

Senstar® 100

Application Note # 06

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Starcom IP implementation

Introduction

Starcom (Version 2.0) is Senstar's generic serial data interface protocol as defined in TM-8045-001-00C. Senstar 100 (S100) supports one or many Starcom serial device interfaces as defined in each S100 database. The Starcom interface provides integration of a wide variety of host devices into the S100 PIDS for input / output control and display purposes. Any host device that has implemented a Starcom communications interface can be connected to S100 via a serial port.

With the installation of QNX4 TCP/IP networking protocols on S100 systems as part of the Network Time Protocol (NTP) function it is possible to provide the Starcom communications protocol with IP sockets connectivity. Since most Senstar 100 PCs have Ethernet Network Interface Cards (NIC) hardware, a Starcom IP implementation can take advantage of Ethernet LAN infrastructure for S100 and Starcom device connectivity.

Starcom IP Implementation is available with Senstar 100 version 6.22 and later.

Protocol Messages

Starcom IP will use the same application messages as serial Starcom. See the Starcom Communication Protocol Version 2.0 Technical Memorandum (TM-8045/001/00). Physical (serial) interface control will no longer be required and so will not be part of the data packet exchange. Serial packet escape codes, STX, ETX, handshaking, error detection and flow control will be dropped. As such, message handlers above the physical and network interface layers i.e., the transport layer, will not need to be changed on any host implementation.

Message Format

Messages sent or received have the following format:

SIG	LEN	DATA
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Where:

SIG: signature bytes: always 0xE0, 0x34

LEN: 2 byte length of data block: LSB, MSB e.g., 07 00

DATA: data bytes to be sent or received. This constitutes the Starcom application message(s).



e.g., SET POINT NUMBER and ALARM STATUS VALUE messages:

02	02	01	00	03	01	01
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Messages are variable length, they start with a 2 byte Signature (0xE0, 0x34) followed by a 2 byte Length. The Length gives the number of data bytes making up the message data. The maximum length supported is 128 bytes. This is more than enough since Starcom protocol messages are always less than 20 bytes (except for DATALOG messages).

For the above SET POINT NUMBER and ALARM STATUS VALUE Starcom message, the IP data packet (in hex bytes) is:

E0	34	07	00	02	02	01	00	03	01	01
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Senstar 100 database changes

To take advantage of the new IP connectivity existing Starcom devices in S100 databases will only need to have their physical connection type changed using the S100 site creation hardware setup application. The device i/o point space and application message exchange with the S100 system will not change. Similarly the physical Starcom serial interface device will need to change to a Starcom IP interface device. This IP capable client host device will need to allow for redefinition of its physical interface from serial to IP, and to manage redundant IP connections, one to the PIDS and one to the FAAS.

Connections

Senstar 100 systems often are multi-CU (Control Unit). A CU is a PC running the S100 software and a site specific database. The dual S100 system is to distribute operator functionality and provide redundancy. In CSC terminology these CUs are known as the PIDS and the FAAS. Generally speaking when both CUs are UP, the PIDS handles perimeter sensors and cameras, and the FAAS handles everything else (internal building sensors and controls).

The serial interface from a Starcom device is split via a serial mux / switch to connect to this pair of S100 PCs (PIDS and FAAS). The S100 system handles which connection is active, the Starcom device is unaware it can be communicating with different PCs.

In an Ethernet LAN the Starcom IP client device will now need to be configurable to connect to one S100 (PIDS) or the other (FAAS). One to be a primary interface choice, the second to be an alternate if the connection is lost. Connection timeouts and retries should be configurable as well.

Upgrade of Senstar 100 Software

Senstar 100 support for Starcom IP is available with software (s/w) version 6.22.

To upgrade to version 6.22:

- a. Boot the CU with the QNX boot disk (p/n J2SW2200).
- b. Load J2SW2300-622 and J2SW2500-622 software packages.

Note that site creation database version has been incremented to handle the Starcom IP connectivity settings. After upgrade to version site creation s/w version 6.22 you must up convert your site creation database(s) using the command:



cvrt_cfig_db.exe

On the QNX command line.

It is recommended that you save your site creation database(s) to floppy disk before performing the up conversion.

S100 application software version 6.22 will run on previous site data (e.g., version 6.21). However to get the Starcom IP connectivity you will have to regenerate your database with the new Starcom IP settings as you define in the site creation hardware configuration menus.

Senstar 100 Configuration

Within site creation, hardware configuration menus the Starcom device type has added fields to define:

Mode: Server or Client, the Starcom device is usually a client (connects to a listening S100).

IP Address: in dotted decimal notation (e.g. 192.168.1.101).

Port: the base socket port number for the connection. This will be a port ≥ 4001 .

IP primary node: in a multi-CU database this defines the preferred connection, usually the lower node ID of the two CUs. In a single CU system this can be 0 to default to the current CU node ID.

IP number of hosts: this is typically 1. If the Starcom IP connection is to a dual-CU system then set this to 2.

Once these settings are entered, select a **NETWORK** port assignment for the Starcom device for each CU in the system.

More on IP number of hosts

Typically the Starcom device is a client that connects to the one of the listening S100 servers, either the PIDS or the FAAS with preference given to the lower numbered CU node ID. This is usually the PIDS computer. If this connection is not available the Starcom device will alternately connect to the next higher numbered CU node ID (FAAS).

In the case of the S100 system operation as a client, it is asserted that this S100 is a single CU system that is connecting to a dual S100 system (PIDS and FAAS). The IP address defined for the Starcom interface is for the preferred connection. The alternate connection is determined by that IP address +1. Therefore it is necessary for the PIDS and FAAS servers in this case be adjacent IP addresses.

e.g.,

PIDS	192.168.1.101	
FAAS	192.168.1.102	
S100 Starcom Client	192.168.1.105	Single CU satellite system

Note this corresponding sample /etc/hosts file:

192.168.1.101	node1
192.168.1.102	node2
192.168.1.105	node5

Example Site Creation Setup

The following is the setup of a single Starcom IP device in the PIDS/FAAS database and in a single CU satellite S100 database using the IP addresses listed above.

S100 PIDS and FAAS (servers) database

Starcom Device

Mode	Client	: we are the server
IP	192.168.1.105	: this IP is for reference only
Port	4003	
IP primary node	1	: the dual-CU system will favour the connection to node 1
IP number of hosts	1	: connecting to a single CU system

S100 Starcom Client database

Starcom Device

Mode	Server	: we are the client
IP	192.168.1.101	: this is the preferred server IP, alternate server IP is 192.168.1.102
Port	4003	
IP primary node	0	: default to my node ID
IP number of hosts	2	: connecting to a PIDS/FAAS system

