

# AP16012

## C16x

### Bootstrap Loader - IDB / Half Duplex

Microcontrollers



Never stop thinking.

<b>Revision History:</b>		2004-02	<b>V 1.0</b>
Previous Version:		-	
Page	Subjects (major changes since last revision)		
All	Updated Layout to Infineon Corporate Design, updated release to 1.0, Content unchanged!		

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## 1 Identification Byte (IDB) / Half Duplex Mode

### No Half Duplex Mode support

Some members of the C166 family do not support half duplex mode directly during bootstrap loader mode. The problem is that the receiver of the ASC0 is enabled during transmission of the IDB from the ASC0 to the host. Because of the connection of TxD0 and RxD0 (done by external hardware in half duplex mode) the IDB is received as the first byte of the 32bytes which are expected from the bootstrap loader sent by the host. In spite of this behaviour the half duplex mode can be used with the devices of the C166 family. It is only necessary to complete the IDB to an instruction (IDB instruction). This can be done in the following way:

**Table 1 IDB instructions**

Chip	IDB	additional bytes	IDB instruction
C165	B5h	4Ah, B5h, B5h	EINIT
C166	55h	RR, MM, MM	XORB op1, op2
C167	A5h	5Ah, A5h, A5h	DISWDT

This workaround reduces the number of usable bytes for a preloader from 32bytes to 28bytes because 4bytes are necessary for the 'IDB instruction'.

**Identification Byte (IDB) / Half Duplex Mode**

**Half Duplex Mode support**

For the C166 family devices which support half duplex mode the described workaround is not necessary (not allowed), because the receiver of the ASC0 is disabled during transmission of the IDB. Therefore it is possible to use half duplex mode.

**Table 2 C166 Bootstrap Loader versions**

<b>Chip</b>	<b>Step</b>	<b>IDB</b>	<b>Activation</b>	<b>Half Duplex support</b>
80C166/83C166	since CB	55h	ALE+NMI#	No
88C166	since ES1-BA	55h	ALE+NMI#	No
SAX-C167	AC	A5h	P0L.3 + NMI# (see Errata Sheet)	No
SAX-C167	AD	A5h	P0L.4	No
SAX-C167	since BA	C5h	P0L.4	Yes
SAX-C167CW	all Steps	A5h	P0L.4	No
SAX-C167S-4RM	all Steps	C5h	P0L.4	Yes
SAX-C167SR-LM	all Steps	C5h	P0L.4	Yes
SAX-C167CR-LM	all Steps	C5h	P0L.4	Yes
SAX-C167CR-16F	all Steps	C5h	P0L.4	Yes
SAX-C165	AA to BB	B5h	P0L.4	No
SAX-C165	since CA	B5h	P0L.4	Yes

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