

Loop-iNET Intelligent Network Element Management System (EMS)

Features

- Web based application following design of thin client computing
- Windows style user desktop environment
- Supported browsers: Firefox; Internet Explorer (IE)
- Supported server platform: MS Windows
- Database server: MySQL RDBMS
- Multi-language support (upon request)
- Automatic load balancing for the major components to increase performance of iNET server
- Hot standby server redundancy with automatic failover to provide high availability(HA) for the major system components
- System access security with role-based user access control. The access privilege can be customized through any combination of operation functions and managed NEs. User inherits privileges automatically from group privilege
- System operation and user access log
- Multi-hierarchical subnet structure allows user to provide multi-level network topology display
- SNMP based management system that supports SNMP functions including commands, alarms, and statistics gathering. Other protocol support includes ICMP, NTP, and Syslog.
- Up to 100,000 Network Elements(NEs) and unlimited concurrent user connection logged into the iNET server
- Network elements of same model with different versions managed by iNET simultaneously
- Node statistics data and alarm reports can be displayed and saved in MS Excel/PDF format.
- Enriched topology management provides zoom-in/zoom-out and drag-and-drop functionalities in view, subnet view, link and NE panel status
- Alarm management that provides automatic suppressing and notification via Email with advanced filtering system
- Build-in system monitoring and NE connectivity tool with NE connectivity status for system administration purpose
- Robust and reliable design based on distributed system architecture which provides flexible and scalable solution for network expansions.
- Performance management shows current statistics for the NEs and system
- Advanced optional functions:
 - Currently Active Alarm Summary (CAAS)
 - Graphical Cross-connection Tool (GXC)
 - North Bound Interface: v1/v2C/v3 (NBI)
 - Disaster Recovery (DR)
 - TDM Circuit Marker (TDMCKT)
 - Ethernet connectivity fault management (eCFM)
 - Loopback/BERT tool (DGN)
 - File Transfer (FT) supporting NAT configuration
 - Trend Grapher (TG)

Description

Loop-iNET, based on the scalable and modularized architecture, is a set of intelligent network management software programs which can be taken as both Element Management Layer (EML) and Network Management Layer (NML) based the Telecommunications Management Network (TMN) model. This program is flexibly designed to manage your network regardless of size or complexity. You can add or remove any component as you want without affecting operations of the system. It provides a GUI (graphical user interface) for the management of a communications network containing Loop Telecom products.

The workforce management is facilitated by the multiple levels of login security, which provides the network manager great flexibility of work assignment. The hierarchical grouping feature, cities, buildings, and rooms, allow rapid access to the desired network element.

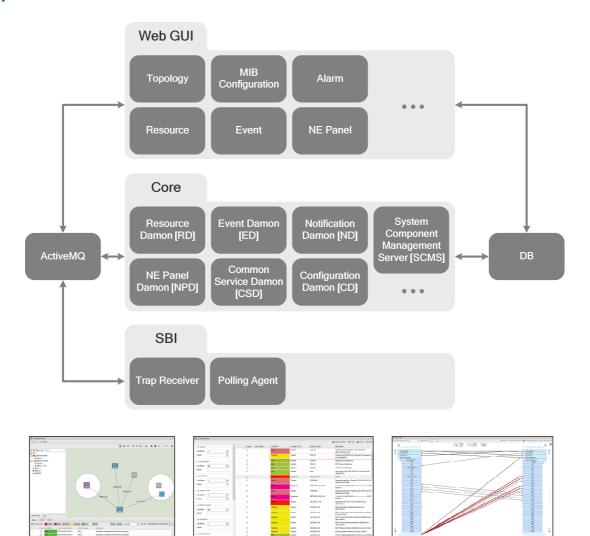
All SNMP provided functions are available in Loop-iNET. This includes the execution of all commands, the gathering of all statistics, and the display of all alarm conditions in real time. The map and the reports can be printed as well as viewed directly from the iNET.

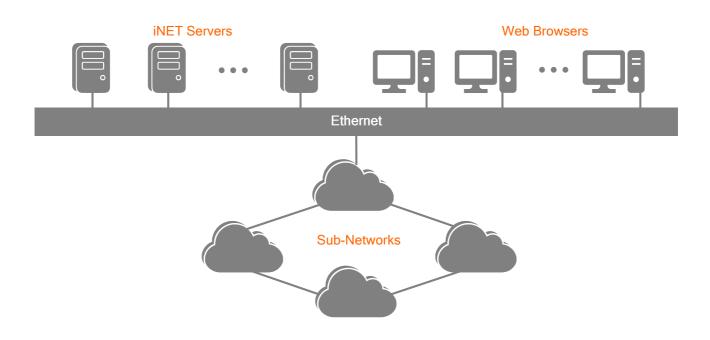
By offering feature-rich functionalities, Loop-iNET maximizes the network efficiency, minimizes the operating costs and reduces the potential risks. Moreover, it supports the protocols of SNMP, NTP, and more (upon request). Customization adaptation into different protocols is allowed and upon request.





Loop-iNET Architecture







Loop-iNET Main Functions

Topology Management

- Offers topology view for:
 - NE/Subnet topology
 - Panel view of equipment (NE)
 - Resource tree
 - MIB tree
- Supports zooming in and zooming out of topology views
- Allows users to create a desired layout to reflect the actual network
- Offers drag-and-drop approach for a user to create an NE icon
- Port-level topology link

NE GIS View

- Manages physical NE locations
- Generic map view

■ NE Auto-Discovery Management

- Manages multiple discovery agents
- Discovers non-SNMP equipments
- Supports IPv4/v6
- Supports SNMPv1/v2c/v3

Configuration Management

- Provides remote control on NE's configuration
- General parameters setting
- Provides MIB based monitoring and setting on NE, including diagnosis and performance.

Alarm Management

- NE alarm/event collection
- Alarm filtering
- Alarm display
- Alarm history
- Alarm notification
- Configurable alarm audio

User & Security Management

- Supports adding, deleting, and modifying operations on user account and a group of users
- Provides operation privileges and scope assignments
- Provides user operation log
- Supports multi-condition queries on user operation log
- Provides user access log
- Supports multi-condition queries on user access log

■ iNET Self-Management

- Supports real-time monitoring on iNET software processes
- Supports real-time monitoring on NE connectivity
- Supports database backup and recovery
- Provides date and time synchronization between iNET and NE
- Provides cloud disk to share files over the network

Loop-iNET Advanced Optional Components

■ System Redundancy and Protection

- Disaster Recovery (DR) Solution
 - Provides geographical system redundancy and an independent system on each site



- DR status monitoring
- Automatic data replication between redundant sites
- System failover and recovery using hot-standby/warm-standby mechanism

Graphical Cross-connection Tool

- NE-Level Cross Connect Configuration
- Provides equipment cross-connect creation/deletion/display views.
- Supports Normal/SNCP/ULSR cross-connection types

■ eCFM(Ethernet Demarcation Device Connectivity Fault Management) Tool

- Point-to-Point diagnosis for supported IP based devices
- Supports VPLS and Hub/Spoke modes

■ File Transfer

- Configuration upload/download
- Firmware download

Currently Active Alarm Summary(CAAS)

- Display Equipment CAAS by different severities
- Query CAAS information based on guery conditions

Note: This function is available on some selected Loop products supporting CAAS function as listed in iNET User's Manual.

North Bound Interface(NBI)

- Supports SNMP v1/v2c NBI for Alarms
- Supports SNMP v3* NBI (* Future Option)
- Other NBI components are available upon request and additional NRE costs are per-project based.
 Please contact Loop sales representatives for details.

Trend Grapher

- Real-time data traffic monitoring
- Trend report in simple and clear graphics

Threshold

- Set threshold for alarm triggering
- Support TG sensor setting for now

■ TDM Circuit Management

- Supports TDM circuit marker
 - PDH normal circuit marker creation, deletion, query, modification, route discovery and route table export (Not including cross-connection creation/deletion)
- Supports circuit group manager
 - Circuit group creation, deletion, modification and route table export

TDM Diagnostics Management

- Graphical Loopback/BERT test tool
- Port level diagnostics
- Topolink level diagnostics

Third-party System Hardware

Note 1: Hardware system shall be provided by local SI or end-customer.

Note 2: This recommendation list below is the minimum system hardware requirement and it is for reference only. Please consult with a Loop representative for precise hardware spec and quantities.

Hardware Specifications for iNET Server

Item	Descriptions	
Typical Application	For all numbers of NEs	
Processor	Intel Xeon® E5-2600 series v2 or above	
Memory	8GB or above	



Hard disk	160GB/7200rpm or above
DVD R/W	DVD ROM
NIC	10/100/1000M
Graphics	GeForce 600 Series or above
Mouse	USB Wheel or Optical Mouse
Operating System	Windows 2008 R2 Server Enterprise Windows 7 Professional, Enterprise, Ultimate (32 or 64 bit) Windows 2008 R2 Server Foundation/Standard Windows 2012 R2 Server Foundation/Essentials/Standard Windows 10 Professional

■ Hardware Specifications for iNET Client PC

Item	Descriptions
Typical Application	For all numbers of NEs
Processor	Intel Core i3 2.4 GHz or above
Memory	4GB or above
Hard disk	160GB/7200rpm or above
DVD R/W	DVD ROM
Sound card & Speaker	Sound Interface and Speakers
NIC	10/100/1000M
Graphics	GeForce 600 Series or above
Mouse	USB Wheel or Optical Mouse
Monitor	22" LCD (1024*768) or above
Operating System	Windows XP Professional Windows 2008 R2 Server Enterprise Windows 7 Professional, Enterprise, Ultimate (32 or 64 bit) Windows 10 Professional
Web Browser	Firefox/Internet Explorer (IE)



Third-party System Software

Third-Party Software / Open Source Software

Item	Туре	Mandatory/ Optional	Description	Name	Remarks
1	Java Runtime Environment	М	One for each iNET server	JDK	Version 6~8
2	Web Server / Application Server	М	iNET can run on Apache Tomcat or Jboss AS	Tomcat	Version 6 or 7
3	Database	М	Relational database management system	MySQL	MySQL Community Server version 5.7
4	Java Messaging	М	JMS (Java Message Service) message broker	ActiveMQ	Version 5.4 or above
5	Web Browser	М	One browser for each iNET thin client	Firefox	V52 Extend Support Release (ESR) Version 54~58
6	Microsoft Excel	0	iNET report is in character-delimited format. One Microsoft Excel for each user client machine is required	Microsoft Excel	Version 11

Note: For Firefox v52 or higher version, Telnet function requires installing Firefox Extend Support Release (ESR).

Associated Management System Standards

Standards

ITU-T M.3100—Generic Network Information Model. ITU-T M.3200—TMN Management Service: Overview.

ITU-T M.3400—Management Functions

Loop-iNET Ordering Information

To order the Loop-iNET products, you must select maximum one iNET Server, the number of iNET Concurrent User License (s), and other option (such as NE management license) you would like to purchase. If you already have an iNET Server Software and need an upgrade on it, leave the Server Software off of your order form and simply list the option(s) you require and provide Loop with the serial number of the iNET product you have already purchased.

iNET Server Software

Please select the iNET Server Software if desired. If you're purchasing additional options, such as NE license, for your existing iNET Server, leave this off of the order form

iNET Server	Description	Notes
Loop-iNET-Server-Lite5-o s-lang	Loop-iNET Server Software Lite5 Edition. When Lite5 Edition is purchased, the iNET system can manage a Network Scale of up to 5 NEs at maximum.	The server software does NOT including Server Hardware, Database software and installation services. The server software includes basic functions: alarm monitoring
Loop-iNET-Server-Lite10- os-lang	Loop-iNET Server Software Lite10 Edition. When Lite10 Edition is purchased, the iNET system can manage a Network Scale of up to 10 NEs at maximum.	



Loop-iNET-Server-Lite20- os-lang	Loop-iNET Server Software Lite20 Edition. When Lite20 Edition is purchased, the iNET system can manage a Network Scale of up to 20 NEs at maximum.	SNMP based configuration including diagnosis, performance, reports.
Loop-iNET-Server-Standa rd- os-lang	Loop-iNET Server Software Standard Edition. When Standard Edition is purchased, the iNET system can manage a Network Scale of up to 100 NEs at maximum.	 All the editions of server software don't include any NE licenses. You still need to additionally purchase the exact NE licenses
Loop-iNET-Server-Profess ional- os-lang	Loop-iNET Server Software Professional Edition. When Professional Edition is purchased, the iNET system can manage a Network Scale of up to 2000 NEs at maximum.	for your network. Where "os" and "lang" are defined in tables below.
Loop-iNET-Server-Enterpr ise-os-lang	Loop-iNET Server Software Enterprise Edition. When Enterprise Edition is purchased, the iNET system can manage a Network Scale of up to 10,000 NEs at maximum.	

Where os is the Operating System selection (Choose the same Operating System for all os)

os =	Description	Notes
Windows	Microsoft Windows server platform	For Windows server

Where lang is the language selection.

lang =	Description	Notes
EN	English	EN is the Default Language supporting all Loop products
SC	Simplified Chinese	Simplified Chinese or Traditional Chinese version only supports
TC	Traditional Chinese	selected products, please contact your nearest Loop sales representative

■ iNET Concurrent User Software License

Please specify the number of concurrent user licenses you will be serving.

r lease specify the number of concurrent user licenses you will be serving.		
GUI Clients	Description	Notes
Loop-iNET-User	Each Loop-iNET concurrent user license, not including	Please order number of iNET
	Windows OS, MS Excel, and H/W	concurrent user license(s) required.

■ <u>iNET DR Software License</u>

Please Select the Disaster Recovery (Redundancy) Control Software if desired. If DR is not desired, leave it off of the order form.

iNET DR Software	Description	Notes
Loop-iNET-DR-os	Loop-iNET DR (Disaster Recovery) Software license for each physical server. This DR software is in charge of redundancy status monitoring, database replication, and load balancing, system failover and	 To order this item, user needs to purchase one additional copy of iNET Server Software.
	recovery.	Each physical server requires a license.
		Where os is defined in tables below.



■ NE Configuration Tool Options

Graphical Cross-connection Tool Software License

INET GXC Tool	Description	Notes
Loop-iNET-GXC-AM3440- os	Graphical Cross connection tool for AM3440	AM3440-A/B/C/D supported
Loop-iNET-GXC-O9400R- os	Graphical Cross connection tool for O9400R	O9400R-CC4/CC16/PTN supported
Loop-iNET-GXC-O9400S A- os	Graphical Cross connection tool for O9400SA	O9400SA-1USA/-1US4 supported
Loop-iNET-GXC-O9500R- os	Graphical Cross connection tool for O9500R	O9500R-CC4/CC16/PTN supported
Loop-iNET-GXC-V4150-o s	Graphical Cross connection tool for V4150	
Loop-iNET-GXC-O9550-o s	Graphical Cross connection tool for O9550	O9550-CGA/CGC/ CGD supported
Loop-iNET-GXC-O9170S- os	Graphical Cross connection tool for O9170S	
Loop-iNET-GXC-O9150S- o s	Graphical Cross connection tool for O9150S	

■ Circuit Software License

iNET TDM Circuit Management	Description	Notes
Loop-iNET-TDMCKT-AM3 440- os	TDM Circuit Marker for AM3440 and Circuit Group Manager. It includes GXC Tool Software License by default.	AM3440-A/C/D supported
Loop-iNET-TDMCKT-O94 00- os	TDM Circuit Marker for O9400 and Circuit Group Manager. It includes GXC Tool Software License by default.	O9400-CC4 supported

■ eCFM Management Software License

INET eCFM Tool	Description	Notes
Loop-iNET-ECFM-IP7930-	Ethernet Demarcation Device Connectivity Fault	ID7000D/C accepted
os	Management tool for IP7930	IP7930B/S supported

Diagnostics Software License

iNET Diagnostics	Description	Notes
Management		
Loop-iNET-DGN-AM3440- os	Support Loopback/BERT tool for AM3440	AM3440-A/B/C/D supported
Loop-iNET-DGN-O9500-o s	Support Loopback/BERT tool for O9500	O9500-CC16 supported
Loop-iNET-DGN-O9550-o s	Support Loopback/BERT tool for O9550	O9550A supported

■ iNET Language Localization Tool License

iNET Language Localization Management	Description	Notes
Loop-iNET-LLD- os	One-time named user developer license for iNET language localization toolkit.	User under developer license agreement has exclusive right to the language package developed by the user. However, each iNET system with developer language package needs to have a valid iNET Language Localization Runtime (LLR) license.
Loop-iNET-LLR- os	Exclusive and non-transferable run-time software license for the iNFT language package developed under	



developer license agreement.

■ <u>iNET Feature Options</u>

Please specify which iNET types you need. You may choose any or all of the available features.

iNET Features	Description	Notes
Loop-iNET-FT- os	Upload configuration Download configuration/firmware	File transfer function only supports selected products, please contact your nearest Loop sales representative
Loop-iNET-CAAS- os	Currently Active Alarm Summary	CAAS function only supports selected products, please contact your nearest Loop sales representative
Loop-iNET-NBI-ALARM- os	Northbound Interface compliant with SNMP v1/v2C including pre-defined SNMP/MIB Alarm support for: 1) Alarm traps 2) Current alarm table(s) 3) History alarms table(s)	All Alarm objects are coming with pre-defined properties and format. Any change or modification request on this is subject to additional NRE charge.
Loop-iNET-NBI- INVENTORY- os	Northbound Interface compliant with SNMP v1/v2C including pre-defined SNMP/MIB Inventory/Resource support for: 1) NE table(s) 2) Plug-in card table(s) 3) Port table(s)	All Inventory objects are coming with pre-defined properties and format. Any change or modification request on this is subject to additional NRE charge.
Loop-iNET-TG- os	Trend Grapher shows trend report in simple and clear graphics	Please contact your nearest Loop sales representative for more details
Loop-iNET-THR- os	Threshold allows setting for alarm triggering.	Please contact your nearest Loop sales representative for more details
Loop-iNET-NRE- os	NRE charges for special customization per project basis - Special Feature Development - 3rd-party Equipment Management Integration into iNET - Other North Bound Interface (NBI) components - Language Support - Customized report - Customized GUI	Where " os " are defined in tables below.

Where os is the Operating System selection (Choose the same Operating System for all os)

os =	•	<u> </u>	Description	 Notes
Windows		Microsoft Window	s server platform	For Windows server

■ <u>iNET NE Management Licenses</u>

The total number of network element (NE) licenses you need is the sum of numbers of NE for each NE type.

Language Support: EN (English), SC (Simplified Chinese) or TC (Traditional Chinese)

iNET NE License (Devices List)	Description	
Loop-iNET-AM3440-CHA	Each AM3440-CHA Major NE management license (EN, TC)	
Loop-iNET-AM3440-CHB	Each AM3440-CHB Major NE management license (EN)	
Loop-iNET-AM3440-CHC	Each AM3440-CHC Major NE management license (EN, TC)	
Loop-iNET-AM3440-CHD	Each AM3440-CHD Major NE management license (EN)	
Loop-iNET-C5500A	Each C5500A Major NE management license (EN)	
Loop-iNET-E15002S	Each E15002S Major NE management license (EN, TC)	
Loop-iNET-G7860	Each G7860 Major NE management license (EN)	
Loop-iNET-IP6300	Each IP6300 Major NE management license (EN)	
Loop-iNET-IP6320	Each IP6320 Major NE management license (EN)	
Loop-iNET-IP6320A	Each IP6320A Major NE management license (EN, TC)	
Loop-iNET-IP6330	Each IP6330 Major NE management license (EN, TC)	
Loop-iNET-IP6510	Each IP6510 Major NE management license (EN, TC)	
Loop-iNET-IP6510-LN	Each IP6510-LN Major NE management license (EN)	
Loop-iNET-IP6610	Each IP6610 Major NE management license (EN)	



Loop-iNET-IP6700	Each IP6700 Major NE management license (EN, TC)
Loop-iNET-IP6702	Each IP6702 Major NE management license (EN)
Loop-iNET-IP6702A	Each IP6702A Major NE management license (EN)
Loop-iNET-IP6704A	Each IP6704A Major NE management license (EN, TC)
Loop-iNET-IP6716	Each IP6716 Major NE management license (EN, TC)
Loop-iNET-IP6750	Each IP6750 Major NE management license (EN, TC)
Loop-iNET-IP6763	Each IP6763 Major NE management license (EN)
Loop-iNET-IP6810	Each IP6810 Major NE management license (EN)
Loop-iNET-IP6820	Each IP6820 Major NE management license(EN, TC)
Loop-iNET-IP6830	Each IP6830 Major NE management license(EN)
Loop-iNET-IP7925	Each IP7925 Major NE management license(EN)
Loop-iNET-IP7930B	Each IP7930B Major NE management license (EN)
Loop-iNET-IP7930S	Each IP7930S Major NE management license (EN)
Loop-iNET-O9100S-3U	Each O9100S-3U Major NE management license (EN)
Loop-iNET-O9150S	Each O9150S Major NE management license (EN)
Loop-iNET-O9170S	Each O9170S Major NE management license (EN)
Loop-iNET-O9330	Each O9330 Major NE management license (EN, TC)
Loop-iNET-O9340SA	Each O9340SA Major NE management license (EN, TC)
Loop-iNET-O9400R-CC4	Each O9400R-CC4 Major NE management license (EN)
Loop-iNET-O9400R-CC16	Each O9400R-CC16 Major NE management license (EN)
Loop-iNET-O9400R-PTN	Each O9400R-PTN Major NE management license (EN)
Loop-iNET-O9400SA-1US1	Each O9400SA-1US1 Major NE management license (EN)
Loop-iNET-O9400SA-1US4	Each O9400SA-1US4 Major NE management license (EN)
Loop-iNET-O9500R-CC4	Each O9500R-CC4 Major NE management license (EN)
Loop-iNET-O9500R-CC16	Each O9500R-CC16 Major NE management license(EN)
Loop-iNET-O9500R-PTN	Each O9500R-PTN Major NE management license(EN)
Loop-iNET-O9550-CGA	Each O9550-CGA Major NE management license (EN)
Loop-iNET-O9550-CGC	Each O9550-CGC Major NE management license (EN)
Loop-iNET-O9550-CGD	Each O9550-CGD Major NE management license (EN)
Loop-iNET-T25002S	Each T25002S Major NE management license (EN)
Loop-iNET-V4150	Each V4150 Major NE management license (EN, TC)
Loop-iNET-V4200-9	Each V4200-9 Major NE management license (EN)
Loop-iNET-W8140	Each W8140 Major NE management license (EN, SC, TC)
Loop-iNET-W8150	Each W8150 Major NE management license (EN)
Loop-iNET-W8230	Each W8230 Major NE management license (EN)
Loop-iNET-RemoteNE	Each Indirectly Managed Equipment(IME) management license(See the table below)
Loop-iNET-3rdNE	Each 3rd Party NE management license

Note: 1. Please specify, for each NE type, the actual number (n) of NEs.

2. The specific DME and card types connected with the remote IME are listed as below.

Remote IME	Local DME	Card Type
O9340SA	O9340SA	
E15002S	E15002S	
H3310S	C5500A/C5600/AM 3440	H3310R
IP6750	IP6750	

■ iNET Software Maintenance Agreement (SMA)

Purchase of the 1st year SMA is mandatory. Please specify how many years of iNET SMA you desire to purchase. The iNET software upgrade/patches on existing functionality are only available within the maintenance period purchased.

Note: Software maintenance packages are available only in yearly basis starting from date of purchase of iNET. The price quoted for the new SMA applies only before the expiration of the current SMA.

iNET SMA Type	Description	Notes
Loop-iNET-SMA	 Loop-iNET Annual Software Maintenance Access to software patches/upgrade, including feature enhancements and major new versions. 5x8 (GMT+8) field problem remote diagnosis. 	 Purchase of the 1st year SMA is mandatory. Please order the number of years of SMA coverage you want to purchase.



iNET SMA Type	Description		Notes
Lass NET OMAG	5x8 (GMT+8) consulting via e-mail, phone call and IMs (Skype,) Remote commencement of software patching	•	All remote support activities, if purchased, are made possible through remote supporting tools, such as VPN or remote desktop. It's the end customer's
Loop-iNET-SMAG	Loop-iNET annual Software Maintenance Agreement (SMA) Gold including: - Access to software patches/upgrade including feature enhancements and major		responsibility to provide all necessary remote access connections and tools at the customer side.
	new versions 7x24 e-mail consulting - 7x24 real-time consulting via phone call and	•	New purchase of iNET components and services will NOT reinstate the expired SMA automatically.
	IMs (Skype,)7x24 field problem remote diagnosisRemote commencement of software patching	•	5x8 denotes Monday through Friday from 9:00am to 5:00pm (GMT+8)
Loop-iNET-RSMA	Loop-iNET annual reinstatement of SMA (software maintenance agreement).		SMA will cover Loop-iNET Software only, and will not cover problems in system hardware, operating system platform, network condition, and viruses.
	Since Loop-iNET software will keep evolving to support new plug-in cards and new features, it is very important to maintain your maintenance service and reserve your access in software upgrade package. If the purchased SMA has expired, you need to extend the maintenance service by reinstating your SMA and purchasing RSMA for all prior unpaid year(s).		
	Customer with existing iNET running shall reinstate any expired SMA before making any new order of iNET software components and services.		
	It is mandatory to maintain valid SMA when any customized functions are needed in the later phases, a NRE charge might be required.		



Accessories

User's Manual	
Loop-iNET-UM User's Manual (paper copy).	
	Note: A CD version of the manual is already included as standard package.

Ordering Example

Ordered Item	Quantity	Notes
Loop-iNET-Server- Enterprise -Windows-EN	1	English Version; Maximum is 1
Loop-iNET-User	2	Fill in the number of concurrent user licenses required (2 concurrent user licenses in the case for example)
Loop-iNET-NBI-ALARM- Windows	1	Northbound Interface support SNMP v1/v2C/v3*; Maximum is 1
Loop-iNET-IP6820	50	NE Management License of 50 IP6820s
Loop-iNET-SMA	1	1 year of annual software maintenance agreement service provided by Loop



LOOP TELECOMMUNICATION INTERNATIONAL, INC. ISO 9001 / ISO 14001

Worldwide	Europe	America	Australia & New Zealand
6F, No. 8, Hsin Ann Road	Rue de Culot, 13	8 Carrick Road	3 Imperial Ave, Mount
Hsinchu Science Park	BE-1402 Nivelles	Palm Beach Gardens	Waverley, Victoria 3149,
Hsinchu, Taiwan 30078	Belgique	Florida 33418, U.S.A.	Australia
+886-3-578-7696	+32-496-54-27-44	+1-561-627-7947	+61-413-382-931
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