



Syrus 4G CAT-1 M1-NB2 SMART GATEWAY

One device, multiple applications, infinite possibilities.

COMPATIBLE WITH



POWERED BY



MANAGED BY



Smart Telematics Gateway designed for advanced fleet management applications with extensive capabilities, offering integrations with multiple sensors and accessories, a built-in CAN J1939 interface, and an open-development environment. Powered by APEX Linux OS, capable of hosting third-party applications to meet the most demanding configurations for any business model.

Includes SyrusCloud; a centralized management platform for device remote access, automatic firmware updates, network diagnostics, and remote application management. Includes software development tools for integration into any existing platform via APIs.

Special features include a global LTE Cat M1/NB-IoT modem, low power consumption mode, backup battery, integrated CAN J1939 interface, optional factory built-in e-Sim, optional WiFi/Bluetooth connectivity via USB dongles, powerful GNSS capability, 3-axis powerful accelerometer for measuring driving behavior and vehicle impact.

Its built-in cellular and GNSS antenna together with a water-resistant enclosure and powerful backup battery makes it the ideal solution for fast, easy, and reliable installations.

H A R D W A R E F E A T U R E S



CRYPTO-AUTHENTICATION / ONBOARD SECURE ELEMENT



WIFI / BLUETOOTH*
*CAPABLE VIA USB DONGLES



MULTIPLE INPUT/OUTPUTS
RS-232 & 1-WIRE INTERFACE



INTEGRATED J1939
CAN INTERFACE



SDKS & API
DEVELOPMENT TOOLS



EMBEDDED GNSS & LTE ANTENNAS



REMOTE DEVICE
CLOUD DIAGNOSTICS



MULTI-CONSTELLATION
ENHANCED GNSS





LTE/CAT-M1/CAT-NB2
GLOBAL NETWORK COVERAGE





3-AXIS ACCELEROMETER
WITH GYROSCOPE


KEY FEATURES


-  **Advanced Interactions through SDKs & APIs**


Create and deploy IoT/M2M solutions quickly using the embedded Apex Linux OS software tools. Run applications directly on the device using a suite of APIs & SDKs.
-  **Embedded e-SIM Connectivity**


Enhance connectivity coverage with an embedded e-SIM*. Optional feature per request at manufacturing.
-  **Water Resistant Enclosure**


IP65 enclosure rating allows for complete protection from dust and water jets from all directions. It is ideal for a wide variety of applications such as industrial IoT, fleet management, public sectors, and logistics.
-  **Tire Pressure Monitoring Systems (TPMS)**


Integrated with TPMS sensors that help you keep track of the state of tires by measuring temperature and pressure in real-time.
-  **Engine Diagnostics Monitoring**


Receive engine data by connecting to the vehicle's onboard ECU module to remotely diagnose the health of the vehicle. Get real-time alerts of engine error codes for fleet maintenance and to help reduce vehicle downtime.
-  **Accessory Integrations**


Multiple ports for different sensors and accessories for edge integration from device to cloud. Plug in an accessory and get the digested data for integration into your solutions.
-  **Apex Linux OS Embedded Intelligence**


Custom Linux distribution based on Yocto framework to program and configure the device. Includes an easy-to-understand programming language, Syruslang, capable of fast interaction with device peripherals and accessories.
-  **Blackbox Functionality**


Built-in blackbox functionality to help you see the true impact of a crash. Obtain event data recordings at the time of an incident with high precision accelerometer data that can be downloaded and used to reconstruct an accident.
-  **Extended Storage**

Securely store events or any data on an external USB memory*. Automotive USB receptacle ready, USB Memory Card not included.
-  **Driver System Monitoring - Fatigue**

Compatible with fatigue sensing cameras that help you avoid fatigue-related accidents. Send alerts in real-time as well as in-cabin voice notifications to warn the driver any time he/she yawns or appears drowsy.
-  **Advanced Driver Assistance Systems (ADAS)**

Increase driver safety with advanced cameras that monitor the road with automated technology.
-  **WiFi/Bluetooth Functionality**

Add connected car capabilities to your fleet with onboard WiFi allowing you to connect several wireless devices within the vehicle. Automotive USB receptacle ready, WiFi/Bluetooth dongle not included.
-  **Satellite Connectivity**

Reduce downtime in remote areas with global satellite coverage provided by Iridium™ via an integrated Satcom accessory*. Satcom is sold separately.
-  **Syrus Cloud Device Management**

Centralized Management Platform for device diagnostic and remote access.

TECHNICAL SPECIFICATIONS

PRODUCT INFORMATION

Manufacturer	Digital Communications Technologies
Brand	DCT
Model Description	Syrus 4G Cat-M1/NB-IoT Smart Gateway Syrus 4G Cat-1-IoT Smart Gateway
PART NUMBER / ORDERING CODES	
S4G-CATM1/NB2-M3-SH	With SIM holder
S4G-CATM1/NB2-M3-ES	With e-SIM (embedded SIM)
S4G-CAT1-LA-SH	With SIM holder
S4G-CAT1-LA-ES	With e-SIM (embedded SIM)
S4G-CAT1-EU-SH	With SIM holder
S4G-CAT1-EU-ES	With e-SIM (embedded SIM)

PHYSICAL

Unit Dimensions	107 mm x 77 mm x 27.3 mm
Weight	250 g
Material	Polycarbonate UL94 V0 for higher temperatures
Case Rating	IP-65
LEDs	Red (System) Green (LTE/Connectivity) Yellow (GNSS)

ENVIRONMENTAL

Operating Temperature	-30°C to 85°C
Storage Temperature	-25°C to 40°C
Operating Humidity	Up to 95% non-condensing
Storage Humidity	10% to 90% non-condensing

BACKUP BATTERY

Capacity	1.2 A
Operating Voltage	3.7 V
Technology	Polymer Li-Ion
Weight	6 g
Protection	Internal PCM Circuit
Temperature Ranges	Charge: 0°C to 40°C Discharge: -20°C to 40°C

INTERNAL PCB LAYOUT



POWER SUPPLY PROTECTIONS

Overvoltage	Yes
Over-current	Yes
Max: 1.6 A	
Reverse Polarity	Yes
Internal Resettable Fuse	Yes

14-WIRE CABLE

Cable Length & Specifications	
Total Length	100 cm
Black Jacket Length	56 cm
Expose Cables Length	44 cm
Internal Wire Gauge	UL2464 22AWG
Outputs	
	2 – Open Drain Outputs
	Continuous Current
	Capacity: 1.6A
	Maximum Instantaneous
	Current: (< 1 sec): 10A
	Maximum Switching Voltage:+32V
	Automatic Overvoltage/Over-current
	Resettable Protection
Inputs	
	3 - Discrete Inputs (Ground activated)
	1 - Pulse counter input up to 1KHz
	(one of the 3 inputs can be configured as a pulse counter) from 0V to 32V
	50KΩ Impedance
	1 - Ignition Input. 50KΩ Impedance
	1 - Analog Input (ADC)
	Voltages from 0V to 28V.
	127KΩ Impedance
Data Comm Ports	
	1 – Internal USB Micro-B Connector for programming purposes
	1 – RS232 Serial Port
	1 – CAN 2.0b (supports J1939/ISO11783, ISO15765 & FMS)
	1 – Internal USB Type-A automotive connector for Wi-Fi/Bluetooth/Storage dongles
	1 – One-Wire Bus
Power Supply	
	From 8 – 38VDC. Connect directly to battery positive terminal

ANTENNAS & SIM ACCESS

Cellular 2G/3G/4G-LTE	1 – Embedded
GNSS/GPS/GLONASS/GALILEO	1 – Embedded
SIM Access	Internal (2FF SIM)

TECHNICAL SPECIFICATIONS

CONNECTORS

USB Type-A	1 – Internal automotive connector for Wi-Fi/Bluetooth/Storage dongles
USB Micro-B	1 – Internal connector for programming purposes

e SIM CHIP (Optional)

MFF2 Form Factor	ETSI TS 102.671 + extended JEDEC tests set Quality Process ISO 9001 Classification RoHS, REACH, Halogen-Free
Operating Temperature	-40°C to + 105°C

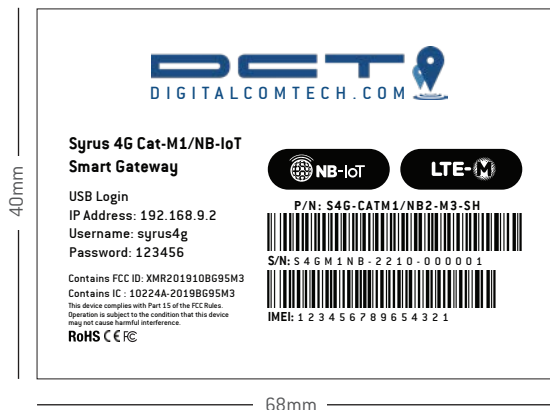
SIM CARD

SIM Holder	Automotive Grade 2FF Form Factor Dual-Point contact design Auto-lock latch prevent card ejection Card detection switch High resistance against impact/temperature & shock
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ELECTRICAL

Operating Voltage	8 - 38VDC
Power Consumption	
Deep Sleep Mode	1mA @ 12V
Active Tracking	70mA @ 12V

DEVICE LABEL *



*Label displayed for item # S4G-CATM1/NB2-M3-SH

MOUNTING

Screw Mount
Tie-Wrap

INTERNAL BUZZER

85dBA Buzzer for audio signals

OPERATING SYSTEM

Processor	Sitara™ ARM® Cortex®-A8 32Bits Processor @ 1GHz
Flash Memory	4GB
RAM Memory	4Gb DDR3
Linux OS Apex Distribution by DCT	

GNSS SPECIFICATIONS

Frequencies [MHz]:	1575.42±1.023
GPS L1	1597.5~1605.8
GLONASS L	1575.42±2.046
BeiDou B1	1561.098±2.046
GNSS Sensitivity:	
Cold Start	-148 dBm
Reacquisition	-161 dBm
Tracking	-166 dBm
TTF:	
Hot start	2 seconds
Warm start	30 seconds
Cold start	35 seconds
Accuracy	<2.5 m
Max Altitude	18,000 m
Velocity	515 m/s
DGPS	SBAS (default) [WAAS, EGNOS, MSAS, GAGAN]

REMOTE MANAGEMENT

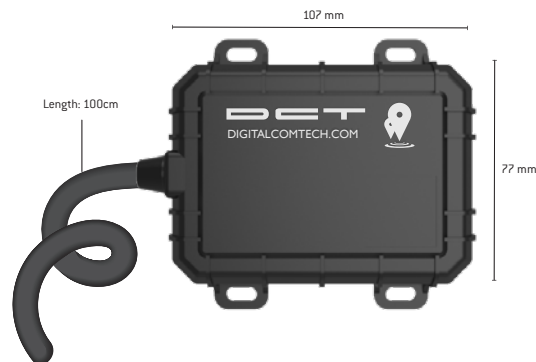
Pegasus IoT Cloud Gateway
SMS Commands
Syrus Cloud Management Platform

CERTIFICATIONS

FCC: XMR201910BG95M3
IC (Industry Canada): 10224A-2019BG95M3
CE (pending)
PTCRB (pending)
AT&T (pending)
UL (pending)

DIMENSIONS















PCB Dimensions (L x W)	95 mm x 69 mm
Enclosure Dimensions (L x W x H)	107 mm x 77 mm x 27.3 mm



TECHNICAL SPECIFICATIONS

CELLULAR MODEM SPECIFICATIONS			
With SIM holder	S4G-CATM1/NB2-M3-SH	S4G-CAT1-LA-SH	S4G-CAT1-EU-SH
With e-SIM (embedded SIM)	S4G-CATM1/NB2-M3-ES	S4G-CAT1-LA-ES	S4G-CAT1-EU-ES
Manufacturer/Model	Quectel BG95-M3	Quectel EG915U-LA	Quectel EG915U-EU
Data Transmission	LTE M: Max 588Kbps (DL)/Max 1.1 Mbps (UL) EDGE (2G): Max 296Kbps (DL)/Max 236.8Kbps (UL) CAT NB2: Max 127Kbps (DL)/Max 158.5Kbps (UL) CAT NB1: Max 32Kbps (DL)/Max 70Kbps (UL) GPRS (2G): Max 107Kbps (DL)/Max 85.6Kbps (UL)	LTE-FDD (Mbps) 10(DL)/5(UL) EDGE (2G): Max 296Kbps (DL)/Max 236.8Kbps (UL) N/A GSM (kbps) 85.6(DL)/85.6(UL)	LTE-FDD (Mbps) 10(DL)/5(UL) EDGE (2G): Max 296Kbps (DL)/Max 236.8Kbps (UL) N/A GSM (kbps) 85.6(DL)/85.6(UL)
Frequency Bands 4G LTE	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/ B26/B27/B28/B66/B85	B1/B3/B5/B7/B8/B20/B28	B2/B3/B4/B5/B7/B8/B28/B66
4G LTE NB2 Global	B1/B2/B3/B4/B5/B8/ B12/B13/B18/B19/B20/ B25/B28/B66/B71/B85	N/A	N/A
2G: Quad band	850/900/1800/1900MHz	B2/B3/B5/B8	B2/B3/B5/B8
Output Power	Power Class 5 21 dBm @ LTE Bands	Power Class 5 23 dBm @ LTE bands	Power Class 5 23 dBm @ LTE bands
Region/Operator	Global	Latin America	Europe, Australia, New Zealand

PINOUT

PIN	WIRE COLOR	SIGNAL	DESCRIPTION
1	 YELLOW	IGN	Ignition sensor: Detects ON when $v \geq 6.1$ V, OFF when $v \leq 4.6$ V. Max. 30 V. $Z_{in} > 30$ Kohm.
2	 WHITE/BLUE	IN1*	Active ground input. Detects ON when $v \leq 2$ V, OFF when $v \geq 2.5$ V or when HZ Max 30 V. $Z_{in} > 50$ Kohm.
3	 WHITE/ORANGE	IN2*	Active ground input. Detects ON when $v \leq 2$ V, OFF when $v \geq 2.5$ V or when hi-Z Max 30 V. $Z_{in} > 50$ Kohm.
4	 WHITE/GREEN	IN3*	Active ground input. Detects ON when $v \leq 2$ V, OFF when $v \geq 2.5$ V or when hi-Z Max 30 V. $Z_{in} > 50$ Kohm.
5	 WHITE/RED	1WIRE	Delivers 3.3 V, 50mA. Max. Standard and overdrive velocities.
6	 WHITE	AN1	Analog input 1. From 0 V to 28 V. $Z_{in} = 127$ Kohm.
7	 BLUE/YELLOW	OUT2	User output: open drain output. Max. 1.8 A, 30 V.
8	 BLUE/RED	OUT1	User output: open drain output. Max. 1.8 A, 30 V.
9	 YELLOW	CAN_H	Positive signal of the J1939/FMS bus. Connect to the vehicle's CAN_H cable. This cable is twisted together with the green CAN_L cable.
10	 GREEN	CAN_L	Negative signal of the J1939/FMS. Connected to the vehicle's CAN_L cable. This cable is twisted together with the yellow CAN_H cable.
11	 BLUE	RS232_RX	Data receiver.
12	 ORANGE	RS232_TX	Data transmitter.
13	 BLACK	GND	Device's electrical ground.
14	 RED	PWR	Main Power Cable, 8 - 38V DC. Connect directly to battery positive terminal.

*Inputs can be used as a 1kHz pulse counter.

EMBEDDED INTELLIGENCE ENGINE
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REMOTE DEVICE MANAGEMENT
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