

Configuration Frame and Parameter Assignment Frame for the ET 200M

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You **don't** need the information contained in this chapter if you configure and parameterize the ET 200M with *STEP 7* or with *COM PROFIBUS*.

You **don't** need the information contained in this chapter if you integrate the device master file of the IM 153-x in your configuration tool, and then configure and parameterize the ET 200M using the configuration tool.

You only **need** the information in the following cases:

- If you don't use a configuration tool to create the configuration and parameter assignment frames.
- If you want to monitor the configuration and parameter assignment frames with a bus monitor.

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Declaration

In the following, IM 153-x stands for the IM 153-1, IM 153-2/-2 FO and IM 153-3.

Scope of Validity

This information is valid for the following IM 153-x:

IM 153-1 as of 6ES7 153-1AAx2-0XB0, version 01
IM 153-2 as of 6ES7 153-2AA02-0XB0, version 01
IM 153-2 FO as of 6ES7 153-2ABx1-0XB0, version 01
IM 153-3 as of 6ES7 153-3AA01-0XB0, version 01

1.1 Structure of the Configuration Frame

Structure of the Configuration Frame

The length of the configuration frame is dependent on the number of S7-300 modules connected to an ET 200M.

Table 1-1 Structure of the Configuration Frame

Slot	Byte				
	n	n + 1	n + 2	n + 3	n + 4
1st slot – power supply (n = 0)	04	00	00	AD	C4
2nd slot – • IM 153-1/-2/-3 (n = 5)	04	00	00	8B	41
3rd slot (reserved) (n = 10)	04	00	00	8F	C0
4th slot – 1st S7-300 module (n = 15)	See device master file				
5th slot – 2nd S7-300 module (n = 20)					
...					
11th slot – 8th S7-300 module (n = 50)					

Identifiers of the Modules

You can find the identifiers in the device master file of each IM 153-x.

You can find the current device master files on the Internet at
http://www.ad.siemens.de/csi_e/gsd.

For example, you will find the following entry in the device master file for the SM 321; DI 8 × AC 120/230V digital input module:

6ES7 321-1FF01-0AA0 8DE: 43 00 00 9F C1_H

In a configuration with the "module change during operation" function, a **vacant slot** has the identifier 04 00 00 8F C0_H.

Example of a Configuration Frame

An ET 200M configuration might comprise:

- A power supply
- An IM 153-1
- An S7-300 module (order number 6ES7 332-5RD00-0AB0).

The configuration frame thus consists of 20 bytes and has the following structure:

04 00 00 AD C4	04 00 00 8B 41	04 00 00 8F C0	83 43 00 25 E0
Power supply	IM 153-1	Reserved for vacant 3rd slot (see Table 1-1)	S7-300 module

1.2 Structure of the Parameter Assignment Frame

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Definition: Parameter Assignment Frame

The parameter assignment frame contains all the parameterizable values of a DP slave. The frame has a maximum length of 178 bytes.

Definition: Channel Group

The input and output channels of digital and analog modules are combined to form channel groups. Consequently, you can only parameterize the channels in groups.

There are fixed channel/channel group assignments, depending on the type of the digital/analog module. These assignments are listed in the *Module Specifications Reference Manual*.

Parameters You Can Set

In this section you can find **all** the parameters that can be set for the modules.

Before you assign parameters, check which of these parameters you can set for each of your modules (see the *Module Specifications* and *Intrinsically Safe I/O Modules Reference Manuals*)

Generally the following applies: Activate a parameter by setting the corresponding bit to "1" (unless otherwise specified).

Structure of the Parameter Assignment Frame

The length of the parameter assignment frame depends on the number of **parameterizable** modules in an ET 200M:

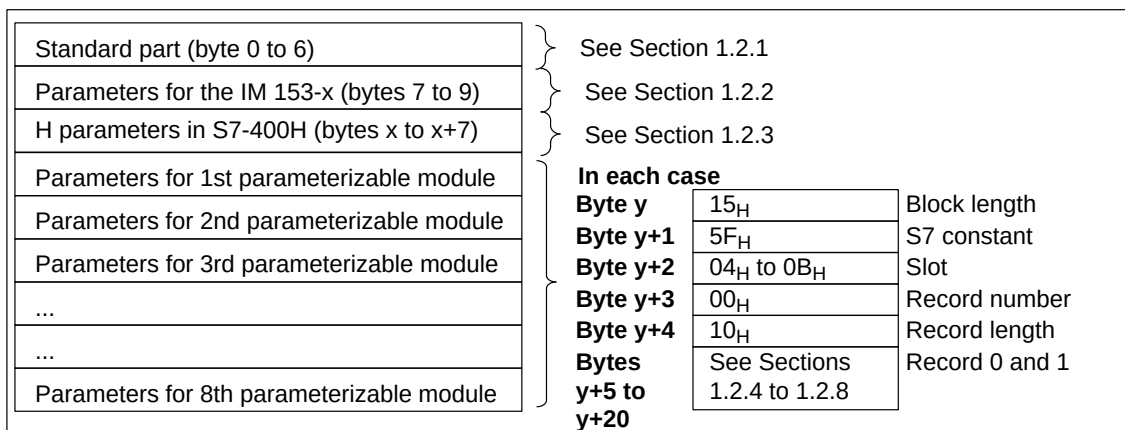


Figure 1-1 Structure of the Parameter Assignment Frame

Enabling Interrupts

Diagnostic and process interrupts are enabled hierarchically.

You must enable the diagnostic and process interrupts in both the IM 153-x (byte 8) and the modules (records 0 and 1).

If you don't want to evaluate any diagnostic, process, module removal or module insertion interrupts with the ET 200M, simply set the diagnostic interrupt enable, the process interrupt enable and the module removal/insertion interrupt enable of the IM 153-x to "0".

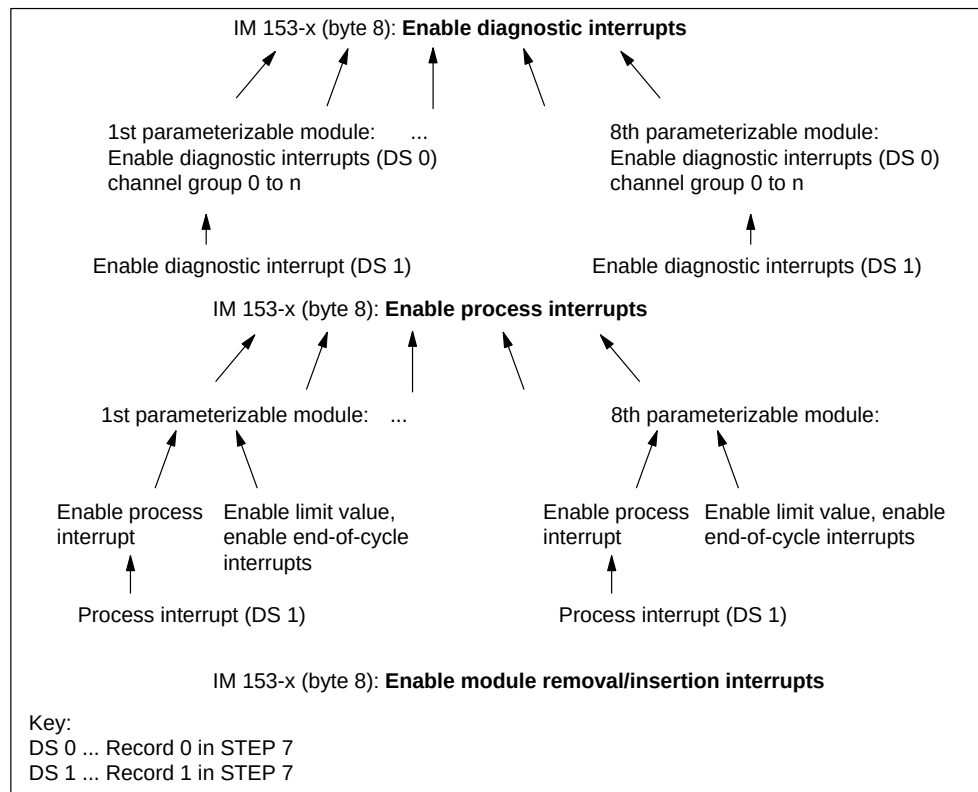


Figure 1-2 Enabling Interrupts

1.2.1 Standard Part of the Parameter Assignment Frame

Standard Part

The first 7 bytes of the parameter assignment frame are standardized to EN 50170, Volume 2, PROFIBUS and have the following contents for the IM 153-x (example):

Byte 0	08 _H	Station status
Byte 1	01 _H	WD factor 1
Byte 2	06 _H	WD factor 2
Byte 3	0B _H	T _{RDY}
Byte 4	80 _H	Manufacturer ID, high byte;
Byte 5	1D _H	Manufacturer ID, low byte
Byte 6	00 _H	Group ID

Figure 1-3 Standard Part of the Parameter Assignment Frame

1.2.2 Parameters for the IM 153-x

Structure of the Parameters for the IM 153-x

The parameters for the IM 153-x have a length of 3 bytes. The default setting of these 3 bytes is as follows: 40_H 60_H 00_H.

Note: If you enable diagnostic interrupts and process interrupts for the modules (see Sections 1.2.4 to 1.2.8), you must also enable them for the IM 153-x (see Figure 1-4)!

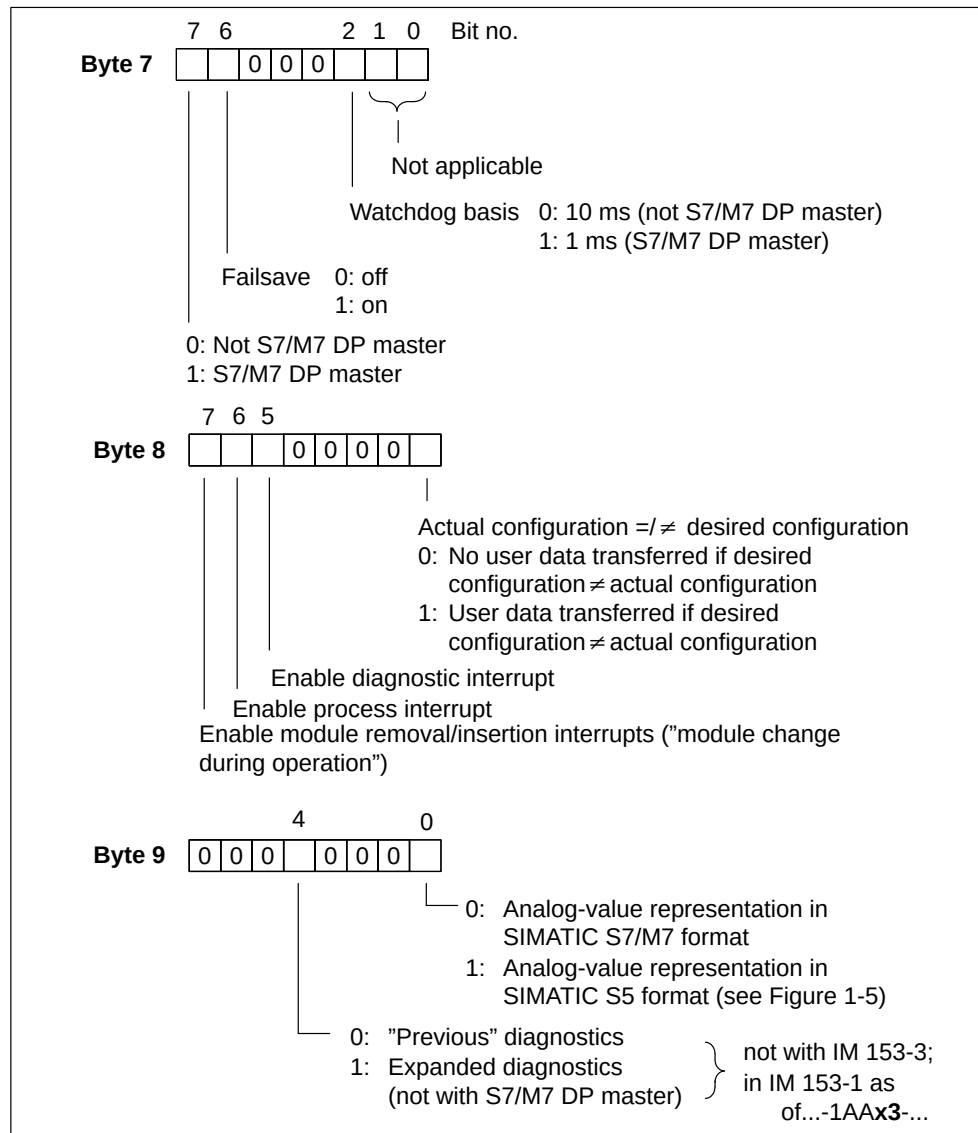


Figure 1-4 Parameters for the IM 153-x

Analog-Value Representation in SIMATIC S5

In a SIMATIC S5 programmable logic controller, the analog values of the S7-300 modules can be represented in SIMATIC S5. In other words, bit numbers 0, 1 and 2 in the low byte of the analog value refer to the X (irrelevant bits), F (error) and Ü (overflow) bits.

The representation of the analog values may be parameterized (see Figure 1-4).

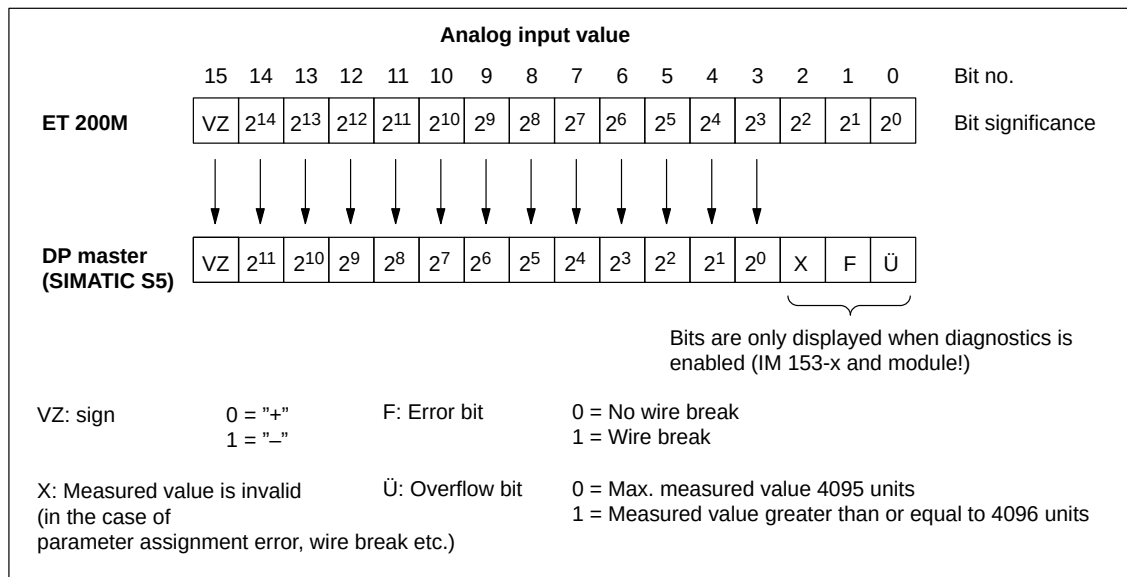


Figure 1-5 Analog-Value Representation in SIMATIC S5

1.2.3 H Parameter Assignment Command (only with S7-400H)

The H parameter assignment command is only a part of the parameter assignment frame if you operate the ET 200M on an S7-400H system and configure the H system with *STEP 7*.

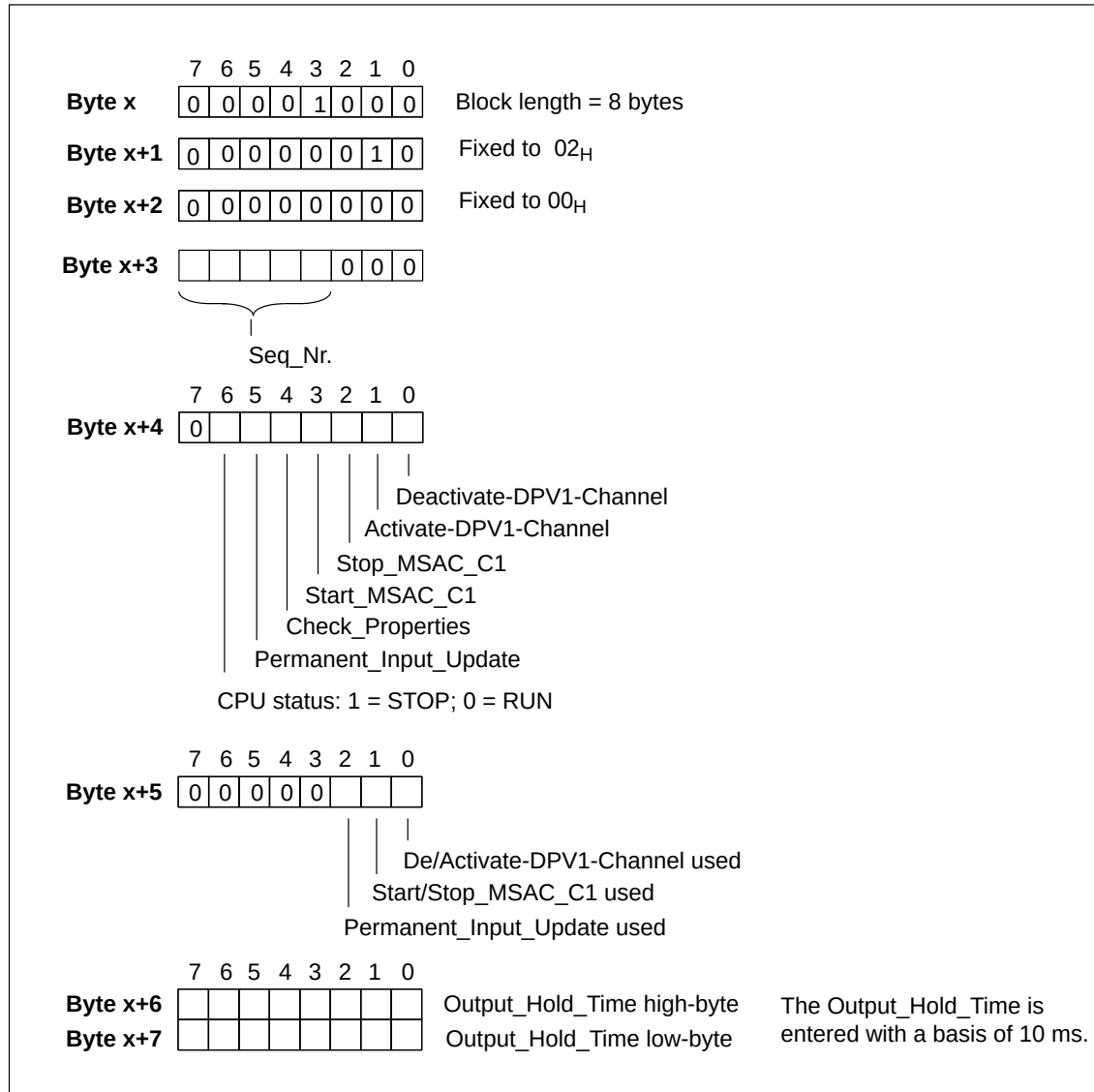


Figure 1-6 H Parameter Assignment Command (only with S7-400H)

1.2.4 Parameters for Digital Input Modules

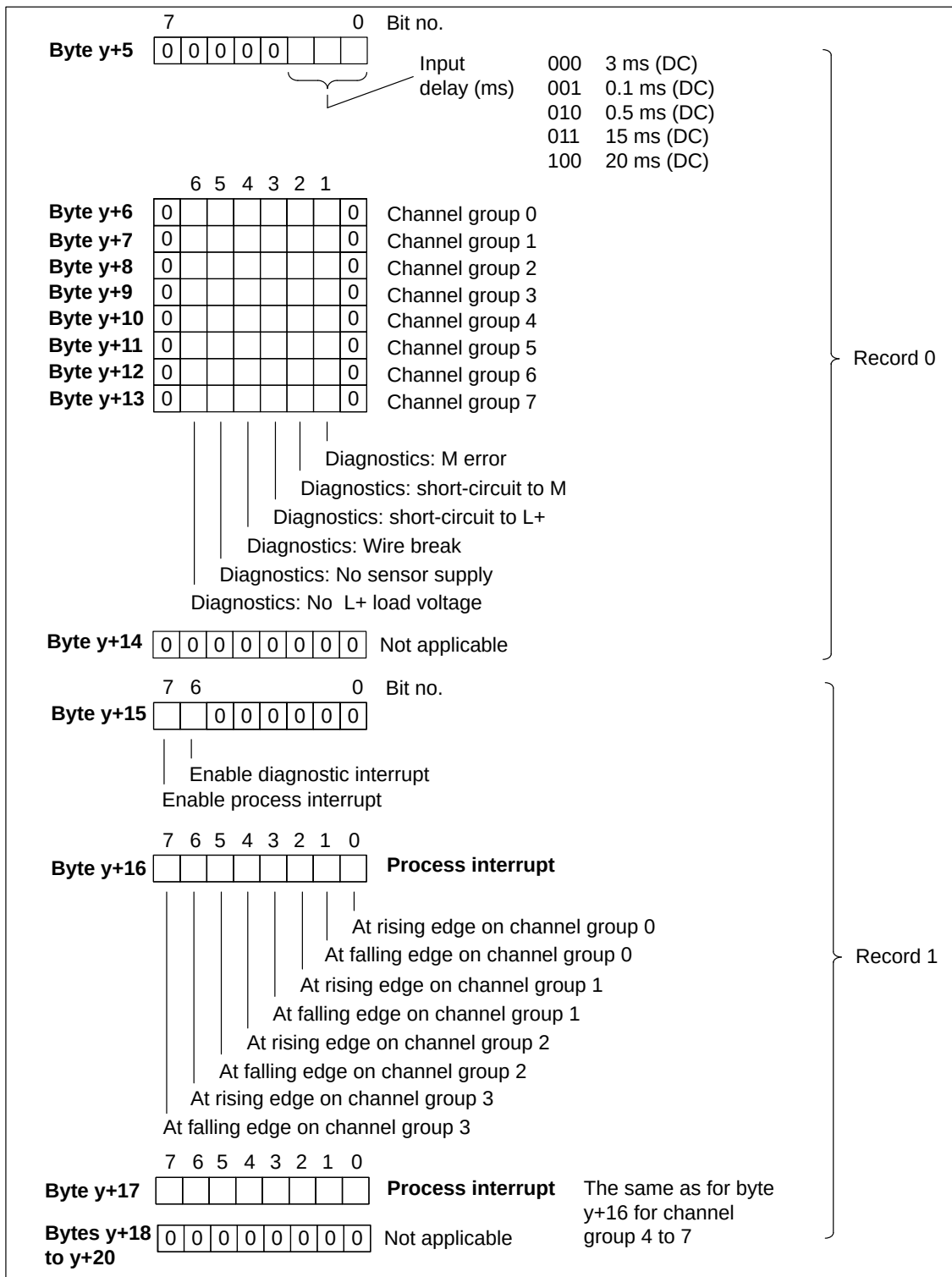


Figure 1-7 Parameters of the Digital Input Modules (Records 0 and 1)

1.2.5 Parameters for Digital Output Modules

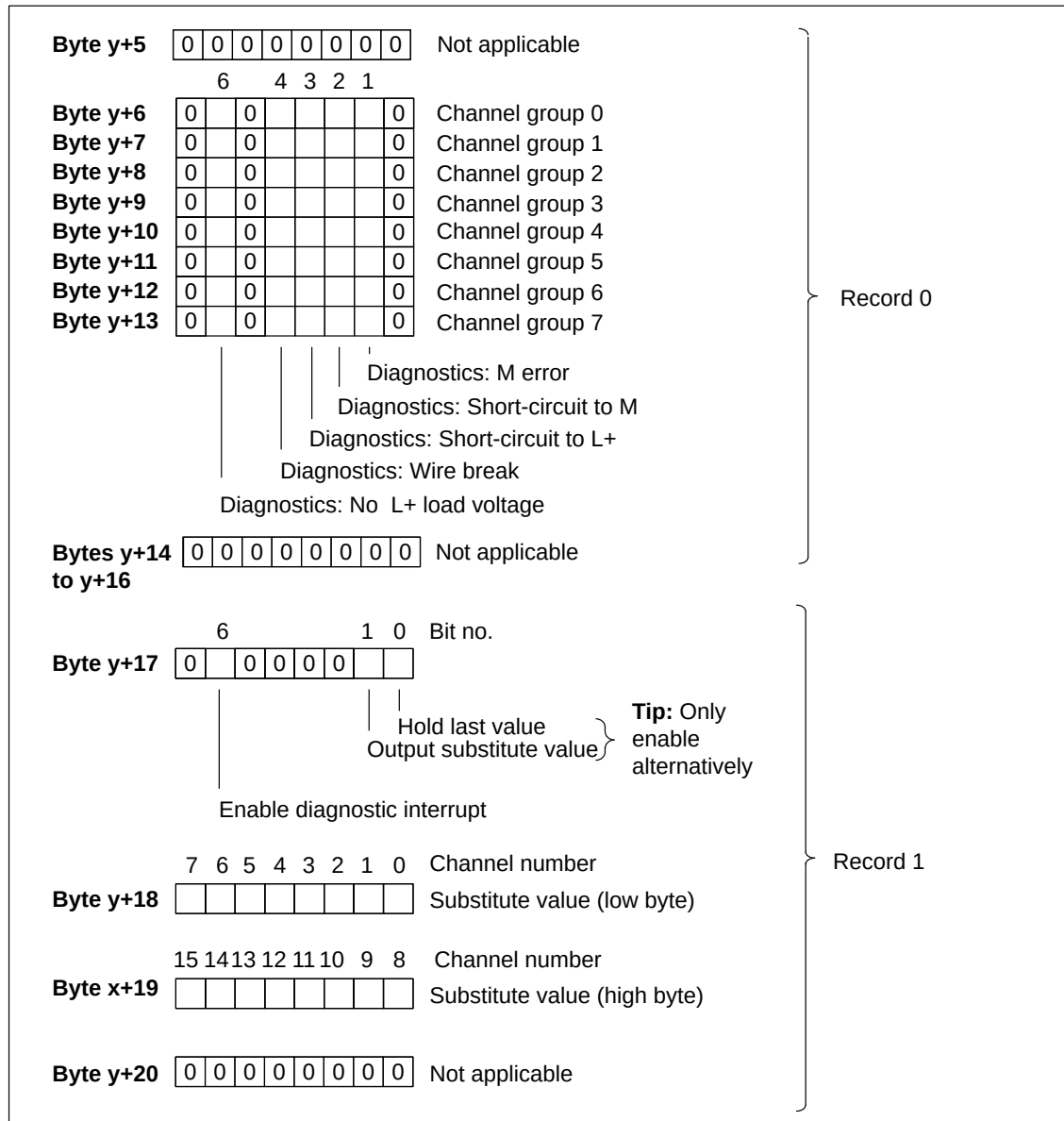


Figure 1-8 Parameters of the Digital Output Modules (Records 0 and 1)

1.2.6 Parameters for Digital Input/Output Modules

Structure of Record 0

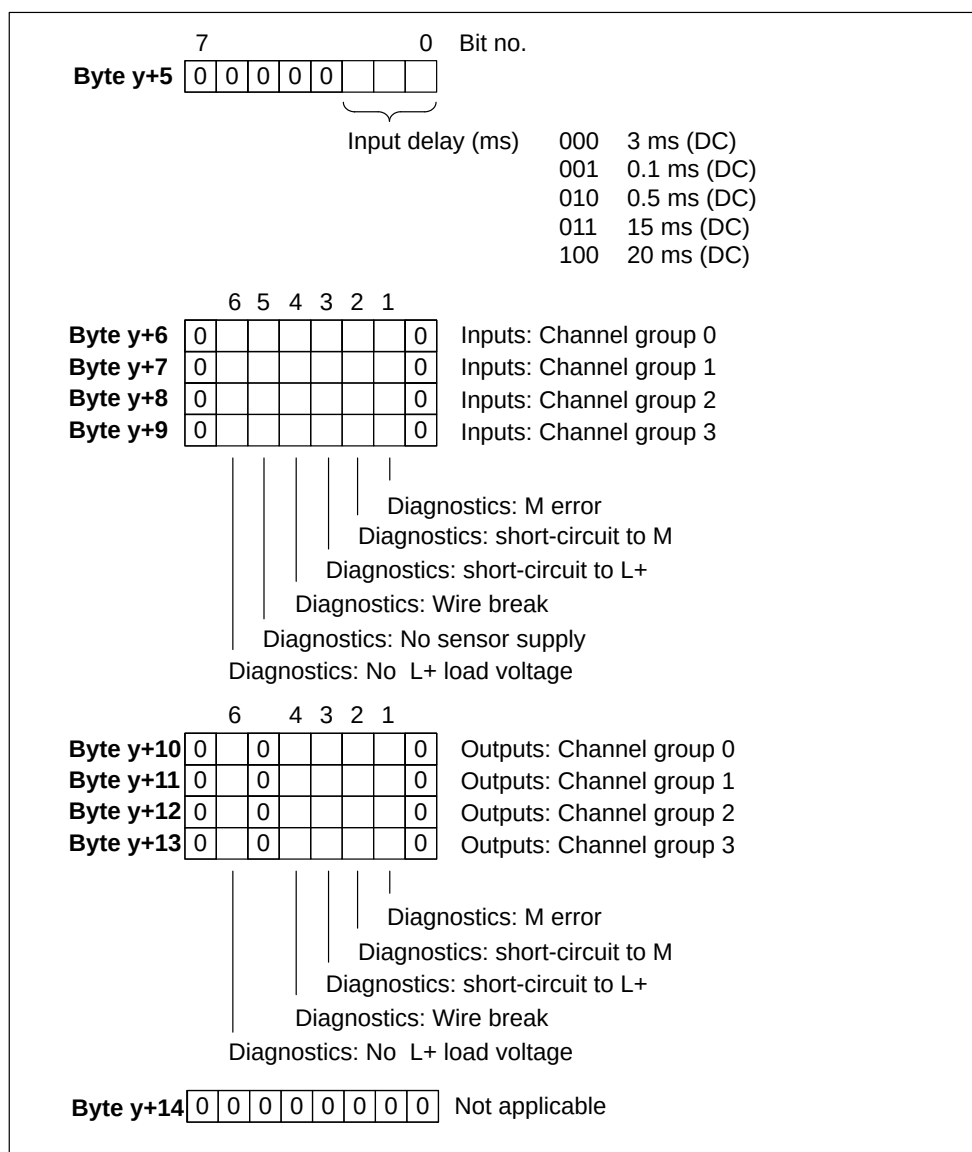


Figure 1-9 Parameters of the Digital Input/Output Modules (Record 0)

Structure of Record 1

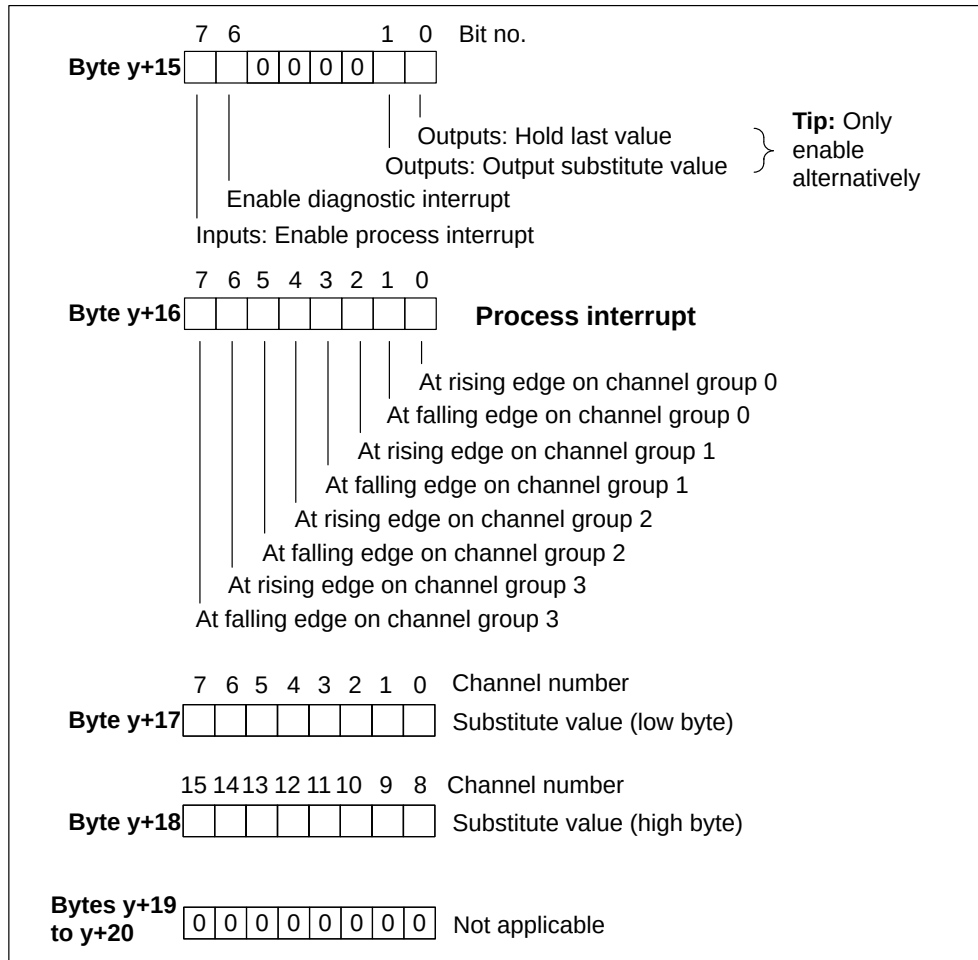


Figure 1-10 Parameters of the Digital Input/Output Modules (Record 1)

1.2.7 Parameters for Analog Input Modules

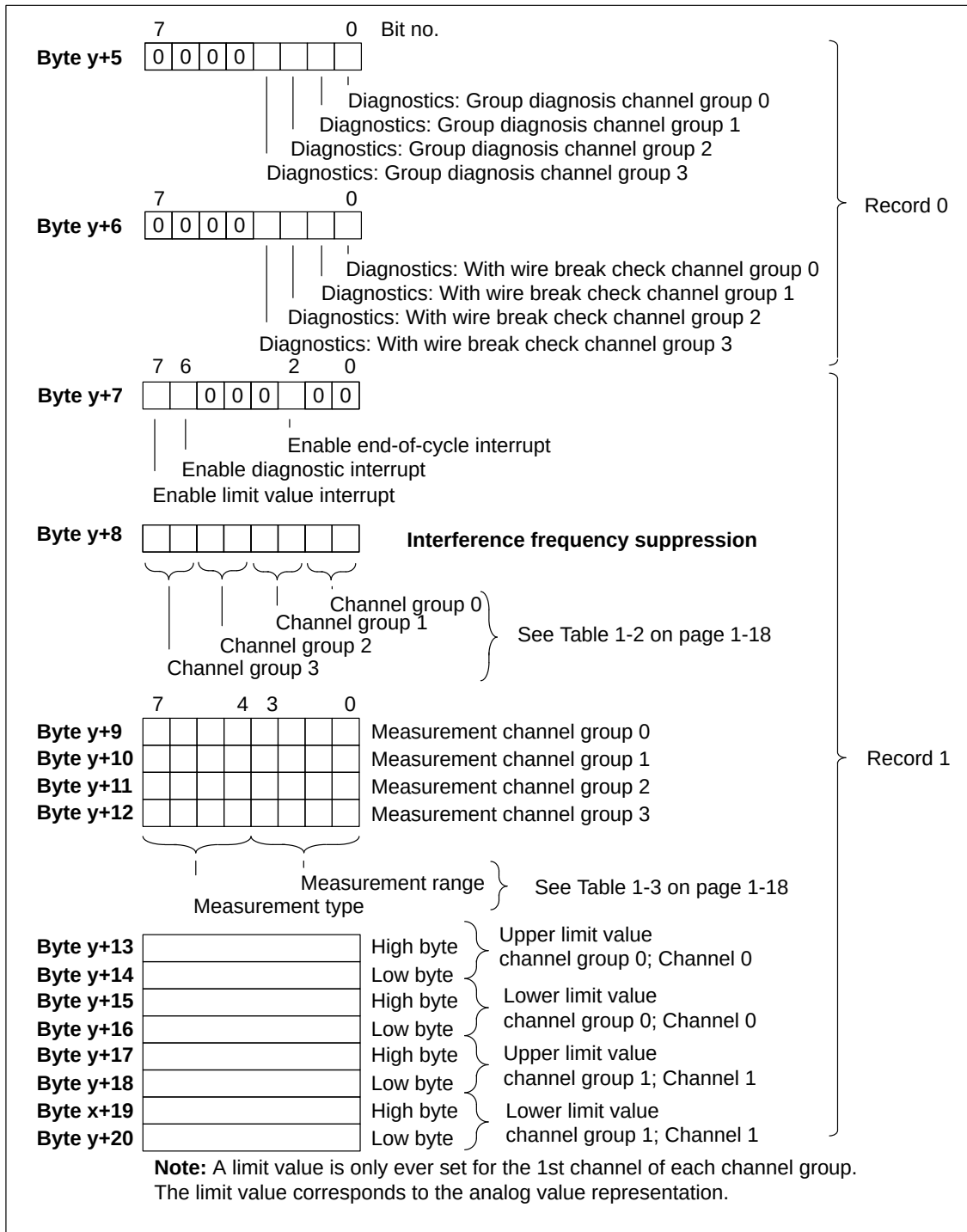


Figure 1-11 Parameters of the Analog Input Modules (Records 0 and 1)

1.2.8 Parameters for Analog Output Modules

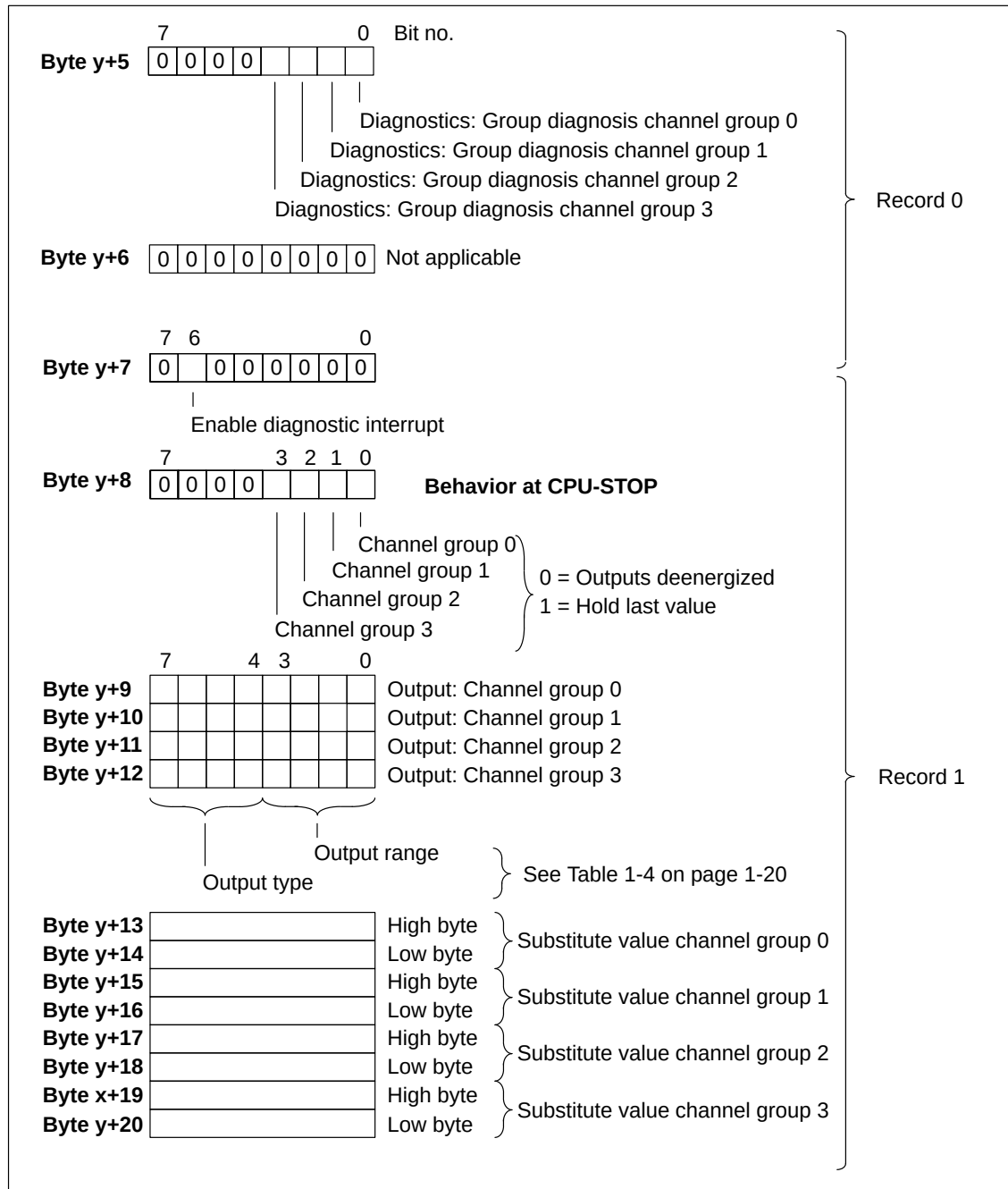


Figure 1-12 Parameters of the Analog Output Modules (Records 0 and 1)

1.2.9 Parameters for Analog Input/Output Modules

Structure of Record 0

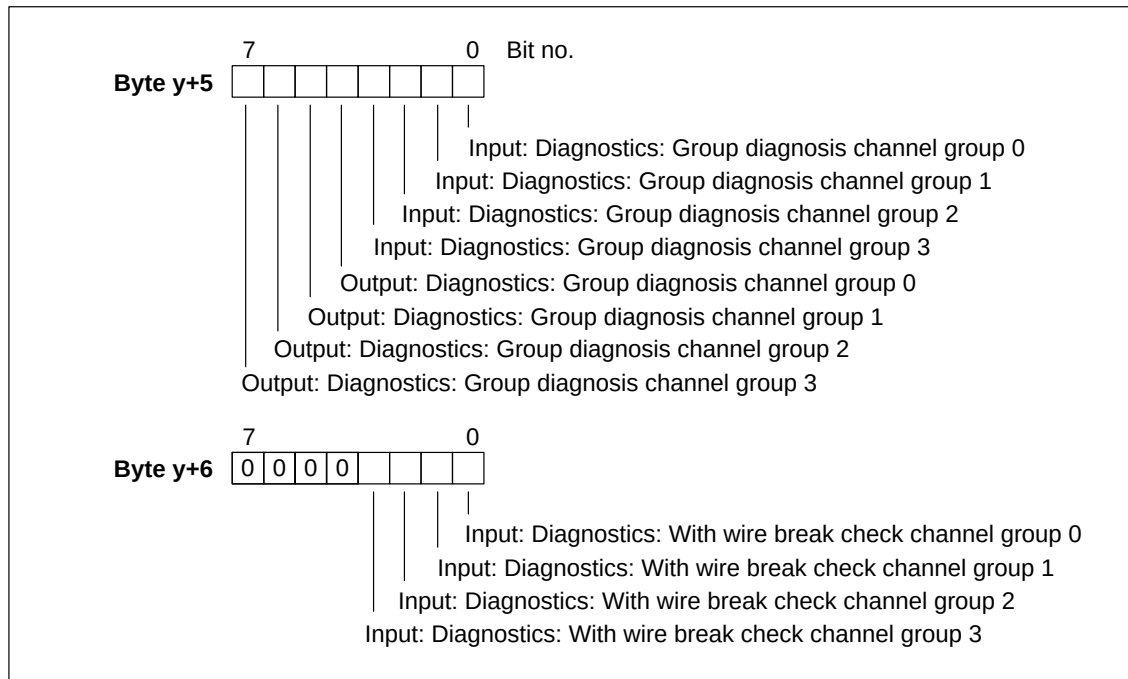


Figure 1-13 Parameters of the Analog Input/Output Modules (Record 0)

Structure of Record 1

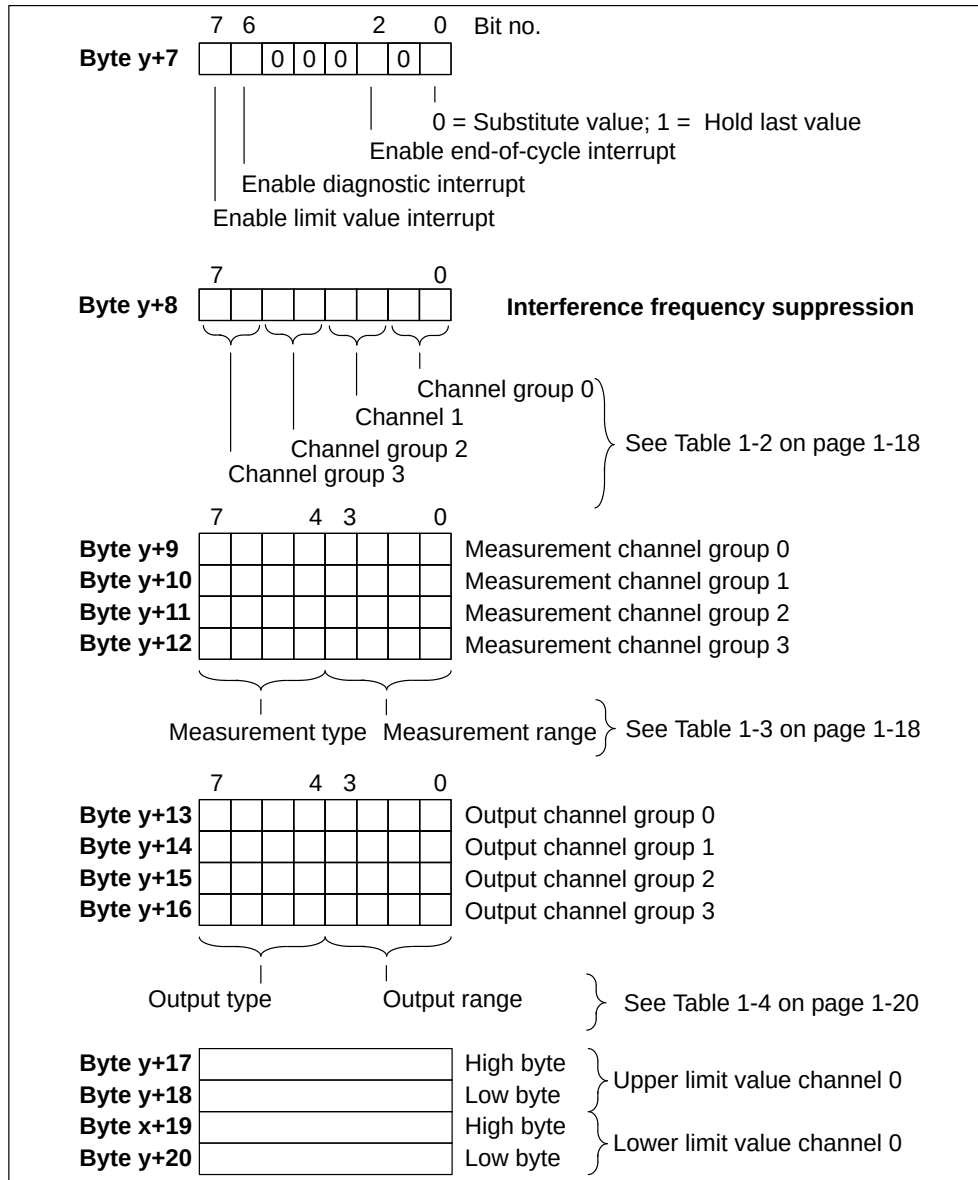


Figure 1-14 Parameters of the Analog Input/Output Modules (Record 1)

1.2.10 Measurement Range and Output Range of the Analog Modules

Interference Frequency Suppression

Table 1-2 shows the codes for the various frequencies that you can enter in byte y+8 of record 1 (see Figures 1-11 and 1-14). You must calculate the resulting integration time for each channel!

Table 1-2 Codes for Interference Frequency Suppression of the Analog Input Modules

Interference Frequency Suppression	Integration Time	Code
400 Hz	2.5 ms	2#00
60 Hz	16.7 ms	2#01
50 Hz	20 ms	2#10
10 Hz	100 ms	2#11

Measurement Type and Measurement Ranges

Table 1-3 shows all the measurement ranges of the analog input modules. It also contains the codes for the various measurement types and measurement ranges. You must enter these codes in bytes y+9 to y+12 of record 1, depending on the measurement range you want to set (see Figures 1-11 and 1-14).

Note

Don't forget that depending on the measurement range you might have to rearrange a measurement range module on the analog input module.

Table 1-3 Codes for the Measurement Ranges of the Analog Input Modules

Measurement Type	Code (Bits 4 to 7)	Measurement Range	Code (Bits 0 to 3)
Deactivated	2#0000	Deactivated	2#0000
Voltage	2#0001	± 80 mV ± 250 mV ± 500 mV ± 1 V ± 2.5 V ± 5 V 1 to 5 V ± 10 V ± 25 V ± 50 V	2#0001 2#0010 2#0011 2#0100 2#0101 2#0110 2#0111 2#1001 2#1010 2#1011

Table 1-3 Codes for the Measurement Ranges of the Analog Input Modules, continued

Measurement Type	Code (Bits 4 to 7)	Measurement Range	Code (Bits 0 to 3)
4-wire measuring transducer	2#0010	± 3.2 mA ± 10 mA 0 to 20 mA 4 to 20 mA ± 20 mA ± 5 mA	2#0000 2#0001 2#0010 2#0011 2#0100 2#0101
2-wire measuring transducer	2#0011	4 to 20 mA	2#0011
Resistance 4-wire connection	2#0100	150 Ω 300 Ω 600 Ω	2#0010 2#0100 2#0110
Resistance 4-wire connection 100 Ω compensation	2#0110	52 to 148 Ω 250 Ω 400 Ω 700 Ω	2#0001 2#0011 2#0101 2#0111
Thermal resistance + linearization 4-wire connection	2#1000	Pt 100 climatic Ni 100 climatic Pt 100 standard range Pt 200 standard range Pt 500 standard range Pt 1000 standard range Ni 1000 standard range Pt 200 climatic Pt 500 climatic Pt 1000 climatic Ni 1000 climatic Ni 100 standard range	2#0000 2#0001 2#0010 2#0011 2#0100 2#0101 2#0110 2#0111 2#1000 2#1001 2#1001 2#1011
Thermocouples internal comparison	2#1010	Type B [PtRh – PtRh] Type N [NiCrSi – NiSi]	2#0000 2#0001
Thermocouples external comparison	2#1011	Type E [NiCr – CuNi] Type R [PtRh – Pt] Type S [PtRh – Pt]	2#0010 2#0011 2#0100
Thermocouples + linearization internal comparison	2#1101	Type J [Fe – CuNi IEC] Type L [Fe – CuNi] Type T [Cu – CuNi]	2#0101 2#0110 2#0111
Thermocouples + linearization external comparison	2#1110	Type K [NiCr – Ni] Type U [Cu – Cu Ni]	2#1000 2#1001

Output Type and Output Ranges

Table 1-4 shows all the output ranges of the analog output modules. It also contains the codes for the output type and the respective output range. You must enter these codes in the corresponding bytes of record 1, depending on the output range you want to set (see Figures 1-12 and 1-14).

Table 1-4 Codes for the Output Ranges of the Analog Output Modules

Output Type	Code (Bits 4 to 7)	Output Range	Code (Bits 0 to 3)
Deactivated	2#0000	Deactivated	2#0000
Voltage	2#0001	1 to 5 V 0 to 10 V ± 10 V	2#0111 2#1000 2#1001
Current	2#0010	0 to 20 mA 4 to 20 mA ± 20 mA	2#0010 2#0011 2#0100