NATIONAL METER MFG. CO.

INNOVA 21121 FARE METER

Product Features:

Integrated Unit of Fare Meter, Thermal receipt printer, GPS and GPRS Modem. Functionally, it is an integrated solution of Auto/Taxi Fare Meter, Receipt printer, GPS Vehicle tracker and Mobile data terminal with dispatch system. Economical solution for Radio Taxi or Auto Services.

Fare Meter - Calculation of Fare based on Distance travelled and waiting time. Configurable option of calculating total fare from distance travelled and waiting time separately or combined. Automatic shift to night fare during night hours. RTC time in synchronization with GPS time. Maximum deviation is 1 minute. Configurable free waiting time option. Device will send alerts for each metering event like Hired, Stopped, vacant and printout. Device will send data to server at each trip start and trip end events with all metering parameters, start time, end time and tariff ID.

Tariff Update – Update the programmed Tariff through PC based configuration utility through USB or through GPRS packets. Tariff update is password protected. You can query the programmed tariff through GPRS based commands.

Totalisers – Shift and cumulative totalisers for no. of trips, Paid Kilometers, Total travelled kilometers, paid fare, paid waiting fare. Printing of Totaliser data. Storage and printing of trip wise information for past 50 trips. Totaliser values will be sent to the server before clearing the totalisers or can be queried from the server.

Periodic data to server – Location information (Lat Long information along with speed and direction / GPS data valid / No. of Satellites), Metering status (Vacant / Hired / OFF duty/ Automotive battery Power OFF), Panic button status and Data status (Current data / History) on regular programmed intervals. The data rate can be programmed for different modes of operation (Hired / Vacant / Powered OFF / Panic mode).

Alarms / Alerts – Unit open tamper detection, SIM card removed from SIM holder detection, Power removed from External Automotive battery detection, Low level of Internal battery detection, External battery Low voltage or High voltage detection..

Panic Button – Panic button is provided on the Keypad. If the Panic button is pressed for 3 seconds continuously, the device will enter into panic mode. Panic message will be displayed on the LCD screen and an alarm packet will be generated. If GPRS is not available, device will send a SMS to configured SMS recipients. Two phone numbers can be configured for SMS receiving. The panic mode can be cleared by sending a Panic mode clear command from server or will be cleared automatically after programmed time out. Digital Input 1 can also be configured as External Panic button.

Device Configuration – APN, IP address, Port, Periodic data intervals, SMS numbers can be programmed though SMS, Device USB port or through GPRS commands.

Protocol – Communication with the server using TCP/IP protocol. TCP protocol based acknowledgement is treated as basic acknowledgement (of data received at the server).

Power failure or disconnection from automotive battery – Internal li-ion battery provides supply to Microcontroller, LCD, Keypad, Memory, GPS and GPRS modules. During mains power failure (automotive battery disconnection), Metering and printing operations will not be performed.

LCD display – Metering data, GPS locations, Physical location of vehicle (should be sent from server), GPRS status, GSM signal strength, configured Port and IP address, SIM number, automotive supply voltage, Internal battery charge status, Internal battery charge in %, IO status, totalisers, Messages and dispatch data sent by server will be displayed on different pages of LCD screen. You can scroll the pages with the help of arrow keys on the keypad.

Health Status – No. of Pending packets, Battery charge status, Paper present status, supply voltage, IO status and other diagnostics will be sent in regular intervals to the server or can be queried from the server.

Messaging and dispatch – You can broadcast messages or can send to individual devices from the server. You can also get the response for the messages sent as programmed. You can perform dispatch related operations also with this device.

Please read Device communication Protocol document to understand the features in detail.

Hardware Features:

LCD Graphical display of 128X64 pixels. Enables displaying alphanumeric data as well as graphical content on screen for better understanding of contents compared to the traditional LED 7 Segment display based fare meters. White color LED backlit for better viewing at Night and low light conditions. FSTN display for High contrast enables better viewing at Day light conditions also. Wide temperature range LCD display (-20 Deg to +70 deg C operating temperature) for longer life.

Capacitive Touch sensitive Keypad of 9 nos. of Keys with LED Illumination. Dedicated buttons for Metering, Printing. Panic button in Red color for easy identification. No Mechanical wear and tear. Long life. LED backlit illumination for trouble free operation at night and low light conditions. Found mostly in new Hi-end electronic equipments.

GPS Module - with internal Active Patch antenna suitable for receiving GPS data from satellites in urban environment. Industry proven SIRFstar IV ROM based GPS Engine. A-GPS support.

GPRS Module –Quad band, Class 12 GPRS with internal PCB Antenna. External Antenna on request. Voice communication supported by providing Phone receiver Jack on Connector Panel. Auto configuration of APN. SMS can be used as secondary mode of data transmission if GPRS connectivity not available.

Receipt Printer – Printing of Fare receipt after Trip End and Totalizer Values on 58mm wide Thermal paper roll. Paper not present indication. Transparent Paper holder clearly shows the quantity of roll in the holder. Sliding cap over paper-out slot for Dust protection. Printing of customized Fare receipts using PC based Message configuration utility or through GPRS. Printing Font sizes 16X24 and 12X17. Reverse printing, Underline in message printing.

USB Interface – USB 2.0 FS device. For downloading Configuration files, Firmware update and interfacing with other USB Host devices.

CAN Bus Interface – CAN bus external data interface for reliable data communications in automotive environment. Our 'Remote Terminal' accessory communicates with the Meter through CAN bus protocol. Remote Terminal can be configured as Master / Slave as per the requirement. If configured as Master, Metering related keys / buttons in the Fare meter will be disabled and Keys / buttons of the Remote terminal send.

commands to Fare Meter. Using CAN bus, you can add accessories like i-button, Magnetic swipe readers, smart card readers, RFID readers etc..

Sensor Input for distance measurement – Sensor Input from “National” make Adaptors/transducers for Autos and Taxis with mechanical Odometers. “Sensor Open” and “Sensor Short” detection. Pulse Tamper detection. Direct Pulse input from Taxis having electronic pulse Interface.

Digital Inputs – 3 nos. of digital inputs provided for applications like external panic switch, Ignition detection, AC on/off status etc.

Relay Outputs – 4 nos. of Semiconductor relay outputs for Controlling Roof light signals like “HIRED”, “VACANT” and “OFF DUTY”. These Outputs are fault tolerant and any output drive parameters can be programmed as per the type of lamp connected.

For Hire LED – “For Hire” LED illuminated indication on the back side of Meter. "For Hire" indicator will glow if the Vehicle is vacant.

Buzzer – Audible Indication for any key press event, on each fare increment, Dispatch and other messages from server. Buzzer can be disabled for fare increment event through device configuration.

Data Memory – On-board data memory to store packet data in the absence of GPRS. Minimum 15000 logs can be stored in the Meter's data Memory.

Battery Back-up – Battery back-up for LCD, Keypad, GPS and GPRS during power disconnection from automotive battery. Back-up time 4hrs. with GPRS data transmission rate of 2 minutes. Back-up time vary based on GPRS data transmission rate.

Housing – Plastic ABS +PC. Ingress protection rating - IP54 for protection against dust and water in outdoor environment (especially for installation in Auto rickshaw).

Technical Specifications		
MCU	Core	ARM Cortex M4
	Memory	256KB Flash, 60KB RAM
Data Flash	Size	2 MByte
Display	Type	Monochrome LCD 128x64 pixel Graphical Display
	Size	70 X 40 mm Active Area
	Dot Size	0.48 X 0.48 mm
	Backlight	White
Keypad	Type	Capacitive Touch Sense
	No. of Keys	9 nos.
	ESD Protection	Yes
	Backlit LEDs	Yes
Printer	Type	Thermal Printer
	Paper Width	58 mm
	Speed	14mm/Sec Max.
	Resolution	8 dots/mm
	Paper present Indication	Yes
GSM/GPRS	Frequency	Quad Band 850/900/1800/1900 MHZ
	GPRS Class	Class 12
	GPRS Mobile station class	Class B
	TCP IP	Yes, Internal to Modem
	Voice	Yes, Provided on 4 pin Phone Jack
	Antenna	Internal Patch Antenna

GPS	Frequency	L1-1475, 42 MHZ
	Output format	NMEA 0183
	Chipset	SIRFstarIV – ROM based
	Sensitivity Acquisition/track	-148dBm / -163dBm
	No. of PRN channels	48
	Accuracy	5 Meters Average CEP (Circular Error Probable)
	A-GPS	Yes
	Antenna	Internal, Active Patch Antenna
USB	Type	Device
	Speed	USB 2.0
	Connector	Micro USB AB
CAN	Speed	100 Kbps
	Stack	Proprietary
Sensor	Pulse Input	Electronic, Magnetic
	Tamper Detection	Yes. With our sensor adaptor
Digital Inputs	No. of Inputs	3
	Voltage Threshold	0-3V Low, 3 to 36V High
Relay Outputs	No. of Outputs	4
	Type	MOSFET Switch, Fault tolerant
	Max. Current	2A DC Max.
Buzzer	Operating Voltage	6V
Internal Battery	Type	3.7V Li-ion Rechargeable
	Capacity	1150 mAH
	Back-up Time	4 Hrs. with GPRS data rate of 2 minutes
RTC Battery	Type	Lithium, Primary
	Capacity	225 mAH
	Back-up Time	10 Years
Power Supply	Type	Switching Regulator
	Input Voltage Range	8 to 36 VDC
	Power Consumption	12 Watt Max.
Protection Circuits	Short circuit and over current	PPTC fuses 2 nos.
	Load Dump	TVS Diodes
	Reverse Polarity	Series Diode
	Conductive Emission	Common mode choke, Ferrite beads
	ESD	ESD Diodes
Temperature	Operating Range	-10 Deg. C to +60 Deg. C
Dimensions	in MM	190 X 92 X 85
Enclosure	Material	Plastic ABS + PC
	Ingress Protection	IP 54
Weight	in Kg.	0.810

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