

**Table 24-2.** Status codes for Master Transmitter Mode

Status Code (TWSR) Prescaler Bits are 0	Status of the 2-wire Serial Bus and 2-wire Serial Interface Hardware	Application Software Response					Next Action Taken by TWI Hardware
		To/from TWDR	To TWCR				
			STA	STO	TWIN T	TWE A	
0x08	A START condition has been transmitted	Load SLA+W	0	0	1	X	SLA+W will be transmitted; ACK or NOT ACK will be received
0x10	A repeated START condition has been transmitted	Load SLA+W or	0	0	1	X	SLA+W will be transmitted; ACK or NOT ACK will be received SLA+R will be transmitted; Logic will switch to Master Receiver mode
		Load SLA+R	0	0	1	X	
0x18	SLA+W has been transmitted; ACK has been received	Load data byte or	0	0	1	X	Data byte will be transmitted and ACK or NOT ACK will be received Repeated START will be transmitted STOP condition will be transmitted and TWSTO Flag will be reset STOP condition followed by a START condition will be transmitted and TWSTO Flag will be reset
		No TWDR action or	1	0	1	X	
		No TWDR action or	0	1	1	X	
0x20	SLA+W has been transmitted; NOT ACK has been received	No TWDR action	1	1	1	X	Data byte will be transmitted and ACK or NOT ACK will be received Repeated START will be transmitted STOP condition will be transmitted and TWSTO Flag will be reset STOP condition followed by a START condition will be transmitted and TWSTO Flag will be reset
		Load data byte or	0	0	1	X	
		No TWDR action or	1	0	1	X	
0x28	Data byte has been transmit- ted; ACK has been received	No TWDR action or	0	1	1	X	Data byte will be transmitted and ACK or NOT ACK will be received Repeated START will be transmitted STOP condition will be transmitted and TWSTO Flag will be reset STOP condition followed by a START condition will be transmitted and TWSTO Flag will be reset
		Load data byte or	0	0	1	X	
		No TWDR action	1	1	1	X	
0x30	Data byte has been transmit- ted; NOT ACK has been received	Load data byte or	0	0	1	X	Data byte will be transmitted and ACK or NOT ACK will be received Repeated START will be transmitted STOP condition will be transmitted and TWSTO Flag will be reset STOP condition followed by a START condition will be transmitted and TWSTO Flag will be reset
		No TWDR action or	1	0	1	X	
		No TWDR action or	0	1	1	X	
0x38	Arbitration lost in SLA+W or data bytes	No TWDR action	1	1	1	X	2-wire Serial Bus will be released and not addressed Slave mode entered A START condition will be transmitted when the bus becomes free
		No TWDR action or	0	0	1	X	
		No TWDR action	1	0	1	X	

**Table 24-3.** Status codes for Master Receiver Mode

Status Code (TWSR) Prescaler Bits are 0	Status of the 2-wire Serial Bus and 2-wire Serial Interface Hardware	Application Software Response					Next Action Taken by TWI Hardware
		To/from TWDR	To TWCR				
			STA	STO	TWIN T	TWE A	
0x08	A START condition has been transmitted	Load SLA+R	0	0	1	X	SLA+R will be transmitted ACK or NOT ACK will be received
0x10	A repeated START condition has been transmitted	Load SLA+R or	0	0	1	X	SLA+R will be transmitted ACK or NOT ACK will be received
		Load SLA+W	0	0	1	X	SLA+W will be transmitted Logic will switch to Master Transmitter mode
0x38	Arbitration lost in SLA+R or NOT ACK bit	No TWDR action or	0	0	1	X	2-wire Serial Bus will be released and not addressed Slave mode will be entered
		No TWDR action	1	0	1	X	A START condition will be transmitted when the bus becomes free
0x40	SLA+R has been transmitted; ACK has been received	No TWDR action or	0	0	1	0	Data byte will be received and NOT ACK will be returned
		No TWDR action	0	0	1	1	Data byte will be received and ACK will be returned
0x48	SLA+R has been transmitted; NOT ACK has been received	No TWDR action or	1	0	1	X	Repeated START will be transmitted
		No TWDR action or	0	1	1	X	STOP condition will be transmitted and TWSTO Flag will be reset
		No TWDR action	1	1	1	X	STOP condition followed by a START condition will be transmitted and TWSTO Flag will be reset
0x50	Data byte has been received; ACK has been returned	Read data byte or	0	0	1	0	Data byte will be received and NOT ACK will be returned
		Read data byte	0	0	1	1	Data byte will be received and ACK will be returned
0x58	Data byte has been received; NOT ACK has been returned	Read data byte or	1	0	1	X	Repeated START will be transmitted
		Read data byte or	0	1	1	X	STOP condition will be transmitted and TWSTO Flag will be reset
		Read data byte	1	1	1	X	STOP condition followed by a START condition will be transmitted and TWSTO Flag will be reset

**Table 24-4.** Status Codes for Slave Receiver Mode

Status Code (TWSR) Prescaler Bits are 0	Status of the 2-wire Serial Bus and 2-wire Serial Interface Hard- ware	Application Software Response					Next Action Taken by TWI Hardware
		To/from TWDR	To TWCR				
			STA	STO	TWINT	TWEA	
0x60	Own SLA+W has been received; ACK has been returned	No TWDR action or	X	0	1	0	Data byte will be received and NOT ACK will be returned
		No TWDR action	X	0	1	1	Data byte will be received and ACK will be returned
0x68	Arbitration lost in SLA+R/W as Master; own SLA+W has been received; ACK has been returned	No TWDR action or	X	0	1	0	Data byte will be received and NOT ACK will be returned
		No TWDR action	X	0	1	1	Data byte will be received and ACK will be returned
0x70	General call address has been received; ACK has been returned	No TWDR action or	X	0	1	0	Data byte will be received and NOT ACK will be returned
		No TWDR action	X	0	1	1	Data byte will be received and ACK will be returned
0x78	Arbitration lost in SLA+R/W as Master; General call address has been received; ACK has been re- turned	No TWDR action or	X	0	1	0	Data byte will be received and NOT ACK will be returned
		No TWDR action	X	0	1	1	Data byte will be received and ACK will be returned
0x80	Previously addressed with own SLA+W; data has been received; ACK has been returned	Read data byte or	X	0	1	0	Data byte will be received and NOT ACK will be returned
		Read data byte	X	0	1	1	Data byte will be received and ACK will be returned
0x88	Previously addressed with own SLA+W; data has been received; NOT ACK has been returned	Read data byte or	0	0	1	0	Switched to the not addressed Slave mode; no recognition of own SLA or GCA
		Read data byte or	0	0	1	1	Switched to the not addressed Slave mode; own SLA will be recognized; GCA will be recognized if TWGCE = "1"
		Read data byte or	1	0	1	0	Switched to the not addressed Slave mode; no recognition of own SLA or GCA; a START condition will be transmitted when the bus becomes free
		Read data byte	1	0	1	1	Switched to the not addressed Slave mode; own SLA will be recognized; GCA will be recognized if TWGCE = "1"; a START condition will be transmitted when the bus becomes free
0x90	Previously addressed with gener- al call; data has been received; ACK has been returned	Read data byte or	X	0	1	0	Data byte will be received and NOT ACK will be returned
		Read data byte	X	0	1	1	Data byte will be received and ACK will be returned
0x98	Previously addressed with gener- al call; data has been received; NOT ACK has been returned	Read data byte or	0	0	1	0	Switched to the not addressed Slave mode; no recognition of own SLA or GCA
		Read data byte or	0	0	1	1	Switched to the not addressed Slave mode; own SLA will be recognized; GCA will be recognized if TWGCE = "1"
		Read data byte or	1	0	1	0	Switched to the not addressed Slave mode; no recognition of own SLA or GCA; a START condition will be transmitted when the bus becomes free
		Read data byte	1	0	1	1	Switched to the not addressed Slave mode; own SLA will be recognized; GCA will be recognized if TWGCE = "1"; a START condition will be transmitted when the bus becomes free
0xA0	A STOP condition or repeated START condition has been re- ceived while still addressed as Slave	No action	0	0	1	0	Switched to the not addressed Slave mode; no recognition of own SLA or GCA
			0	0	1	1	Switched to the not addressed Slave mode; own SLA will be recognized; GCA will be recognized if TWGCE = "1"
			1	0	1	0	Switched to the not addressed Slave mode; no recognition of own SLA or GCA; a START condition will be transmitted when the bus becomes free
			1	0	1	1	Switched to the not addressed Slave mode; own SLA will be recognized; GCA will be recognized if TWGCE = "1"; a START condition will be transmitted when the bus becomes free

**Table 24-5.** Status Codes for Slave Transmitter Mode

Status Code (TWSR) Prescaler Bits are 0	Status of the 2-wire Serial Bus and 2-wire Serial Interface Hard- ware	Application Software Response					Next Action Taken by TWI Hardware
		To/from TWDR	To TWCR				
			STA	STO	TWINT	TWEA	
0xA8	Own SLA+R has been received; ACK has been returned	Load data byte or	X	0	1	0	Last data byte will be transmitted and NOT ACK should be received
		Load data byte	X	0	1	1	Data byte will be transmitted and ACK should be re- ceived
0xB0	Arbitration lost in SLA+R/W as Master; own SLA+R has been re- ceived; ACK has been returned	Load data byte or	X	0	1	0	Last data byte will be transmitted and NOT ACK should be received
		Load data byte	X	0	1	1	Data byte will be transmitted and ACK should be re- ceived

**Table 24-5. Status Codes for Slave Transmitter Mode (Continued)**

0xB8	Data byte in TWDR has been transmitted; ACK has been received	Load data byte or Load data byte	X X	0 0	1 1	0 1	Last data byte will be transmitted and NOT ACK should be received Data byte will be transmitted and ACK should be received
0xC0	Data byte in TWDR has been transmitted; NOT ACK has been received	No TWDR action or No TWDR action or No TWDR action or No TWDR action	0 0 1 1	0 0 0 0	1 1 1 1	0 1 0 1	Switched to the not addressed Slave mode; no recognition of own SLA or GCA Switched to the not addressed Slave mode; own SLA will be recognized; GCA will be recognized if TWGCE = "1" Switched to the not addressed Slave mode; no recognition of own SLA or GCA; a START condition will be transmitted when the bus becomes free Switched to the not addressed Slave mode; own SLA will be recognized; GCA will be recognized if TWGCE = "1"; a START condition will be transmitted when the bus becomes free
0xC8	Last data byte in TWDR has been transmitted (TWEA = "0"); ACK has been received	No TWDR action or No TWDR action or No TWDR action or No TWDR action	0 0 1 1	0 0 0 0	1 1 1 1	0 1 0 1	Switched to the not addressed Slave mode; no recognition of own SLA or GCA Switched to the not addressed Slave mode; own SLA will be recognized; GCA will be recognized if TWGCE = "1" Switched to the not addressed Slave mode; no recognition of own SLA or GCA; a START condition will be transmitted when the bus becomes free Switched to the not addressed Slave mode; own SLA will be recognized; GCA will be recognized if TWGCE = "1"; a START condition will be transmitted when the bus becomes free