

6 BOOTSTRAP METHODS

6.1 Bootstrap Methods

There are four different methods to bootstrap the ETRAX 100LX. They are presented in table 6-1 below.

The cache is always initialized, regardless of the bootstrap method. The bus status pins bs3, bs2, bs1, and bs0 are sampled upon reset going high, and their values are stored to the internal register R_BUS_STATUS. The values of the bus status pins bs2 and bs1 determine which bootstrap method to use.

Values on pins bs2 and bs1 at reset	Bootstrap method	Description
00	Normal bootstrap	Execution starts at address 0x80000002.
01	Serial bootstrap	Serial port 0 is used, configured at 9600bps, 8 bits without parity, one start and one stop bit).
10	Network bootstrap	The network bootstrap code is received in an Ethernet packet through the SNI or MII interface.
11	Parallel bootstrap	Parallel port 0 is used.

Table 6-1 Overview of the ETRAX 100LX Bootstrap Methods

6.1.1 Normal Bootstrap

Execution starts at address 0x80000002.

6.1.2 Serial Bootstrap

Serial port 0 is used, and is configured at 9600bps, 8 bits without parity, one start and one stop bit. A total of 784 bytes will be received. This data is stored in the cache, mapped to the address 0x380000F0, where execution then starts.

6.1.3 Network Bootstrap

The network bootstrap code is received in an Ethernet packet, as shown in table 6-2, through the SNI or MII interface. When the network bootstrap is used, the packet received must be an Ethernet packet (formatted to the IEEE 802.3 standard).

Packet byte nr.	Content (hex)	Description
0 - 5	01 40 8c 00 01 00	Destination address. This is a multicast address within the Axis Ethernet address block. This address is fixed.
6 - 11	XX XX XX XX XX XX	Source address. The address of the host transmitting the bootstrap packet. This address is not checked.
12 - 13	type-length (2bytes)	This is currently not checked but it is recommended that the contents follow the 802.3 standard.

Table 6-2 Network Bootstrap Packet Header

Packet byte nr.	Content (hex)	Description
14 - 21	AA AA 03 00 40 8C 88 56	A SNAP header featuring the Axis vendor code (same as the Ethernet address block). This is the Axis ether-type specifically assigned for this purpose. This is currently not checked but is strongly recommended for network interoperability.
22 - 25	FF FF FF FF	A tag signalling this packet as a bootstrap datagram. This is currently not checked, but is recommended for re-use of the Axis SNAP header.
26 - 29	00 00 00 00	The bootstrap packet sequence number. The number must consist of only zeros in the first packet in the bootstrap sequence. This field is fixed.

Table 6-2 Network Bootstrap Packet Header

After this header, the network bootstrap code starts. The downloaded program can be up to 1484 bytes in this package, and will be stored in the cache. The first byte of the destination address is mapped to address 0x380000E6, and execution will start at address 0x380000F4.

The SNI and MII interfaces are selected by the value of the MDIO pin at start-up:

MDIO pin value	Interface
0	SNI
1	MII

Table 6-3 Value of the MDIO Pin at Start-up

6.1.4 Parallel Bootstrap

Parallel port 0 is used. A total of 784 bytes will be received. The parallel port will immediately start in ECP reverse mode for the transfer of this data to the cache where it is stored. The data is mapped to address 0x380000F0, where execution then starts. IEEE 1284 negotiation phase is not performed.