



# ABB

## The Company

We are an established world force in the design and manufacture of instrumentation for industrial process control, flow measurement, gas and liquid analysis and environmental applications.

As a part of ABB, a world leader in process automation technology, we offer customers application expertise, service and support worldwide.

We are committed to teamwork, high quality manufacturing, advanced technology and unrivalled service and support.

The quality, accuracy and performance of the Company's products result from over 100 years experience, combined with a continuous program of innovative design and development to incorporate the latest technology.

The UKAS Calibration Laboratory No. 0255 is just one of the ten flow calibration plants operated by the Company and is indicative of our dedication to quality and accuracy.

EN ISO 9001:2000



Cert. No. Q 05907

EN 29001 (ISO 9001)



Lenno, Italy – Cert. No. 9/90A

Stonehouse, U.K.



## Electrical Safety

This equipment complies with the requirements of CEI/IEC 61010-1:2001-2 'Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use'. If the equipment is used in a manner NOT specified by the Company, the protection provided by the equipment may be impaired.

## Symbols

One or more of the following symbols may appear on the equipment labelling:

|  |   |  |  |
|--|---|--|--|
|  | <b>Warning</b> – Refer to the manual for instructions |  | Direct current supply only                           |
|  | <b>Caution</b> – Risk of electric shock               |  | Alternating current supply only                      |
|  | Protective earth (ground) terminal                    |  | Both direct and alternating current supply           |
|  | Earth (ground) terminal                               |  | The equipment is protected through double insulation |

Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of the Technical Publications Department.

### Health and Safety

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.
4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
5. Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
6. When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares information.

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# 1 Introduction

**Note.** This Supplementary User Guide contains information specific to Profibus DP-enabled Navigator 600 Series analyzers and must be read in conjunction with the User Guide relevant to each model.

## 1.1 Profibus

Profibus is a manufacturer-independent, open fieldbus standard for a wide range of applications in manufacturing, process and building automation. Manufacturer independence and openness are ensured by the international standard EN 50170.

Using the Profibus protocol, devices from different manufacturers exchange information on the same communications bus without the need for special interface equipment.

The Profibus family comprises three types of protocol, Profibus DP, Profibus FMS and Profibus PA, each of which is used for different tasks. Of these three protocols, the most important for process automation are Profibus DP and Profibus PA.

Further information on Profibus can be found at [www.profibus.com](http://www.profibus.com).

### 1.1.1 Profibus DP

Profibus DP is designed for high-speed data exchange and is commonly used by complex or externally-powered devices. The central controller or 'master' device (e.g. PLC or PC) utilizes Profibus DP as a fast serial connection with distributed (slave) field devices such as Profibus-enabled Navigator 600 Series analyzers.

DP-V0 is the basic stage of the Profibus DP communication protocol. DP-V0 provides cyclic data exchange between master and slave devices.

The Navigator 600 Series analyzers also support the DP-V1 extension that enables additional acyclic communication between master and slave devices.

### 1.1.2 Profibus PA

Profibus PA is designed to accommodate process automation field devices that require power via the network with the option to use intrinsic safety for hazardous areas. Typical devices using this protocol include transmitters and positioners.

A DP/PA coupler or link device is used to connect the Profibus PA network to the Profibus DP network.

## 1.2 Profibus and ABB Products

Navigator 600 Series analyzers utilize Profibus DP as this is the protocol optimized for high speed and low connection costs (see [www.abb.com/fieldbus](http://www.abb.com/fieldbus) and follow the [Profibus](#) link).

### 1.3 Profibus DP Transmission Technology

The transfer method of Profibus DP is RS485 – a proven technology. A twisted, shielded, two-wire copper cable is used as the transfer medium.

The bus structure enables addition and removal of stations or step-by-step commissioning of the system without affecting other stations. Later expansion has no influence on stations already in operation.

Transmission speeds of between 9.6 kbit/sec and 12 Mbit/sec are available. One uniform transmission speed is selected for all devices on the bus when the system is commissioned.

## 2 Installation

### 2.1 Installation Overview – Fig. 2.1

All devices are connected in a bus structure ('line'). Up to 32 stations (master or slaves) can be linked to create one 'segment'.

Each end of a segment must be terminated by an active bus terminating resistor. Both bus terminators must always be powered to ensure fault-free operation therefore it is strongly recommended that they are connected to a back-up power supply.

Up to three line bus amplifiers (repeaters) can be used to extend the network to a total of four segments, allowing a maximum of 125 devices to be installed in the system.

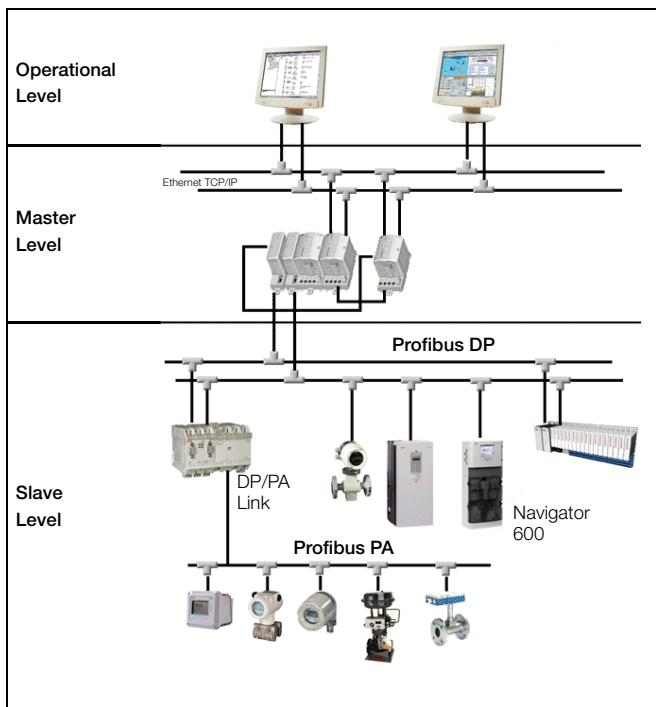


Fig. 2.1 Typical Profibus Network

### 2.2 Cable Length

The maximum cable length of a segment is determined by the transmission speed – see Table 2.1. The cable length specified can be extended by using repeaters but it is recommended that no more than three repeaters are connected in series.

| Transmission Rate (bits/sec) | Maximum Segment Length (m) | Maximum Total Network Length (m) |
|------------------------------|----------------------------|----------------------------------|
| 9.6 to 93.75k                | 1200                       | 4800                             |
| 187.5k                       | 1000                       | 4000                             |
| 500k                         | 400                        | 1600                             |
| 1.5M                         | 200                        | 800                              |
| 3 to 12M                     | 100                        | 400                              |

Table 2.1 Cable Length

### 2.3 Cable Specification

The cable lengths in Table 2.1 refer to the following cable type:

|                             |                      |
|-----------------------------|----------------------|
| Characteristic impedance    | 135 to 165Ω          |
| Capacitance per unit length | <30 pf/m             |
| Loop resistance             | 110Ω/km              |
| Core diameter               | 0.64mm               |
| Core cross section          | >0.34mm <sup>2</sup> |

Suitable Profibus cable, part nos. PCA010, PCA 011 and PCA 012, can be obtained from ABB. Refer to Data Sheet 10/63-6.46 EN.

### 2.4 Device Integration – the GSD File

Profibus devices differ with respect to available functionality and parameters and these vary individually for each device type and manufacturer. In order to obtain 'Plug-and-Play' configuration for Profibus, characteristic device communication features such as manufacturer name, device name, hardware/software versions, baud rate and the number and nature of inputs/outputs are defined in an electronic device data sheet known as a GSD file.

A GSD file is readable ASCII text file that contains both general and device-specific specifications for communication. Each of the entries describes a feature supported by a device. By the means of keywords, a configuration tool reads the device identification, the adjustable parameters, the corresponding data type and the permitted limit values for the configuration of the device from the GSD. Some keywords are mandatory, e.g. Vendor\_Name; others are optional, e.g. Sync\_Mode\_supported.

The GSD file (ABB\_OAD4\_1001.gsd) for Profibus-enabled Navigator 600 Series analyzers conforms to the Profibus standard.

### 3 Network Connection and Configuration

**Warning.** When connecting a Profibus-enabled Navigator 600 Series analyzer to a Profibus-DP network:

- Use shielded data lines and ensure they are not reversed.
- Ensure all data lines are routed clear of the source of any strong electrical and magnetic fields.
- Refer to the User Guide for all other installation and connection details.

#### 3.1 Network Connections – Fig. 3.1

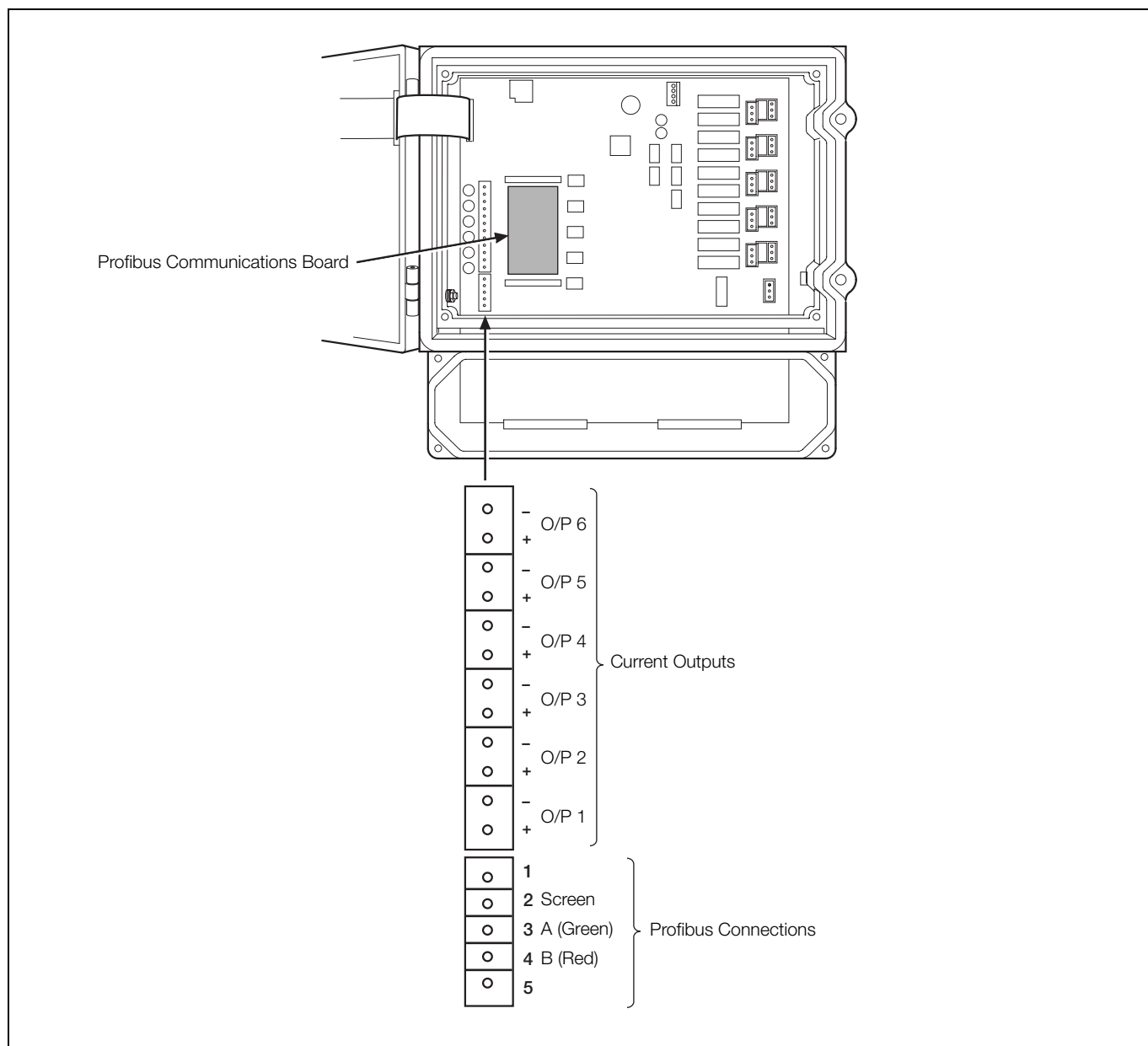
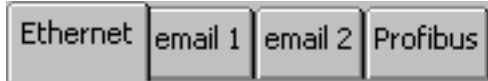


Fig. 3.1 Network Cable Connections

### 3.2 Network Configuration

**Note.** A Navigator 600 Series analyzer is not configured using Profibus commands but via the analyzer's keypad and menu system.

To configure Profibus communications, refer to Section 11.6 of the User Guide relevant to the analyzer model and access the Profibus tab:



| Fields        | Description  |
|---------------|--|
| Slave Address | A unique identifying number for the analyzer from 1 to 126.<br>A default address of 6 is set in the factory before shipping. This address can be changed to any value from 1 to 125 to enable the analyzer to be visible on a Profibus system. |

## Appendix A – GSD File Module

### Note.

- Float = Floating-point number – requires 4 bytes
- Char = Character – requires 1 byte
- Int = Integer – requires 2 bytes

### A.1 Module 01

Table A.1 defines the Module 01 data available from a Navigator 600 Series analyzer via Profibus cyclic transfer:

| Byte     | Type  | Description     |
|----------|-------|-----------------|
| 1 to 4   | Float | Stream 1 value  |
| 5        | Char  | Stream 1 status |
| 6 to 9   | Float | Stream 2 value  |
| 10       | Char  | Stream 2 status |
| 11 to 14 | Float | Stream 3 value  |
| 15       | Char  | Stream 3 status |
| 16 to 19 | Float | Stream 4 value  |
| 20       | Char  | Stream 4 status |
| 21 to 24 | Float | Stream 5 value  |
| 25       | Char  | Stream 5 status |
| 26 to 29 | Float | Stream 6 value  |
| 30       | Char  | Stream 6 status |

Table A.1 Module 01 Data

### A.2 Status Byte Definition

Table A.2 defines the meaning of the contents of a Navigator 600 Series analyzer's status byte.

| Byte (Hex) | Definition                           |
|------------|--------------------------------------|
| 1C         | OOS (Out of Service)                 |
| 80         | Good                                 |
| 89         | Low alarm limit advisory alarm       |
| 8A         | High alarm limit advisory alarm      |
| 8D         | Low-low alarm limit critical alarm   |
| 8E         | High-high alarm limit critical alarm |

Table A.2 Status Byte Definition

## Appendix B – Acyclic Parameter Mapping

### <sup>2</sup>Access Definitions:

R – Read only.  
R/W – Read/Write.

<sup>1</sup>Store Definitions: C = Constant – the value held in a Navigator 600 Series analyzer does not change  
D = Dynamic – a value or state calculated by a Navigator 600 Series analyzer

N = Non-volatile – typically a configuration parameter that is stored in a Navigator 600 Series analyzer's non-volatile memory

| Description                             | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default                                | Valid Range                 | Note  |
|---|------|------------|-------------|---------------|-------|--------------------|---------------------|--|-----------------------------|---|
| <b>Physical Block Parameters</b>        |      |            |             |               |       |                    |                     |  |                             |   |
| Software revision                       | 0    | 24         | Simple      | VisibleString | 16    | C                  | R                   | Current revision                       | ASCII string                | Low level version number                                |
| Hardware revision                       | 0    | 25         | Simple      | VisibleString | 16    | C                  | R                   | Current revision                       | ASCII string                |   |
| Manufacturer identification             | 0    | 26         | Simple      | Unsigned16    | 2     | C                  | R                   | 26 (ABB)                               |                             |   |
| Device identification                   | 0    | 27         | Simple      | VisibleString | 16    | C                  | R                   | AW641 SiO2<br>AW642 – PO4<br>AW642 – P |                             |   |
| Device serial number                    | 0    | 28         | Simple      | VisibleString | 16    | C                  | R                   | Unit's serial number                   | ASCII string                |   |
| Device diagnosis information            | 0    | 29         | Simple      | OctetString   | 4     | D                  | R                   |  |                             | See Table B.2, page 45                                  |
| Additional device diagnosis information | 0    | 30         | Simple      | OctetString   | 6     | D                  | R                   |  |                             | Navigator 600 specific errors<br>See Table B.2, page 45 |
| Diagnosis definition                    | 0    | 31         | Simple      | OctetString   | 4     | C                  | R                   |  |                             | See Table B.2, page 45                                  |
| Extended diagnosis definition           | 0    | 32         | Simple      | OctetString   | 6     | C                  | R                   |  |                             | See Table B.2, page 45                                  |
| Device certification                    | 0    | 33         | Simple      | VisibleString | 32    | C                  | R                   |  |                             |   |
| Number of streams fitted                | 0    | 64         | Simple      | Unsigned8     | 1     | N                  | R                   |  | 1 to 6                      |   |
| Instrument tag                          | 0    | 65         | Simple      | VisibleString | 20    | N                  | R/W                 | Navigator 600                          | ASCII string                |   |
| HMI software revision                   | 0    | 66         | Simple      | VisibleString | 16    | C                  | R                   | Current revision                       | ASCII string                |   |
| OS software revision                    | 0    | 67         | Simple      | VisibleString | 16    | C                  | R                   | Current revision                       | ASCII string                |   |
| Instrument type                         | 0    | 68         | Simple      | Unsigned8     | 1     | C                  | R                   | 0                                      | 0 = Silica<br>1 = Phosphate |   |

Table B.1 Data Structure (Sheet 1 of 38)

| Description                        | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default     | Valid Range   | Note  |
|------------------------------------|------|------------|-------------|------------|-------|--------------------|---------------------|-------------|---|---|
| <b>Transducer Block Parameters</b> |      |            |             |            |       |                    |                     |             |   |   |
| Enable streams                     | 1    | 145        | Array       | Unsigned8  | 6     | N                  | RW                  |             | 0= disabled<br>1 = enabled  |   |
| Stream sequence                    | 1    | 146        | Array       | Unsigned8  | 12    | N                  | RW                  | 1,2,3,4,5,6 | 1 to 6  |   |
| Sample Interval                    | 1    | 147        | Simple      | Unsigned16 | 2     | N                  | RW                  |             | 0 = continuous  |   |
| Up scale sample time               | 1    | 148        | Simple      | Unsigned8  | 1     | N                  | RW                  |             | 10 to 30 minutes  |   |
| Down scale sample time             | 1    | 149        | Simple      | Unsigned8  | 1     | N                  | RW                  |             | 10 to 30 minutes  |   |
| Zero calibration time              | 1    | 150        | Simple      | Unsigned16 | 2     | N                  | RW                  |             | 10 to 60 minutes  |   |
| Secondary calibration time         | 1    | 151        | Simple      | Unsigned16 | 2     | N                  | RW                  |             | 10 to 60 minutes  |   |
| Recovery time                      | 1    | 152        | Simple      | Unsigned16 | 2     | N                  | RW                  |             | 10 to 60 minutes  |   |
| Calibration factor limit           | 1    | 153        | Simple      | Unsigned16 | 2     | N                  | RW                  |             | 15 to 50 (value x100)   | 0.15 to 0.5   |
| Calibration offset limit           | 1    | 154        | Simple      | Unsigned16 | 2     | N                  | RW                  |             | SiO2 = 50 to 500<br>PO4 = 2 to 200 (value x100)<br>P = 0 to 65 (value x100) | SiO2 = 50 to 500<br>PO4 = 0.02 to 20.00<br>P = 0.00 to 0.65 |
| Sample pump speed                  | 1    | 155        | Simple      | Unsigned16 | 2     | N                  | RW                  |             | 1 to 20 (value x 10)  | 0.1 to 2.0  |
| Reagent pump speed                 | 1    | 156        | Simple      | Unsigned16 | 2     | N                  | RW                  |             | 1 to 20 (value x10)   | 0.1 to 2.0  |
| Sample heater proportional band    | 1    | 157        | Simple      | Unsigned16 | 2     | N                  | RW                  |             | 1 to 9999 (%value x 10)   | 0.1 to 999.9%   |
| Sample heater integral time        | 1    | 158        | Simple      | Unsigned16 | 2     | N                  | RW                  |             | 0 to 9999 seconds   |   |
| Sample heater cycle time           | 1    | 159        | Simple      | Unsigned16 | 2     | N                  | RW                  |             | 1 to 9999 (value in seconds x 10)   | 0.1 to 999.9s   |
| Reagent bottle type                | 1    | 160        | Simple      | Unsigned8  | 1     | N                  | RW                  | 0           | 0 = Standard<br>1 = Custom  |   |
| Reagent bottle capacity            | 1    | 161        | Simple      | Unsigned16 | 2     | N                  | RW                  | 250         | 10 to 1000 litres (x 100)   | 0.1 to 10.0 litres – bottle type must be 'Custom' to change |
| Reagent limit                      | 1    | 162        | Simple      | Unsigned16 | 2     | N                  | RW                  | 7           | 1 to 30 days  |   |
| Cal solution limit                 | 1    | 163        | Simple      | Unsigned16 | 2     | N                  | RW                  | 3           | 1 to 30 calibrations  |   |
| Cleaning solution limit            | 1    | 164        | Simple      | Unsigned16 | 2     | N                  | RW                  | 3           | 1 to 30 cleaning cycles   |   |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 2 of 38)

| Description                          | Slot | Slot Index | Object Type | Data Type | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range   | Note  |
|--------------------------------------|------|------------|-------------|-----------|-------|--------------------|---------------------|---------|---|---|
| Secondary calibration value          | 1    | 165        | Simple      | Float     | 4     | N                  | RW                  | 50 ppb  | 0 to 5000 silica<br>0 to 10 phosphate                                 |   |
| Baseline calibration enable          | 1    | 166        | Simple      | Unsigned8 | 1     | N                  | RW                  | 0       | 0 = Disabled (Stop)<br>1 = Enabled                                    |   |
| Zero + secondary calibration enable  | 1    | 167        | Simple      | Unsigned8 | 1     | N                  | RW                  | 0       | 0 = Disabled (Stop)<br>1 = Enabled                                    |   |
| Zero calibration enable              | 1    | 168        | Simple      | Unsigned8 | 1     | N                  | RW                  | 0       | 0 = Disabled (Stop)<br>1 = Enabled                                    |   |
| Secondary calibration enable         | 1    | 169        | Simple      | Unsigned8 | 1     | N                  | RW                  | 0       | 0 = Disabled (Stop)<br>1 = Enabled                                    |   |
| Calibration offset                   | 1    | 170        | Simple      | Float     | 4     | D                  | R                   | 0.0     |   | Displayed to 1 decimal place                  |
| Calibration factor                   | 1    | 171        | Simple      | Float     | 4     | D                  | R                   | 1.00    |   | Displayed to 2 decimal places                 |
| Reset calibration offset & factor    | 1    | 172        | Simple      | Unsigned8 | 1     |                    | RW                  | 0       | 1 = Reset   |   |
| Configuration mode                   | 1    | 173        | Simple      | Unsigned8 | 1     |                    | RW                  | 0       |   | Reads 1 when in 'Profibus' config otherwise 0 |
| Reagent level 1                      | 1    | 174        | Simple      | Unsigned8 | 1     | D                  | R                   | 0       | Days remaining – no decimal places                                    |   |
| Reagent level 2                      | 1    | 175        | Simple      | Unsigned8 | 1     | D                  | R                   | 0       | Days remaining – no decimal places                                    |   |
| Reagent level 3                      | 1    | 176        | Simple      | Unsigned8 | 1     | D                  | R                   | 0       | Days remaining – no decimal places                                    |   |
| Reagent level 4                      | 1    | 177        | Simple      | Unsigned8 | 1     | D                  | R                   | 0       | Days remaining – no decimal places                                    |   |
| Secondary calibration solution level | 1    | 178        | Simple      | Unsigned8 | 1     | D                  | R                   | 0       | Calibrations remaining  |   |
| Zero calibration solution level      | 1    | 179        | Simple      | Unsigned8 | 1     | D                  | R                   | 0       | Calibrations remaining  |   |
| Cleaning solution level              | 1    | 180        | Simple      | Unsigned8 | 1     | D                  | R                   | 0       | Cleaning cycles remaining   |   |
| Language                             | 1    | 181        | Simple      | Unsigned8 | 1     |                    | R                   | 0       | 0 = English<br>1 = German<br>2 = French<br>3 = Italian<br>4 = Spanish |   |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 3 of 38)

| Description        | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range   | Note                            |
|--------------------|------|------------|-------------|------------|-------|--------------------|---------------------|---------|---|---------------------------------|
| Level sensors      | 1    | 182        | Simple      | Unsigned8  | 1     |                    | R                   | 0       | 0 = Disabled<br>1 = Enabled                                   |                                 |
| Flow sensors       | 1    | 183        | Simple      | Unsigned8  | 1     |                    | R                   | 0       | 0 = Disabled<br>1 = Enabled                                   |                                 |
| Update time        | 1    | 184        | Simple      | Unsigned16 | 2     |                    | RW                  | 15      | 1 to 20   |                                 |
| Automatic schedule | 1    | 185        | Record      |            | 21    |                    | RW                  |         |   |                                 |
|                    |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Off<br>1 to 7 = 1 to 7 days                               | Zero calibration frequency      |
|                    |      |            | Simple      | Unsigned16 | 2     |                    |                     |         | Year  | Next zero date & time           |
|                    |      |            | Array       | Unsigned8  | 4     |                    |                     |         | Month<br>Day<br>Hour<br>Minute                                |                                 |
|                    |      |            | Simple      | Unsigned8  | 1     |                    |                     |         | 0 = Off<br>1 to 7 = 1 to 7 days<br>8 = 2 weeks<br>9 = 4 weeks | Secondary calibration frequency |
|                    |      |            | Simple      | Unsigned16 | 2     |                    |                     |         | Year  | Next secondary date             |
|                    |      |            | Array       | Unsigned8  | 4     |                    |                     |         | Month<br>Day<br>Hour<br>Minute                                | Time from zero                  |
|                    |      |            | Simple      | Unsigned8  | 1     |                    |                     |         | 0 = Off<br>1 to 7 = 1 to 7 days<br>8 = 2 weeks<br>9 = 4 weeks | Clean frequency                 |
|                    |      |            | Simple      | Unsigned16 | 2     |                    |                     |         | Year  | Next clean date                 |
|                    |      |            | Array       | Unsigned8  | 4     |                    |                     |         | Month<br>Day<br>Hour<br>Minute                                | Time from zero                  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 4 of 38)

| Description         | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range   | Note  |
|---------------------|------|------------|-------------|------------|-------|--------------------|---------------------|---------|---|---|
| Clean durations     | 1    | 186        | Array       | Unsigned16 | 4     |                    | RW                  | 20, 20  | 20, 30, 60 mins<br>2, 4, 6, 8, 12 hours   | Automatic and manual clean durations  |
| Valve & pump status | 1    | 187        | Array       | Unsigned8  | 11    |                    | R                   |         |   | Streams 1 to 6.<br>Zero, secondary & clean valves.<br>Sample & reagent pumps. |
| Mode of operation   | 1    | 189        | Simple      | Unsigned8  | 1     |                    | R                   | 0       | 0 = Normal<br>1 = Demonstration<br>2 = Test   |   |
| Archive definition  | 1    | 190        | Record      |            | 6     |                    | RW                  |         |   |   |
|                     |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Text<br>1 = Binary  | Archive format  |
|                     |      |            | Array       | Unsigned8  | 3     |                    |                     | 0, 0, 0 | Data, alarm event and audit logs<br>0 = Off<br>1 = On   | Archive enable  |
|                     |      |            | Simple      | Unsigned8  | 1     |                    |                     | 2       | 0 = Off<br>1 = Hour<br>2 = Day<br>3 = Month   | New file interval   |
|                     |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Off<br>1 = On   | File wrapping   |
| Filter type         | 1    | 191        | Simple      | Unsigned8  | 1     |                    | RW                  | 0       | 0 = Instantaneous<br>2 = Average<br>3 = Minimum only<br>4 = Maximum only<br>5 = Minimum & Maximum |   |
| Sample rate         | 1    | 192        | Simple      | Unsigned32 | 4     |                    | RW                  | 10000   | 1000 to 43200000  | Sample rate in ms   |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 5 of 38)

| Description           | Slot | Slot Index | Object Type | Data Type | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range  | Note                  |
|-----------------------|------|------------|-------------|-----------|-------|--------------------|---------------------|---------|--|-----------------------|
| Chart view definition | 1    | 193        | Record      |           | 7     |                    | RW                  |         |  |                       |
|                       |      |            | Simple      | Unsigned8 | 1     |                    |                     | 1       | 0 = Horizontal<br>1 = Reversed Horizontal<br>2 = Vertical  | Chart type            |
|                       |      |            | Simple      | Unsigned8 | 1     |                    |                     | 0       | 0 = None<br>1 = Alarms<br>2 = Alarms & Messages  | View annotation       |
|                       |      |            | Simple      | Unsigned8 | 1     |                    |                     | 5       | 1 to 10  | Major chart divisions |
|                       |      |            | Simple      | Unsigned8 | 1     |                    |                     | 2       | 1 to 10  | Minor chart divisions |
|                       |      |            | Simple      | Unsigned8 | 1     |                    |                     | 1       | 0 = Off<br>1 = On  | Trace pointers        |
|                       |      |            | Simple      | Unsigned8 | 1     |                    |                     | 8       | 0 = 18 seconds<br>1 = 90 seconds<br>2 = 3 minutes<br>3 = 6 minutes<br>4 = 9 minutes<br>5 = 12 minutes<br>6 = 15 minutes<br>7 = 30 minutes<br>8 = 1 hour<br>9 = 4 hours<br>10 = 8 hours<br>11 = 12 hours<br>12 = 1 day<br>13 = 2 days<br>14 = 3 days<br>15 = 7 days | Screen interval       |
|                       |      |            | Simple      | Unsigned8 | 1     |                    |                     | 1       | 1 to 3   | Trace width           |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 6 of 38)

| Description            | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default       | Valid Range  | Note   |
|------------------------|------|------------|-------------|------------|-------|--------------------|---------------------|---------------|--|--|
| Chemical units         | 1    | 194        | Simple      | Unsigned8  | 1     |                    | R/W                 | 0             | 0 = PO4<br>1 = P   | Used only for phosphate  |
| Control temperature    | 1    | 195        | Simple      | Float      | 4     |                    | R/W                 | 45            | 10 to 50   |  |
| Screen saver wait time | 1    | 196        | Simple      | Unsigned8  | 1     |                    | R/W                 | 0             | 0 = Disabled<br>1 = 5 minutes<br>2 = 15 minutes<br>3 = 30 minutes<br>4 = 1 hour<br>5 = 2 hours<br>6 = 4 hours<br>7 = 1 day |  |
| Screen capture         | 1    | 197        | Simple      | Unsigned8  | 1     |                    | R/W                 | 0             | 0 = Disabled<br>1 = Enabled  |  |
| Brightness             | 1    | 198        | Simple      | Unsigned8  | 1     |                    | R                   | 60            | 0 to 100   |  |
| Date & time            | 1    | 199        | Record      |            | 7     |                    | R/W                 |               |  |  |
|                        |      |            | Simple      | Unsigned16 | 2     |                    |                     | 2000          | Year   |  |
|                        |      |            | Array       | Unsigned8  | 5     |                    |                     | 1, 1, 0, 0, 0 | Month<br>Day<br>Hour<br>Minute<br>Second   |  |
| Day/light saving       | 1    | 200        | Record      |            | 9     |                    | R/W                 |               |  |  |
|                        |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0             | 0 = Off<br>1 = USA<br>2 = Europe<br>3 = Custom   | Start and end dates used for custom  |
|                        |      |            | Array       | Unsigned8  | 4     |                    |                     | 2, 5, 1, 3    | Hour<br>Occurrence<br>Day of week 1 = Sun<br>Month 1 = Jan   | Occurrence is 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> or last occurrence of the day in the month |
|                        |      |            | Array       | Unsigned8  | 4     |                    |                     | 2, 5, 1, 10   | Hour<br>Occurrence<br>Day of week 1 = Sun<br>Month 1 = Jan   |  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 7 of 38)

| Description                               | Slot                    | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default   | Valid Range  | Note   |
|---|-------------------------|------------|-------------|------------|-------|--------------------|---------------------|-----------|--|--|
| <b>Stream 1 Function Block Parameters</b> |                         |            |             |            |       |                    |                     |           |  |  |
| Stream 1 output                           | 1                       | 26         | Record      | DS-33      | 5     | D                  | Cyclic / R          |           |  |  |
| Output scale                              | 1                       | 28         | Record      | DS-36      | 11    | S                  | RW                  |           |  |  |
|   | High range              |            | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Low range               |            | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Units                   |            | Simple      | Unsigned16 | 2     | S                  | RW                  | ppb       | 1423 = ppm<br>1424 = ppb<br>1558 = mg/l<br>1559 = ug/l<br>1521 = ug/kg<br>1522 = mg/kg | Common units setting for all streams.<br>SiO2 = ppb, ug/l only<br>PO4 & P = ppm, mg/l & mg/kg only |
|   | Decimal point           |            | Simple      | Integer8   | 1     | S                  | RW                  | 0         | 0 or 1   |  |
| Alarm hysteresis                          | 1                       | 35         | Simple      | Float      | 4     | S                  | RW                  | 0         |  |  |
| High-high alarm limit                     | 1                       | 37         | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  |  |  |
| High alarm limit                          | 1                       | 39         | Simple      | Float      | 4     | S                  | RW                  | 50000 ppb |  |  |
| Low alarm limit                           | 1                       | 41         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Low-low alarm limit                       | 1                       | 43         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Simulate                                  | 1                       | 50         | Record      | DS-50      | 6     | S                  | RW                  |           |  | Affects only the Profibus output and not the value displayed on the analyzer's display             |
|   | Simulate status         |            |             | Unsigned8  | 1     | S                  | RW                  | 0 x 80    |  |  |
|   | Simulate value          |            |             | Float      | 4     | S                  | RW                  | 0         |  |  |
|   | Simulate enable/disable |            |             | Unsigned8  | 1     | S                  | RW                  | 0         | 0 = Disabled<br>Not 0 = Enabled  |  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 8 of 38)

| Description         | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range  | Note                                    |
|---------------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|--|---|
| Stream 1 tag        | 1    | 61         | Simple      | OctetString   | 20    | S                  | RW                  | Spaces  |  | Tag displayed on the analyzer's display |
| Stream 1 statistics | 1    | 62         | Record      |               | 12    |                    | R                   |         |  |   |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Maximum                                 |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Minimum                                 |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Average                                 |
| Alarm relay 1       | 1    | 63         | Record      |               | 24    |                    | RW                  |         |  |   |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = Off<br>1 to 6 = Stream number<br>7 = Clearing  | Alarm source                            |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 1 = High process<br>2 = Low process<br>3 = High latch<br>4 = Low latch<br>5 = High annunciate<br>6 = Low annunciate<br>7 = Out of sample | Alarm type                              |
|                     |      |            | Simple      | VisibleString | 20    |                    |                     | Alarm A | ASCII string   |   |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Fail safe                               |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Log enable                              |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 9 of 38)

| Description          | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range                        | Note                                    |
|----------------------|------|------------|-------------|------------|-------|--------------------|---------------------|---------|------------------------------------|---|
| Current output 1     | 1    | 64         | Record      |            | 13    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = None<br>1 to 6 = Stream 1 to 6 | Output source                           |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 2000    | 0 to 5000                          | Output range high                       |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 0       | 0 to 5000                          | Output range low                        |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 4000    | 0 to 22000                         | Output type low * 1000                  |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 20000   | 0 to 22000                         | Output type high * 1000                 |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Calibration hold                        |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Out of sample indication                |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 22000   | 0 to 22000                         | Default output *1000 when out of sample |
| Alarm relay 1 limits | 1    | 65         | Record      |            | 12    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Trip                                    |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Hysteresis                              |
|                      |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 to 5000                          | Time hysteresis                         |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 10 of 38)

| Description                               | Slot                    | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default   | Valid Range  | Note   |
|---|-------------------------|------------|-------------|------------|-------|--------------------|---------------------|-----------|--|--|
| <b>Stream 2 Function Block Parameters</b> |                         |            |             |            |       |                    |                     |           |  |  |
| Stream 2 output                           | 2                       | 26         | Record      | DS-33      | 5     | D                  | Cyclic / R          |           |  |  |
| Output scale                              | 2                       | 28         | Record      | DS-36      | 11    | S                  | RW                  |           |  |  |
|   | High range              |            | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Low range               |            | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Units                   |            | Simple      | Unsigned16 | 2     | S                  | RW                  | ppb       | 1423 = ppm<br>1424 = ppb<br>1558 = mg/l<br>1559 = ug/l<br>1521 = ug/kg<br>1522 = mg/kg | Common units setting for all streams.<br>SiO2 = ppb, ug/l only<br>PO4 & P = ppm, mg/l & mg/kg only |
|   | Decimal point           |            | Simple      | Integer8   | 1     | S                  | RW                  | 0         | 0 or 1   |  |
| Alarm hysteresis                          | 2                       | 35         | Simple      | Float      | 4     | S                  | RW                  | 0         |  |  |
| High-high alarm limit                     | 2                       | 37         | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  |  |  |
| High alarm limit                          | 2                       | 39         | Simple      | Float      | 4     | S                  | RW                  | 50000 ppb |  |  |
| Low alarm limit                           | 2                       | 41         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Low-low alarm limit                       | 2                       | 43         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Simulate                                  | 2                       | 50         | Record      | DS-50      | 6     | S                  | RW                  |           |  | Affects only the Profibus output and not the value displayed on the analyzer's display             |
|   | Simulate status         |            | Simple      | Unsigned8  | 1     | S                  | RW                  | 0 x 80    |  |  |
|   | Simulate value          |            | Simple      | Float      | 4     | S                  | RW                  | 0         |  |  |
|   | Simulate enable/disable |            | Simple      | Unsigned8  | 1     | S                  | RW                  | 0         | 0 = Disabled<br>Not 0 = Enabled  |  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 11 of 38)

| Description         | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range  | Note                                    |
|---------------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|--|---|
| Stream 2 tag        | 2    | 61         | Simple      | OctetString   | 20    | S                  | RW                  | Spaces  |  | Tag displayed on the analyzer's display |
| Stream 2 statistics | 2    | 62         | Record      |               | 12    |                    | R                   |         |  |   |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Maximum                                 |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Minimum                                 |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Average                                 |
| Alarm relay 2       | 2    | 63         | Record      |               | 24    |                    | RW                  |         |  |   |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = Off<br>1 to 6 = Stream number<br>7 = Cleaning  | Alarm source                            |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 1 = High process<br>2 = Low process<br>3 = High latch<br>4 = Low latch<br>5 = High annunciate<br>6 = Low annunciate<br>7 = Out of sample | Alarm type                              |
|                     |      |            | Simple      | VisibleString | 20    |                    |                     | Alarm A | ASCII string   |   |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Fail safe                               |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Log enable                              |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 12 of 38)

| Description          | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range                        | Note                                    |
|----------------------|------|------------|-------------|------------|-------|--------------------|---------------------|---------|------------------------------------|---|
| Current output 2     | 2    | 64         | Record      |            | 13    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = None<br>1 to 6 = Stream 1 to 6 | Output source                           |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 2000    | 0 to 5000                          | Output range high                       |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 0       | 0 to 5000                          | Output range low                        |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 4000    | 0 to 22000                         | Output type low * 1000                  |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 20000   | 0 to 22000                         | Output type high * 1000                 |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Calibration hold                        |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Out of sample indication                |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 22000   | 0 to 22000                         | Default output *1000 when out of sample |
| Alarm relay 2 limits | 2    | 65         | Record      |            | 12    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Trip                                    |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Hysteresis                              |
|                      |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 to 5000                          | Time hysteresis                         |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 13 of 38)

| Description                               | Slot                    | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default   | Valid Range  | Note   |
|---|-------------------------|------------|-------------|------------|-------|--------------------|---------------------|-----------|--|--|
| <b>Stream 3 Function Block Parameters</b> |                         |            |             |            |       |                    |                     |           |  |  |
| Stream 3 output                           | 3                       | 26         | Record      | DS-33      | 5     | D                  | Cyclic / R          |           |  |  |
| Output scale                              | 3                       | 28         | Record      | DS-36      | 11    | S                  | RW                  |           |  |  |
|   | High range              |            | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Low range               |            | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Units                   |            | Simple      | Unsigned16 | 2     | S                  | RW                  | ppb       | 1423 = ppm<br>1424 = ppb<br>1558 = mg/l<br>1559 = ug/l<br>1521 = ug/kg<br>1522 = mg/kg | Common units setting for all streams.<br>SiO2 = ppb, ug/l only<br>PO4 & P = ppm, mg/l & mg/kg only |
|   | Decimal point           |            | Simple      | Integer8   | 1     | S                  | RW                  | 0         | 0 or 1   |  |
| Alarm hysteresis                          | 3                       | 35         | Simple      | Float      | 4     | S                  | RW                  | 0         |  |  |
| High-high alarm limit                     | 3                       | 37         | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  |  |  |
| High alarm limit                          | 3                       | 39         | Simple      | Float      | 4     | S                  | RW                  | 50000 ppb |  |  |
| Low alarm limit                           | 3                       | 41         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Low-low alarm limit                       | 3                       | 43         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Simulate                                  | 3                       | 50         | Record      | DS-50      | 6     | S                  | RW                  |           |  | Affects only the Profibus output and not the value displayed on the analyzer's display             |
|   | Simulate status         |            |             | Unsigned8  | 1     | S                  | RW                  | 0 x 80    |  |  |
|   | Simulate value          |            |             | Float      | 4     | S                  | RW                  | 0         |  |  |
|   | Simulate enable/disable |            |             | Unsigned8  | 1     | S                  | RW                  | 0         | 0 = Disabled<br>Not 0 = Enabled  |  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 14 of 38)

| Description         | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range  | Note                                    |  |
|---------------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|--|---|--|
| Stream 3 tag        | 3    | 61         | Simple      | OctetString   | 20    | S                  | RW                  | Spaces  |  | Tag displayed on the analyzer's display |  |
| Stream 3 statistics | 3    | 62         | Record      |               | 12    |                    | R                   |         |  |   |  |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Maximum                                 |  |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Minimum                                 |  |
| Alarm relay 3       | 3    | 63         | Simple      | Float         | 4     |                    |                     |         |  | Average                                 |  |
|                     |      |            | Record      |               | 24    |                    | RW                  |         |  |   |  |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = Off<br>1 to 6 = stream number<br>7 = Cleaning  | Alarm source                            |  |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 1 = High process<br>2 = Low process<br>3 = High latch<br>4 = Low latch<br>5 = High annunciate<br>6 = Low annunciate<br>7 = Out of sample | Alarm type                              |  |
|                     |      |            | Simple      | VisibleString | 20    |                    |                     | Alarm A | ASCII string   |   |  |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Fail safe                               |  |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Log enable                              |  |
|                     |      |            |             |               |       |                    |                     |         |  |   |  |
|                     |      |            |             |               |       |                    |                     |         |  |   |  |
|                     |      |            |             |               |       |                    |                     |         |  |   |  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 15 of 38)

| Description          | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range                        | Note                                    |
|----------------------|------|------------|-------------|------------|-------|--------------------|---------------------|---------|------------------------------------|---|
| Current output 3     | 3    | 64         | Record      |            | 13    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = None<br>1 to 6 = Stream 1 to 6 | Output source                           |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 2000    | 0 to 5000                          | Output range high                       |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 0       | 0 to 5000                          | Output range low                        |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 4000    | 0 to 22000                         | Output type low * 1000                  |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 20000   | 0 to 22000                         | Output type high * 1000                 |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Calibration hold                        |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Out of sample indication                |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 22000   | 0 to 22000                         | Default output *1000 when out of sample |
| Alarm relay 3 limits | 3    | 65         | Record      |            | 12    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Trip                                    |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Hysteresis                              |
|                      |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 to 5000                          | Time hysteresis                         |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 16 of 38)

| Description                               | Slot                    | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default   | Valid Range  | Note   |
|---|-------------------------|------------|-------------|------------|-------|--------------------|---------------------|-----------|--|--|
| <b>Stream 4 Function Block Parameters</b> |                         |            |             |            |       |                    |                     |           |  |  |
| Stream 4 output                           | 4                       | 26         | Record      | DS-33      | 5     | D                  | Cyclic / R          |           |  |  |
| Output scale                              | 4                       | 28         | Record      | DS-36      | 11    | S                  | RW                  |           |  |  |
|   | High range              |            | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Low range               |            | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Units                   |            | Simple      | Unsigned16 | 2     | S                  | RW                  | ppb       | 1423 = ppm<br>1424 = ppb<br>1558 = mg/l<br>1559 = ug/l<br>1521 = ug/kg<br>1522 = mg/kg | Common units setting for all streams.<br>SiO2 = ppb, ug/l only<br>PO4 & P = ppm, mg/l & mg/kg only |
|   | Decimal point           |            | Simple      | Integer8   | 1     | S                  | RW                  | 0         | 0 or 1   |  |
| Alarm hysteresis                          | 4                       | 35         | Simple      | Float      | 4     | S                  | RW                  | 0         |  |  |
| High-high alarm limit                     | 4                       | 37         | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  |  |  |
| High alarm limit                          | 4                       | 39         | Simple      | Float      | 4     | S                  | RW                  | 50000 ppb |  |  |
| Low alarm limit                           | 4                       | 41         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Low-low alarm limit                       | 4                       | 43         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Simulate                                  | 4                       | 50         | Record      | DS-50      | 6     | S                  | RW                  |           |  | Affects only the Profibus output and not the value displayed on the analyzer's display             |
|   | Simulate status         |            |             | Unsigned8  | 1     | S                  | RW                  | 0 x 80    |  |  |
|   | Simulate value          |            |             | Float      | 4     | S                  | RW                  | 0         |  |  |
|   | Simulate enable/disable |            |             | Unsigned8  | 1     | S                  | RW                  | 0         | 0 = Disabled<br>Not 0 = Enabled  |  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 17 of 38)

| Description         | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range  | Note                                    |
|---------------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|--|---|
| Stream 4 tag        | 4    | 61         | Simple      | OctetString   | 20    | S                  | RW                  | Spaces  |  | Tag displayed on the analyzer's display |
| Stream 4 statistics | 4    | 62         | Record      |               | 12    |                    | R                   |         |  |   |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Maximum                                 |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Minimum                                 |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Average                                 |
| Alarm relay 4       | 4    | 63         | Record      |               | 24    |                    | RW                  |         |  |   |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = Off<br>1 to 6 = Stream number<br>7 = Cleaning  | Alarm source                            |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 1 = High process<br>2 = Low process<br>3 = High latch<br>4 = Low latch<br>5 = High annunciate<br>6 = Low annunciate<br>7 = Out of sample | Alarm type                              |
|                     |      |            | Simple      | VisibleString | 20    |                    |                     | Alarm A | ASCII string   |   |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Fail safe                               |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Log enable                              |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 18 of 38)

| Description          | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range                        | Note                                    |
|----------------------|------|------------|-------------|------------|-------|--------------------|---------------------|---------|------------------------------------|---|
| Current output 4     | 4    | 64         | Record      |            | 13    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = None<br>1 to 6 = Stream 1 to 6 | Output source                           |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 2000    | 0 to 5000                          | Output range high                       |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 0       | 0 to 5000                          | Output range low                        |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 4000    | 0 to 22000                         | Output type low * 1000                  |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 20000   | 0 to 22000                         | Output type high * 1000                 |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Calibration hold                        |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Out of sample indication                |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 22000   | 0 to 22000                         | Default output *1000 when out of sample |
| Alarm relay 4 limits | 4    | 65         | Record      |            | 12    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Trip                                    |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Hysteresis                              |
|                      |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 to 5000                          | Time hysteresis                         |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 19 of 38)

| Description                               | Slot                    | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default   | Valid Range  | Note   |
|---|-------------------------|------------|-------------|------------|-------|--------------------|---------------------|-----------|--|--|
| <b>Stream 5 Function Block Parameters</b> |                         |            |             |            |       |                    |                     |           |  |  |
| Stream 5 output                           | 5                       | 26         | Record      | DS-33      | 5     | D                  | Cyclic / R          |           |  |  |
| Output scale                              | 5                       | 28         | Record      | DS-36      | 11    | S                  | RW                  |           |  |  |
|   | High range              |            | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Low range               |            | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Units                   |            | Simple      | Unsigned16 | 2     | S                  | RW                  | ppb       | 1423 = ppm<br>1424 = ppb<br>1558 = mg/l<br>1559 = ug/l<br>1521 = ug/kg<br>1522 = mg/kg | Common units setting for all streams.<br>SiO2 = ppb, ug/l only<br>PO4 & P = ppm, mg/l & mg/kg only |
|   | Decimal point           |            | Simple      | Integer8   | 1     | S                  | RW                  | 0         | 0 or 1   |  |
| Alarm hysteresis                          | 5                       | 35         | Simple      | Float      | 4     | S                  | RW                  | 0         |  |  |
| High-high alarm limit                     | 5                       | 37         | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  |  |  |
| High alarm limit                          | 5                       | 39         | Simple      | Float      | 4     | S                  | RW                  | 50000 ppb |  |  |
| Low alarm limit                           | 5                       | 41         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Low-low alarm limit                       | 5                       | 43         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Simulate                                  | 5                       | 50         | Record      | DS-50      | 6     | S                  | RW                  |           |  | Affects only the Profibus output and not the value displayed on the analyzer's display             |
|   | Simulate status         |            |             | Unsigned8  | 1     | S                  | RW                  | 0 x 80    |  |  |
|   | Simulate value          |            |             | Float      | 4     | S                  | RW                  | 0         |  |  |
|   | Simulate enable/disable |            |             | Unsigned8  | 1     | S                  | RW                  | 0         | 0 = Disabled<br>Not 0 = Enabled  |  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 20 of 38)

| Description         | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range  | Note                                    |
|---------------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|--|---|
| Stream 5 tag        | 5    | 61         | Simple      | OctetString   | 20    | S                  | RW                  | Spaces  |  | Tag displayed on the analyzer's display |
| Stream 5 statistics | 5    | 62         | Record      |               | 12    |                    | R                   |         |  |   |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Maximum                                 |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Minimum                                 |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Average                                 |
| Alarm relay 5       | 5    | 63         | Record      |               | 24    |                    | RW                  |         |  |   |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = Off<br>1 to 6 = Stream number<br>7 = Clearing  | Alarm source                            |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 1 = High process<br>2 = Low process<br>3 = High latch<br>4 = Low latch<br>5 = High annunciate<br>6 = Low annunciate<br>7 = Out of sample | Alarm type                              |
|                     |      |            | Simple      | VisibleString | 20    |                    |                     | Alarm A | ASCII string   |   |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Fail safe                               |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Log enable                              |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 21 of 38)

| Description          | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range                        | Note                                    |
|----------------------|------|------------|-------------|------------|-------|--------------------|---------------------|---------|------------------------------------|---|
| Current output 5     | 5    | 64         | Record      |            | 13    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = None<br>1 to 6 = Stream 1 to 6 | Output source                           |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 2000    | 0 to 5000                          | Output range high                       |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 0       | 0 to 5000                          | Output range low                        |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 4000    | 0 to 22000                         | Output type low * 1000                  |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 20000   | 0 to 22000                         | Output type high * 1000                 |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Calibration hold                        |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Out of sample indication                |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 22000   | 0 to 22000                         | Default output *1000 when out of sample |
| Alarm relay 5 limits | 5    | 65         | Record      |            | 12    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Trip                                    |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Hysteresis                              |
|                      |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 to 5000                          | Time hysteresis                         |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 22 of 38)

| Description                               | Slot                    | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default   | Valid Range  | Note   |
|---|-------------------------|------------|-------------|------------|-------|--------------------|---------------------|-----------|--|--|
| <b>Stream 6 Function Block Parameters</b> |                         |            |             |            |       |                    |                     |           |  |  |
| Stream 6 output                           | 6                       | 26         | Record      | DS-33      | 5     | D                  | Cyclic / R          |           |  |  |
| Output scale                              | 6                       | 28         | Record      | DS-36      | 11    | S                  | RW                  |           |  |  |
|   | High range              |            | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Low range               |            | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     | SiO2 = 0 to 5000ppb<br>PO4 = 0 to 12ppm<br>P = 0 to 4ppm                               |  |
|   | Units                   |            | Simple      | Unsigned16 | 2     | S                  | RW                  | ppb       | 1423 = ppm<br>1424 = ppb<br>1558 = mg/l<br>1559 = ug/l<br>1521 = ug/kg<br>1522 = mg/kg | Common units setting for all streams.<br>SiO2 = ppb, ug/l only<br>PO4 & P = ppm, mg/l & mg/kg only |
|   | Decimal point           |            | Simple      | Integer8   | 1     | S                  | RW                  | 0         | 0 or 1   |  |
| Alarm hysteresis                          | 6                       | 35         | Simple      | Float      | 4     | S                  | RW                  | 0         |  |  |
| High-high alarm limit                     | 6                       | 37         | Simple      | Float      | 4     | S                  | RW                  | 5000 ppb  |  |  |
| High alarm limit                          | 6                       | 39         | Simple      | Float      | 4     | S                  | RW                  | 50000 ppb |  |  |
| Low alarm limit                           | 6                       | 41         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Low-low alarm limit                       | 6                       | 43         | Simple      | Float      | 4     | S                  | RW                  | 0 ppb     |  |  |
| Simulate                                  | 6                       | 50         | Record      | DS-50      | 6     | S                  | RW                  |           |  | Affects only the Profibus output and not the value displayed on the analyzer's display             |
|   | Simulate status         |            | Simple      | Unsigned8  | 1     | S                  | RW                  | 0 x 80    |  |  |
|   | Simulate value          |            | Simple      | Float      | 4     | S                  | RW                  | 0         |  |  |
|   | Simulate enable/disable |            | Simple      | Unsigned8  | 1     | S                  | RW                  | 0         | 0 = Disabled<br>Not 0 = Enabled  |  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 23 of 38)

| Description         | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range  | Note                                    |
|---------------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|--|---|
| Stream 6 tag        | 6    | 61         | Simple      | OctetString   | 20    | S                  | RW                  | Spaces  |  | Tag displayed on the analyzer's display |
| Stream 6 statistics | 6    | 62         | Record      |               | 12    |                    | R                   |         |  |   |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Maximum                                 |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Minimum                                 |
|                     |      |            | Simple      | Float         | 4     |                    |                     |         |  | Average                                 |
| Alarm relay 6       | 6    | 63         | Record      |               | 24    |                    | RW                  |         |  |   |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = Off<br>1 to 6 = Stream number<br>7 = Cleaning  | Alarm source                            |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 1 = High process<br>2 = Low process<br>3 = High latch<br>4 = Low latch<br>5 = High annunciate<br>6 = Low annunciate<br>7 = Out of sample | Alarm type                              |
|                     |      |            | Simple      | VisibleString | 20    |                    |                     | Alarm A | ASCII string   |   |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Fail safe                               |
|                     |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True  | Log enable                              |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 24 of 38)

| Description          | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range                        | Note                                    |
|----------------------|------|------------|-------------|------------|-------|--------------------|---------------------|---------|------------------------------------|---|
| Current output 6     | 6    | 64         | Record      |            | 13    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = None<br>1 to 6 = Stream 1 to 6 | Output source                           |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 2000    | 0 to 5000                          | Output range high                       |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 0       | 0 to 5000                          | Output range low                        |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 4000    | 0 to 22000                         | Output type low * 1000                  |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 20000   | 0 to 22000                         | Output type high * 1000                 |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Calibration hold                        |
|                      |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True              | Out of sample indication                |
|                      |      |            | Simple      | Unsigned16 | 2     |                    |                     | 22000   | 0 to 22000                         | Default output *1000 when out of sample |
| Alarm relay 6 limits | 6    | 65         | Record      |            | 12    |                    | RW                  |         |                                    |   |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Trip                                    |
|                      |      |            | Simple      | Float      | 4     |                    |                     | 0       | 0 to 5000                          | Hysteresis                              |
|                      |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 to 5000                          | Time hysteresis                         |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 25 of 38)

| Description         | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range   | Note   |
|---------------------|------|------------|-------------|------------|-------|--------------------|---------------------|---------|---|--|
| Security definition | 7    | 145        | Record      |            | 10    |                    | RW                  |         |   |  |
|                     |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Basic<br>1 = Advanced   | Security type                                |
|                     |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Password<br>1 = Switch protected  |  |
|                     |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Disabled<br>1 = Enabled   | Logging level security                       |
|                     |      |            | Simple      | Unsigned16 | 2     |                    |                     | 0       | 0 to 9999   | Basic security logging level password        |
|                     |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = False<br>1 = True   | Re-enter password at first use               |
|                     |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Off<br>1 = 7 days<br>2 = 14 days<br>3 = 30 days<br>4 = 60 days<br>5 = 90 days<br>6 = 180 days<br>7 = 360 days | Password expiry time                         |
|                     |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Off<br>1 = 7 days<br>2 = 14 days<br>3 = 30 days<br>4 = 60 days<br>5 = 90 days<br>6 = 180 days<br>7 = 360 days | Inactive user password expiry time           |
|                     |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 to 10<br>0 = infinite   | Number of incorrect password entries allowed |
|                     |      |            | Simple      | Unsigned8  | 1     |                    |                     | 4       | 4 to 20   | Minimum password length                      |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 26 of 38)

| Description   | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range   | Note                                     |
|---------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|---|--|
| User 1 access | 7    | 146        | Record      |               | 23    |                    | RW                  |         |   |  |
|               |      |            | Simple      | VisibleString | 20    |                    |                     | User 1  | ASCII string  | User name                                |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 3       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True                                     | User access to logging                   |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |
| User 2 access | 7    | 147        | Record      |               | 23    |                    | RW                  |         |   |  |
|               |      |            | Simple      | VisibleString | 20    |                    |                     | User 2  | ASCII string  | User name                                |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True                                     | User access to logging                   |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |
| User 3 access | 7    | 148        | Record      |               | 23    |                    | RW                  |         |   |  |
|               |      |            | Simple      | VisibleString | 20    |                    |                     | User 3  | ASCII string  | User name                                |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True                                     | User access to logging                   |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 27 of 38)

| Description   | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range   | Note                                     |
|---------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|---|--|
| User 4 access | 7    | 149        | Record      |               | 23    |                    | RW                  |         |   |  |
|               |      |            | Simple      | VisibleString | 20    |                    |                     | User 4  | ASCII string  | User name                                |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True                                     | User access to logging                   |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 1       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |
| User 5 access | 7    | 150        | Record      |               | 23    |                    | RW                  |         |   | Advanced configuration only              |
|               |      |            | Simple      | VisibleString | 20    |                    |                     | User 5  | ASCII string  | User name                                |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to logging                   |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |
| User 6 access | 7    | 151        | Record      |               | 23    |                    | RW                  |         |   | Advanced configuration only              |
|               |      |            | Simple      | VisibleString | 20    |                    |                     | User 6  | ASCII string  | User name                                |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to logging                   |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 28 of 38)

| Description   | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range   | Note                                     |
|---------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|---|--|
| User 7 access | 7    | 152        | Record      |               | 23    |                    | RW                  |         |   | Advanced configuration only              |
|               |      |            | Simple      | VisibleString | 20    |                    |                     | User 7  | ASCII string  | User name                                |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to logging                   |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |
| User 8 access | 7    | 153        | Record      |               | 23    |                    | RW                  |         |   | Advanced configuration only              |
|               |      |            | Simple      | VisibleString | 20    |                    |                     | User 8  | ASCII string  | User name                                |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to logging                   |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |
| User 9 access | 7    | 154        | Record      |               | 23    |                    | RW                  |         |   | Advanced configuration only              |
|               |      |            | Simple      | VisibleString | 20    |                    |                     | User 9  | ASCII string  | User name                                |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to logging                   |
|               |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 29 of 38)

| Description    | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range   | Note                                     |
|----------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|---|--|
| User 10 access | 7    | 155        | Record      |               | 23    |                    | RW                  |         |   | Advanced configuration only              |
|                |      |            | Simple      | VisibleString | 20    |                    |                     | User 10 | ASCII string  | User name                                |
|                |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|                |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to logging                   |
|                |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |
| User 11 access | 7    | 156        | Record      |               | 23    |                    | RW                  |         |   | Advanced configuration only              |
|                |      |            | Simple      | VisibleString | 20    |                    |                     | User 11 | ASCII string  | User name                                |
|                |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|                |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to logging                   |
|                |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |
| User 12 access | 7    | 157        | Record      |               | 23    |                    | RW                  |         |   | Advanced configuration only              |
|                |      |            | Simple      | VisibleString | 20    |                    |                     | User 12 | ASCII string  | User name                                |
|                |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = No access<br>1 = Load only<br>2 = Limited<br>3 = Full | User access to configuration             |
|                |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to logging                   |
|                |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0       | 0 = False<br>1 = True                                     | User access to maintenance & calibration |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 30 of 38)

| Description         | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range  | Note                        |
|---------------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|--------------|-----------------------------|
| Email 2 recipient 1 | 7    | 158        | Simple      | VisibleString | 32    |                    | R                   |         | ASCII string | First 32 bytes              |
| Email 2 recipient 1 | 7    | 159        | Simple      | VisibleString | 8     |                    | R                   |         | ASCII string | Last 8 bytes                |
| Email 2 recipient 2 | 7    | 160        | Simple      | VisibleString | 32    |                    | R                   |         | ASCII string | First 32 bytes              |
| Email 2 recipient 2 | 7    | 161        | Simple      | VisibleString | 8     |                    | R                   |         | ASCII string | Last 8 bytes                |
| Email 2 recipient 3 | 7    | 162        | Simple      | VisibleString | 32    |                    | R                   |         | ASCII string | First 32 bytes              |
| Email 2 recipient 3 | 7    | 163        | Simple      | VisibleString | 8     |                    | R                   |         | ASCII string | Last 8 bytes                |
| User 1 passwords    | 7    | 169        | Record      |               | 22    |                    | RW                  |         |              |                             |
|                     |      |            | Simple      | Unsigned16    | 2     |                    |                     | 0       | 0 to 9999    | Basic security password     |
|                     |      |            | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string | Advanced security password  |
| User 2 passwords    | 7    | 170        | Record      |               | 22    |                    | RW                  |         |              |                             |
|                     |      |            | Simple      | Unsigned16    | 2     |                    |                     | 0       | 0 to 9999    | Basic security password     |
|                     |      |            | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string | Advanced security password  |
| User 3 passwords    | 7    | 171        | Record      |               | 22    |                    | RW                  |         |              |                             |
|                     |      |            | Simple      | Unsigned16    | 2     |                    |                     | 0       | 0 to 9999    | Basic security password     |
|                     |      |            | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string | Advanced security password  |
| User 4 passwords    | 7    | 172        | Record      |               | 22    |                    | RW                  |         |              |                             |
|                     |      |            | Simple      | Unsigned16    | 2     |                    |                     | 0       | 0 to 9999    | Basic security password     |
|                     |      |            | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string | Advanced security password  |
| User 5 passwords    | 7    | 173        | Record      |               | 22    |                    | RW                  |         |              |                             |
|                     |      |            | Simple      | Unsigned16    | 2     |                    |                     | 0       | 0            | Advanced configuration only |
|                     |      |            | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string | Advanced security password  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 31 of 38)

| Description       | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range  | Note                        |
|-------------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|--------------|-----------------------------|
| User 6 passwords  | 7    | 174        | Record      |               | 22    |                    | RW                  |         |              | Advanced configuration only |
|                   |      |            | Simple      | Unsigned16    | 2     |                    | 0                   | 0       |              | 0                           |
| User 7 passwords  | 7    | 175        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string | Advanced security password  |
|                   |      |            | Record      |               | 22    |                    | RW                  |         |              |                             |
| User 8 passwords  | 7    | 176        | Simple      | Unsigned16    | 2     |                    |                     | 0       | 0            |                             |
|                   |      |            | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string | Advanced security password  |
| User 9 passwords  | 7    | 177        | Record      |               | 22    |                    | RW                  |         |              | Advanced configuration only |
|                   |      |            | Simple      | Unsigned16    | 2     |                    |                     | 0       | 0            |                             |
| User 10 passwords | 7    | 178        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string | Advanced security password  |
|                   |      |            | Record      |               | 22    |                    | RW                  |         |              |                             |
| User 11 passwords | 7    | 179        | Simple      | Unsigned16    | 2     |                    |                     | 0       | 0            |                             |
|                   |      |            | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string | Advanced security password  |
| User 12 passwords | 7    | 180        | Record      |               | 22    |                    | RW                  |         |              | Advanced configuration only |
|                   |      |            | Simple      | Unsigned16    | 2     |                    |                     | 0       | 0            |                             |
|                   |      |            | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string | Advanced security password  |
|                   |      |            | Record      |               | 22    |                    | RW                  |         |              |                             |
|                   |      |            | Simple      | Unsigned16    | 2     |                    |                     | 0       | 0            |                             |
|                   |      |            | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string | Advanced security password  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 32 of 38)

| Description | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range  | Note |
|-------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------|--------------|------|
| Message 1   | 7    | 181        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 2   | 7    | 182        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 3   | 7    | 183        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 4   | 7    | 184        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 5   | 7    | 185        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 6   | 7    | 186        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 7   | 7    | 187        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 8   | 7    | 188        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 9   | 7    | 189        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 10  | 7    | 190        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 11  | 7    | 191        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 12  | 7    | 192        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 13  | 7    | 193        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 14  | 7    | 194        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 15  | 7    | 195        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 16  | 7    | 196        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 17  | 7    | 197        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 18  | 7    | 198        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 19  | 7    | 199        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 20  | 7    | 200        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 21  | 7    | 201        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 22  | 7    | 202        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 23  | 7    | 203        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |
| Message 24  | 7    | 204        | Simple      | VisibleString | 20    |                    | RW                  |         | ASCII string |      |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 33 of 38)

| Description     | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default       | Valid Range  | Note                         |
|-----------------|------|------------|-------------|---------------|-------|--------------------|---------------------|---------------|--|------------------------------|
| I/P Address     | 7    | 205        | Simple      | VisibleString | 16    |                    | R                   | 192.168.1.6   | ASCII string   | Dotted IP address            |
| Subnet mask     | 7    | 206        | Simple      | VisibleString | 16    |                    | R                   | 255.255.255.0 | ASCII string   |                              |
| Default gateway | 7    | 207        | Simple      | VisibleString | 16    |                    | R                   |               | ASCII string   |                              |
| FTP user 1      | 7    | 208        | Record      |               | 29    |                    | R                   |               |  |                              |
|                 |      |            | Simple      | VisibleString | 25    |                    |                     |               | ASCII string   | Username and password string |
|                 |      |            | Simple      | Unsigned32    | 4     |                    |                     |               | Bit1 = Write<br>Bit2 = Read access<br>Bit3 = Operator<br>Bit4 = Configuration access | Access rights                |
| FTP user 2      | 7    | 209        | Record      |               | 29    |                    | R                   |               |  |                              |
|                 |      |            | Simple      | VisibleString | 25    |                    |                     |               | ASCII string   | Username and password string |
|                 |      |            | Simple      | Unsigned32    | 4     |                    |                     |               | Bit1 = Write<br>Bit2 = Read access<br>Bit3 = Operator<br>Bit4 = Configuration access | Access rights                |
| FTP user 3      | 7    | 210        | Record      |               | 29    |                    | R                   |               |  |                              |
|                 |      |            | Simple      | VisibleString | 25    |                    |                     |               | ASCII string   | Username and password string |
|                 |      |            | Simple      | Unsigned32    | 4     |                    |                     |               | Bit1 = Write<br>Bit2 = Read access<br>Bit3 = Operator<br>Bit4 = Configuration access | Access rights                |
| FTP user 4      | 7    | 211        | Record      |               | 29    |                    | R                   |               |  |                              |
|                 |      |            | Simple      | VisibleString | 25    |                    |                     |               | ASCII string   | Username and password string |
|                 |      |            | Simple      | Unsigned32    | 4     |                    |                     |               | Bit1 = Write<br>Bit2 = Read access<br>Bit3 = Operator<br>Bit4 = Configuration access | Access rights                |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 34 of 38)

| Description            | Slot | Slot Index | Object Type | Data Type     | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default  | Valid Range                      | Note                                   |
|------------------------|------|------------|-------------|---------------|-------|--------------------|---------------------|----------|----------------------------------|--|
| Email 1 server address | 7    | 212        | Simple      | Unsigned32    | 4     |                    | R                   | 16847020 | Network address                  | Network byte order (172.16.1.1)        |
| Email 2 server address | 7    | 213        | Simple      | Unsigned32    | 4     |                    | R                   | 16847020 | Network address                  | Network byte order                     |
| Email 1 recipient 1    | 7    | 214        | Simple      | VisibleString | 32    |                    | R                   |          | ASCII string                     | First 32 bytes                         |
| Email 1 recipient 1    | 7    | 215        | Simple      | VisibleString | 8     |                    | R                   |          | ASCII string                     | Last 8 bytes                           |
| Email 1 recipient 2    | 7    | 216        | Simple      | VisibleString | 32    |                    | R                   |          | ASCII string                     | First 32 bytes                         |
| Email 1 recipient 2    | 7    | 217        | Simple      | VisibleString | 8     |                    | R                   |          | ASCII string                     | Last 8 bytes                           |
| Email 1 recipient 3    | 7    | 218        | Simple      | VisibleString | 32    |                    | R                   |          | ASCII string                     | First 32 bytes                         |
| Email 1 recipient 3    | 7    | 219        | Simple      | VisibleString | 8     |                    | R                   |          | ASCII string                     | Last 8 bytes                           |
| Email 1 trigger 1      | 7    | 222        | Record      |               | 5     |                    | R                   |          |                                  |  |
|                        |      |            | Simple      | Unsigned32    | 4     |                    |                     | 0        | 0 = No source                    | Source name, type and number reference |
|                        |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0        | 0 = Non-inverted<br>1 = Inverted |  |
| Email 2 trigger 1      | 7    | 223        | Record      |               | 5     |                    | R                   |          |                                  |  |
|                        |      |            | Simple      | Unsigned32    | 4     |                    |                     | 0        | 0 = No source                    | Source name, type and number reference |
|                        |      |            | Simple      | Unsigned8     | 1     |                    |                     | 0        | 0 = Non-inverted<br>1 = Inverted |  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 35 of 38)

| Description       | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default                          | Valid Range                            | Note |
|-------------------|------|------------|-------------|------------|-------|--------------------|---------------------|----------------------------------|--|------|
| Email 1 trigger 2 | 7    | 224        | Record      |            | 5     |                    |                     |                                  |  |      |
|                   |      |            | Simple      | Unsigned32 | 4     |                    | 0                   | 0 = No source                    | Source name, type and number reference |      |
| Email 2 trigger 2 | 7    | 225        | Record      |            | 5     |                    | R                   |                                  |  |      |
|                   |      |            | Simple      | Unsigned8  | 1     |                    | 0                   | 0 = Non-inverted<br>1 = Inverted |  |      |
| Email 1 trigger 3 | 7    | 226        | Record      |            | 5     |                    |                     |                                  |  |      |
|                   |      |            | Simple      | Unsigned32 | 4     |                    | 0                   | 0 = No source                    | Source name, type and number reference |      |
| Email 2 trigger 3 | 7    | 227        | Record      |            | 5     |                    | R                   |                                  |  |      |
|                   |      |            | Simple      | Unsigned8  | 1     |                    | 0                   | 0 = Non-inverted<br>1 = Inverted |  |      |
| Email 1 trigger 4 | 7    | 228        | Record      |            | 5     |                    |                     |                                  |  |      |
|                   |      |            | Simple      | Unsigned32 | 4     |                    | 0                   | 0 = No source                    | Source name, type and number reference |      |
| Email 2 trigger 4 | 7    | 229        | Record      |            | 5     |                    | R                   |                                  |  |      |
|                   |      |            | Simple      | Unsigned8  | 1     |                    | 0                   | 0 = Non-inverted<br>1 = Inverted |  |      |
|                   |      |            | Record      |            | 5     |                    |                     |                                  |  |      |
|                   |      |            | Simple      | Unsigned32 | 4     |                    | 0                   | 0 = No source                    | Source name, type and number reference |      |
|                   |      |            | Record      |            | 5     |                    | R                   |                                  |  |      |
|                   |      |            | Simple      | Unsigned8  | 1     |                    | 0                   | 0 = Non-inverted<br>1 = Inverted |  |      |
|                   |      |            | Record      |            | 5     |                    |                     |                                  |  |      |
|                   |      |            | Simple      | Unsigned32 | 4     |                    | 0                   | 0 = No source                    | Source name, type and number reference |      |
|                   |      |            | Record      |            | 5     |                    |                     |                                  |  |      |
|                   |      |            | Simple      | Unsigned8  | 1     |                    | 0                   | 0 = Non-inverted<br>1 = Inverted |  |      |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 36 of 38)

| Description       | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default | Valid Range                      | Note                                   |
|-------------------|------|------------|-------------|------------|-------|--------------------|---------------------|---------|----------------------------------|--|
| Email 1 trigger 5 | 7    | 230        | Record      |            | 5     |                    | R                   |         |                                  |  |
|                   |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 = No source                    | Source name, type and number reference |
|                   |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Non-inverted<br>1 = Inverted |  |
| Email 2 trigger 5 | 7    | 231        | Record      |            | 5     |                    | R                   |         |                                  |  |
|                   |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 = No source                    | Source name, type and number reference |
|                   |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Non-inverted<br>1 = Inverted |  |
| Email 1 trigger 6 | 7    | 232        | Record      |            | 5     |                    | R                   |         |                                  |  |
|                   |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 = No source                    | Source name, type and number reference |
|                   |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Non-inverted<br>1 = Inverted |  |
| Email 2 trigger 6 | 7    | 233        | Record      |            | 5     |                    | R                   |         |                                  |  |
|                   |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 = No source                    | Source name, type and number reference |
|                   |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Non-inverted<br>1 = Inverted |  |
| Email 1 trigger 7 | 7    | 234        | Record      |            | 5     |                    | R                   |         |                                  |  |
|                   |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 = No source                    | Source name, type and number reference |
|                   |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Non-inverted<br>1 = Inverted |  |
| Email 2 trigger 7 | 7    | 235        | Record      |            | 5     |                    | R                   |         |                                  |  |
|                   |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 = No source                    | Source name, type and number reference |
|                   |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Non-inverted<br>1 = Inverted |  |
|                   |      |            | Simple      | Unsigned32 | 4     |                    |                     | 0       | 0 = No source                    | Source name, type and number reference |
|                   |      |            | Simple      | Unsigned8  | 1     |                    |                     | 0       | 0 = Non-inverted<br>1 = Inverted |  |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 37 of 38)

| Description        | Slot | Slot Index | Object Type | Data Type  | Bytes | Store <sup>1</sup> | Access <sup>2</sup> | Default                          | Valid Range                            | Note |
|--------------------|------|------------|-------------|------------|-------|--------------------|---------------------|----------------------------------|--|------|
| Email 1 trigger 8  | 7    | 236        | Record      |            | 5     |                    | R                   |                                  |  |      |
|                    |      |            | Simple      | Unsigned32 | 4     |                    | 0                   | 0 = No source                    | Source name, type and number reference |      |
| Email 2 trigger 8  | 7    | 237        | Record      |            | 5     |                    | R                   |                                  |  |      |
|                    |      |            | Simple      | Unsigned8  | 1     |                    | 0                   | 0 = Non-inverted<br>1 = Inverted |  |      |
| Email 1 trigger 9  | 7    | 238        | Record      |            | 5     |                    | R                   |                                  |  |      |
|                    |      |            | Simple      | Unsigned32 | 4     |                    | 0                   | 0 = No source                    | Source name, type and number reference |      |
| Email 2 trigger 9  | 7    | 239        | Record      |            | 5     |                    | R                   |                                  |  |      |
|                    |      |            | Simple      | Unsigned8  | 1     |                    | 0                   | 0 = Non-inverted<br>1 = Inverted |  |      |
| Email 1 trigger 10 | 7    | 240        | Record      |            | 5     |                    | R                   |                                  |  |      |
|                    |      |            | Simple      | Unsigned32 | 4     |                    | 0                   | 0 = No source                    | Source name, type and number reference |      |
| Email 2 trigger 10 | 7    | 241        | Record      |            | 5     |                    | R                   |                                  |  |      |
|                    |      |            | Simple      | Unsigned8  | 1     |                    | 0                   | 0 = Non-inverted<br>1 = Inverted |  |      |
|                    |      |            | Record      |            | 5     |                    | R                   |                                  |  |      |
|                    |      |            | Simple      | Unsigned32 | 4     |                    | 0                   | 0 = No source                    | Source name, type and number reference |      |
|                    |      |            | Record      |            | 5     |                    | R                   |                                  |  |      |
|                    |      |            | Simple      | Unsigned8  | 1     |                    | 0                   | 0 = Non-inverted<br>1 = Inverted |  |      |
|                    |      |            | Record      |            | 5     |                    | R                   |                                  |  |      |
|                    |      |            | Simple      | Unsigned32 | 4     |                    | 0                   | 0 = No source                    | Source name, type and number reference |      |
|                    |      |            | Record      |            | 5     |                    | R                   |                                  |  |      |
|                    |      |            | Simple      | Unsigned8  | 1     |                    | 0                   | 0 = Non-inverted<br>1 = Inverted |  |      |

<sup>1</sup> Store definitions – refer to page 7

<sup>2</sup> Access definitions – refer to page 7

Table B.1 Data Structure (Sheet 38 of 38)

| Octet            | Bit | Description                                  | Diagnosis Mask (1 = enabled) |
|------------------|-----|--|------------------------------|
| <b>DIAGNOSIS</b> |     |  |                              |
| 1                | 0   | Hardware failure – electronic                | 1                            |
|                  | 1   | Hardware failure – mechanical                | 0                            |
|                  | 2   | Motor temperature too high                   | 0                            |
|                  | 3   | Electronic temperature too high              | 1                            |
|                  | 4   | Memory error                                 | 1                            |
|                  | 5   | Failure in measurement                       | 1                            |
|                  | 6   | Device not initialized (no self-calibration) | 0                            |
|                  | 7   | Self-calibration failed                      | 0                            |
| 2                | 0   | Zero point error (limit position)            | 0                            |
|                  | 1   | Power supply failed                          | 1                            |
|                  | 2   | Configuration not valid                      | 1                            |
|                  | 3   | New start-up (warm startup) carried out      | 0                            |
|                  | 4   | Re-start (cold startup) carried out          | 0                            |
|                  | 5   | Maintenance required                         | 1                            |
|                  | 6   | Characterization invalid                     | 0                            |
|                  | 7   | Identification number violation              | 0                            |
| 3                |     |  |                              |
| 4                |     |  |                              |

Table B.2 Diagnostic Data (Sheet 1 of 3)

| Octet                      | Bit | Description                                     | Diagnosis Mask (1 = enabled) |
|----------------------------|-----|---|------------------------------|
| <b>DIAGNOSIS_EXTENSION</b> |     |   |                              |
| 1                          | 0   | Out of reagent 1                                | 1                            |
|                            | 1   | Out of reagent 2                                | 1                            |
|                            | 2   | Out of reagent 3                                | 1                            |
|                            | 3   | Out of reagent 4                                | 1                            |
|                            | 4   | Out of all samples                              | 1                            |
|                            | 5   | Out of sample 1                                 | 1                            |
|                            | 6   | Out of sample 2                                 | 1                            |
|                            | 7   | Out of sample 3                                 | 1                            |
| 2                          | 0   | Out of sample 4                                 | 1                            |
|                            | 1   | Out of sample 5                                 | 1                            |
|                            | 2   | Out of sample 6                                 | 1                            |
|                            | 3   | Out of cleaning solution                        | 1                            |
|                            | 4   | Out of zero calibration solution                | 1                            |
|                            | 5   | Out of secondary calibration solution           | 1                            |
|                            | 6   | Reserved for future use                         | 0                            |
|                            | 7   | Reserved for future use                         | 0                            |
| 3                          | 0   | Reserved for future use                         | 0                            |
|                            | 1   | Reserved for future use                         | 0                            |
|                            | 2   | Reserved for future use                         | 0                            |
|                            | 3   | Reserved for future use                         | 0                            |
|                            | 4   | Reserved for future use                         | 0                            |
|                            | 5   | Reserved for future use                         | 0                            |
|                            | 6   | Reserved for future use                         | 0                            |
|                            | 7   | Reserved for future use                         | 0                            |
| 4                          | 0   | Control temperature too high >10°C              | 1                            |
|                            | 1   | Control temperature too high/low >2°C and <10°C | 1                            |
|                            | 2   | A/D error main measurement                      | 1                            |
|                            | 3   | Reserved for future use                         | 0                            |
|                            | 4   | Faulty measurement optics                       | 1                            |
|                            | 5   | Failed reaction block temperature sensor        | 1                            |
|                            | 6   | Excessive secondary current                     | 1                            |
|                            | 7   | Cleaning in progress                            | 1                            |

Table B.2 Diagnostic Data (Sheet 2 of 3)

| Octet | Bit | Description  | Diagnosis Mask (1 = enabled) |
|-------|-----|--|------------------------------|
| 5     | 0   | Calibration in progress                              | 1                            |
|       | 1   | In manual test settings                              | 1                            |
|       | 2   | Annual service in progress                           | 1                            |
|       | 3   | Solution replacement in progress                     | 1                            |
|       | 4   | Excessive zero offset                                | 1                            |
|       | 5   | Calibration factor too high/low                      | 1                            |
|       | 6   | Next annual service due in x days                    | 1                            |
|       | 7   | Next annual service overdue                          | 1                            |
| 6     | 0   | Less than x days reagent left                        | 1                            |
|       | 1   | Less than x days zero calibration solution left      | 1                            |
|       | 2   | Less than x days secondary calibration solution left | 1                            |
|       | 3   | Less than x days cleaning solution left              | 1                            |
|       | 4   | Media card full                                      | 1                            |
|       | 5   | Internal communications failure                      | 1                            |
|       | 6   |  |                              |
|       | 7   |  |                              |

Table B.2 Diagnostic Data (Sheet 3 of 3)

## Notes

# PRODUCTS & CUSTOMER SUPPORT

## Products

### Automation Systems

- for the following industries:
  - Chemical & Pharmaceutical
  - Food & Beverage
  - Manufacturing
  - Metals and Minerals
  - Oil, Gas & Petrochemical
  - Pulp and Paper

### Drives and Motors

- AC and DC Drives, AC and DC Machines, AC Motors to 1kV
- Drive Systems
- Force Measurement
- Servo Drives

### Controllers & Recorders

- Single and Multi-loop Controllers
- Circular Chart and Strip Chart Recorders
- Paperless Recorders
- Process Indicators

### Flexible Automation

- Industrial Robots and Robot Systems

### Flow Measurement

- Electromagnetic Flowmeters
- Mass Flowmeters
- Turbine Flowmeters
- Wedge Flow Elements

### Marine Systems & Turbochargers

- Electrical Systems
- Marine Equipment
- Offshore Retrofit and Refurbishment

### Process Analytics

- Process Gas Analysis
- Systems Integration

### Transmitters

- Pressure
- Temperature
- Level
- Interface Modules

### Valves, Actuators and Positioners

- Control Valves
- Actuators
- Positioners

### Water, Gas & Industrial Analytics Instrumentation

- pH, Conductivity and Dissolved Oxygen Transmitters and Sensors
- Ammonia, Nitrate, Phosphate, Silica, Sodium, Chloride, Fluoride, Dissolved Oxygen and Hydrazine Analyzers
- Zirconia Oxygen Analyzers, Katharometers, Hydrogen Purity and Purge-gas Monitors, Thermal Conductivity

## Customer Support

We provide a comprehensive after sales service via a Worldwide Service Organization. Contact one of the following offices for details on your nearest Service and Repair Centre.

### United Kingdom

ABB Limited  
Tel: +44 (0)1453 826661  
Fax: +44 (0)1453 829671

### United States of America

ABB Inc.  
Tel: +1 775 850 4800  
Fax: +1 775 850 4808

### Client Warranty

Prior to installation, the equipment referred to in this manual must be stored in a clean, dry environment, in accordance with the Company's published specification.

Periodic checks must be made on the equipment's condition. In the event of a failure under warranty, the following documentation must be provided as substantiation:

1. A listing evidencing process operation and alarm logs at time of failure.
2. Copies of all storage, installation, operating and maintenance records relating to the alleged faulty unit.

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