cellData[0].SI.swMbn	Software MBN version is to identify whether proper modem binary loaded as per subscription or not.	N/A
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