FACTORY AUTOMATION

Manual

IVT-HH9-R5

Read/write attachment
for PSION Workabout MX

CE

PEPPERL+FUCHS

Date of issue 13.08.2003

1 Declaration of conformity

The Read/write attachment IVT-HH9-R5 for the PSION Workabout MX was developed and manufactured in compliance with applicable european standards and regulations.

Note

A corresponding declaration of conformity can be requested from the manufacturer.

The product manufacturer, Pepperl+Fuchs GmbH in D-68301 Mannheim, Germany, features a certified quality assurance system in compliance with ISO 9001.

CE

ISO9001

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2 The symbols used

Warning

This symbol provides a warning of a hazard.

Failure to heed this warning can lead to personal injury or death and/or damage to or destruction of equipment.

Attention

This symbol provides a warning of a potential fault.

If the instructions given in this warning are not heeded, the device and any plant or systems connected to it could develop a fault or even fail completely.

Note

This symbol points to important information.

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3 Safety

3.1 Intended use

The Read/write attachment IVT-HH9-R5 is part of the inductive identification system IDENT-I System V by Pepperl+Fuchs. In connection with the PSION Workabout MX, the attachment will read and write the code and data carriers of this system.

Warning

If the device is not used according to its intended use, the protection of the operational staff and the plant cannot be guaranteed.

The device may be operated only by trained and instructed expert personnel and in compliance with the associated instruction manual.

3.2 General Safety Instructions

Warning

Any operation other than that described in this instruction manual puts the safety and operating functions of the device and any connected systems at risk.

Repairs may be performed at the manufacturer's only. No changes and operations made to the device are permitted and will render any warrantee claim void.

The operator is responsible for complying with the locally applicable safety regulations.

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4 Product Description

4.1 Product Family

The inductive identification system IDENT-I System V by Pepperl+Fuchs, to which Read/write attachment IVT-HH9-R5 belongs offers various possibilities of combining the individual components within the system with one another.

Figure 4.1: Components of the inductive identification system IDENT-I System V.

The Read/write attachment IVT-HH9-R5 is also available together with the PSION Workabout MX IPZ-WA and the related operating software in the form of a complete hand/held read/write device IVT-HH9.

Figure 4.2: Complete Hand-Held Read/Write Device IVT-HH9

Note

For detailed information on the components of the IDENT-I System V identification system, please refer to the Sensor Systems 1 catalogue.

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4.2 Areas of Application

The Read/write attachment IVT-HH9-R5 for the PSION Workabout MX has been designed for mobile applications and is especially well suited for data acquisition on site due to its convenience of handling.

Examples of areas of application

- Inspection
- Maintenance or
- Parameterisation

The IVT-HH9-R5 can be used to access all the Pepperl+Fuchs code and data carriers of the IDENT-I System V.

The device provides all the essential standard functions for reading and writing. In addition, the user can write his/her own programs and thus optimally adapt the application to each and every situation.

4.3 Delivery Package/Accessories

The following is included in the delivery package:

- 1 Read/write attachment IVT-HH9-R5
- 1 manual on CD-ROM

Note

The PSION Workabout MX must be ordered separately.

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5 Installation

5.1 Storage and Transportation

For storage and transportation, the device must be packaged such that it is protected against impacts and humidity. The original packing provides optimum protection.

In addition, the permissible ambient conditions must be heeded (see Technical Data).

5.2 Unpacking

Make sure the contents is undamaged. If anything is damaged, give notice to the carrier or haulage contractor and notify the supplier.

Check the delivery package for the following according to your order and the shipping documents:

- Delivery Quantity
- Device type and design according to the type label.
- Accessories
- Manual/Manuals

Save the original packing, in case the device needs to be stored or shipped later on.

If you have any questions, please revert to Pepperl+Fuchs.

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5.3 Mounting the Device

To avoid potential damage to the PSION Workabout MX you should switch off the PSION Workabout MX before mounting the Read/write attachment.

Note

Connect the Read/write attachment to the PSION Workabout MX in such a way that the interface of the Read/write attachment fits onto the TTL interface of the PSION Workabout MX.

Connect the two devices by screwing in the two Phillips head screws using a suitable screwdriver.

To not tighten the screws excessively. If you have tightened the screws excessively, the counterpart may also be screwed out of the housing of the PSION Workabout MX when demounting the device later on.

Attention

Figure 5.1: Mounting the Read/Write Attachment Using a Screwdriver

5.4 Demounting the Device

To avoid potential damage to the PSION Workabout MX you should switch off the PSION Workabout MX before demounting the Read/write attachment.

Note

To demount the Read/write attachment, unscrew the two Phillips head screws and pull the device off thePSION Workabout MX.

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5.5 Packaging and Disposing of the Device

5.5.1 Repackaging the Device

For later use, the device must be packaged such that it is protected against impacts and humidity.The original packing provides optimum protection.

5.5.2 Disposal of the Device

Note

Electronic scrap is hazardous waste. Please heed the local regulations for disposal of hazardous waste.

The Read/write attachment IVT-HH9-R5 does not include any batteries that need to be removed before disposing of it.

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6 Commissioning

Switch on the PSION Workabout MX. When you switch on the PSION Workabout MX for the first time, the System Screen will be displayed.

Figure 6.1: PSION Workabout MX System Screen

Press Menu to call the System Interface, select the "System screen" menu option using the arrow keys ↑ ↓ and confirm your selection by pressing Enter. Various icons relating to the various programs installed will be displayed.

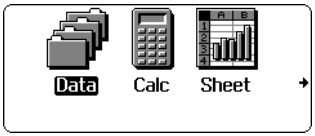

Figure 6.2: Change to "System screen", display of the icons of the various programs

To use the Read/write attachment, you have to start the "Comms" program. To this end, navigate to the "Comms" icon using the arrow keys ← → and start the program by pressing Enter. The program will start with a blank display.

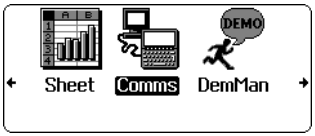

Figure 6.3: Starting the "Comms" Program with a Blank Display

In the display on the lower right-hand side, the "Port TTY:Port A online..." message will be displayed briefly.

To be able to use the IVT-HH9-R5, you first have to switch on the voltage supply and set the correct parameters.

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To be able to activate the power supply for the Read/write attachment and to guarantee trouble-free communication via the TTL interface, the correct port with the correct transfer rate must be enabled. Call the menu by pressing Menu. Use the arrow keys ← → to select the "Spec" tab and then the arrow keys ↑ ↓ to select the "Port" menu option. Press Enter to confirm your selection.Using the arrow keys →, you can select the correct setting "Port D" and the baud rate of "38400" and confirm your selection by pressing Enter.

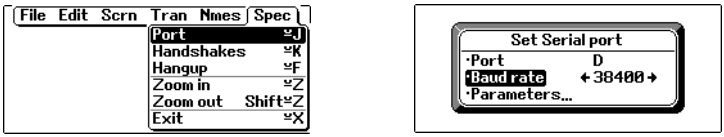

Figure 6.4: Setting the correct interface parameters

The startup message '22' of the read/write attachment will be displayed.

Figure 6.5: Startup Message of the Read/Write Attachment IVT-HH9-R5

Please also switch off the RTS/CTS of the handshake for trouble-free communication.

Call the menu by pressing Menu. Using the arrow keys ← →, select the "Spec" tab and then the "Handshake" menu option using the arrow keys ↑ ↓. Press Enter to confirm your selection. Select the correct setting "RTS/CTS Off" using the arrow keys → and confirm your selection by pressing Enter.

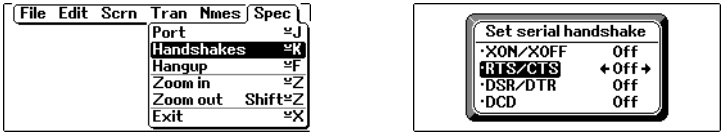

Figure 6.6: Setting the Correct Handshake

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For a complete screen display of the communication, you have to enable the echo function.

Call the menu by pressing Menu. Using the arrow keys ← →, select the "Scrn" tag and then the "Options" menu option using the arrow keys ↑ ↓. Press Enter to confirm your selection. Using the arrow keys ← →, you can select the correct setting "Local echo On" and confirm your selection by pressing Enter.

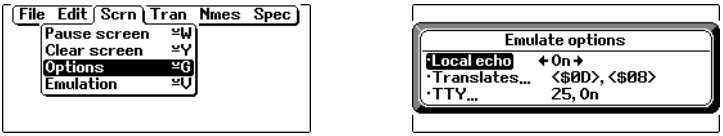

Figure 6.7: Setting the Echo

The selected settings can be saved in the "File" menu by selecting the "Save Setting Options" menu option.

Use the 've' version message to check whether you have performed the installation correctly.

Enter ve# Enter via the keyboard. If the commissioning procedure was correct, the version message of the Read/write attachment will be displayed.

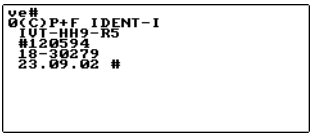

Figure 6.8: Versions Message of the IVT-HH9-R5 Read/Write Attachment

Note

Save the battery power of the PSION Workabout MX by switching off the voltage supply of the Read/write attachment when you are not using it.

The voltage supply of the Read/write attachment is switched off at the same time as the PSION Workabout MX is switched off.

Alternatively, it is also possible to select a different port (see the description of Figure 6.4) or exit the "Comms" program. To exit the program, call the menu by pressing Menu. Select the "Spec" register using the arrow keys ← → and then the "Exit" menu option using the arrow keys ↑ ↓. Press Enter to confirm your selection.

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7 Commands

7.1 Protocol with checksum

The device can be operated with two different end codes. Either with checksum <CHCK> and <ETX> (<ETX> = 03h) or without checksum with #<CR>. For simple operation, the Read/write attachment will also accept a #<CR> [<LF>] instead of a <CHCK><ETX>.

Note

Using the checksum increases data safety on the interface.

The checksum is calculated by adding all the previous characters without overflow.

Example for calculating the checksum:
The checksum is to be calculated for the telegram

VE#<CR> or ve#<CR>

without checksum. First, the hexadecimal values for the characters 'V'=56h and 'E'=45h or 'v'=76h and 'e'=65h are required from an ASCII table. Add these values to receive the result

'V' = 56h plus 'E' = 45h sums up to 9Bh or
'v' = 76h plus 'e' = 65h sums up to DBh.

The telegram of the checksum is then

VE<9Bh><ETX> or
ve<DBh><ETX>.

If a long telegram is to be transmitted, the checksum is likely to overflow, i. i. the value calculated through addition is too large to be represented in one byte. The pending overflow is not transmitted with the telegram. If the telegram

SR000702#<CR>

is to be transmitted with checksum, the following checksum results:

45h + 52h + 30h + 30h + 30h + 37h + 30h + 32h = 1C0h.

The following telegram with checksum results after the overflow has been cut off:

SR000702<C0h><ETX>.

Note

The device is not case sensitive, i.e. it is not important whether the commands are entered in upper-case or lower-case letters. Make sure, however, that there are different checksums for upper-case and lower-case entries.

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7.2 List of Commands

The commands listed are described in detail on the pages specified.

System commands

Description of Commands	Command	Page
Version	**VE**	Page 15
change tag	**CT**	Page 15
quit	**QU**	Page 15
reset	**RS**	Page 15

Fixcode commands

Description of Commands	Command	Page
single read Fixcode	**SF**	Page 16
buffered read Fixcode	**BF**	Page 16

Read/write commands

Description of Commands	Command	Page
single read	**SR**	Page 17
buffered read	**BR**	Page 17
single write	**SW**	Page 17
buffered write	**BW**	Page 17
single program Fixcode	**SX**	Page 18
buffered program Fixcode	**BX**	Page 18

Note

In the following descriptions, the commands are identified in boldface. Text in < ... > is descriptive text for the command string.

Note

The device is not case sensitive, i.e. it is not important whether the commands are entered in upper-case or lower-case letters. Make sure, however, that any parameters following the command are entered without a leading space.

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7.2.1 System commands

version:

Command: **VE**#<CR>
Answer: <Status> (C) P+F IDENT-I <CR><LF>
IVT-HH9-R5<CR><LF>
#<Part-Nr><CR><LF>
<SW-Nr><CR><LF>
<SW-Datum> #<CR>

This command transmits device designations and the software version number of the Read/write attachment.

change tag:

Command: **CT**<TagTyp>#<CR>
Answer: <Status>#<CR>

This command is used to inform the Read/write attachment of the data carrier type, with which it is to communicate.

The following data carrier types are supported:

<TagTyp>	Chip used	<WordAddr>	Bits
'1'	IDC-...-1k	0000h ... 003Fh	1k
'2'	IMC-40-64k	0000h ... 0FFFh	64k

Note

Fixcode commands are independent of the settings made with this command and work with ICC-... code carriers only.

When switching off the Read/write attachment, the setting is reset to the data carrier type <TagTyp>='1' (Default).

quit:

Command: **QU**#<CR>
Answer: <Status>#<CR>

The command issued in this Read/write attachment is aborted.

reset:

Command: **RS**#<CR>
Answer: 2#<CR>

A reset of the Read/write attachment causes an abort of all the active commands.

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7.2.2 Fixcode commands

The ICC-... code carriers used in the inductive fixcode system are assigned a unique code at their production. Of the 64 bits of the ROM mask-programmed during production, 28 bits are used as the code (fixcode), 20 bits as code protection and 16 bits are not used at all. The manufacturer guarantees that a code number is assigned only once.

Note

Fixcode commands are independent of the set data carrier type <TagTyp> and work with ICC-... only.

single read fixcode:

Command:	**SF**#<CR>
Answer:	<Status><Daten>#<CR>

Exactly one attempt is made to read a fixcode.

buffered read fixcode:

Command:	**BF**#<CR>
Answer:	<Status><Daten>#<CR>

Constant attempts are made to read a fixcode. In this case, only data of changing data carriers are transmitted. This means, data carriers are not read out twice.

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7.2.3 Read/write commands

Data carriers with SRAM or EEPROM are used for read/write systems. Depending on the data carrier type, the size of the memory differs from 1 kBit to 64 kBit, which corresponds to an address space of from 64$_d$ to 4096$_d$ words. The read/write commands always read or write the data in units of 1 word.

single read:

Command:	**SR**<WordAddr><WordNum>#<CR>
Answer:	<Status><Daten>#<CR>

Exactly one attempt is made to read <WordNum> words starting at address <WordAddr>.

buffered read:

Command:	**BR**<WordAddr><WordNum>#<CR>
Answer:	<Status><Daten>#<CR>

Constant attempts are made to read <WordNum> words starting at address <WordAddr>. In this case, only data of changing data carriers are transmitted. This means, data carriers are not read out twice.

single write:

Command:	**SW**<WordAddr><WordNum><Daten>#<CR>
Answer:	<Status>#<CR>

Exactly one attempt is made to write <WordNum> words starting at address <WordAddr>.

buffered write:

Command:	**BW**<WordAddr><WordNum><Daten>#<CR>
Answer:	<Status>#<CR>

Constant attempts are made to write <WordNum> words starting at address <WordAddr>. After each write operation, the status is evaluated and the program waits until a new data carrier is in the sensing range. This means, data carriers are not written twice. Thereafter, the command will be executed again.

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Programming a Fixcode for the Data Carrier

For various applications it is desirable to use code carriers with identical codes or to replace defective code carriers with new ones while keeping the code of the old code carrier.

In applications of this kind, it must be possible to use a mixture of writable data carriers and code carries. In the read/write system, however, there are separate commands for reading data and code carriers. A read command for data carriers does not read code carriers, and vice versa. Using the "program Fixcode" commands, data carriers can be assigned a code that lets the fixcode system read the data carrier like a code carrier.

single program fixcode:

Command: **SX**0107<FixDaten>#<CR>
Answer: <Status>#<CR>

Note

This command can be used with data carrier type IDC-...-1k only.

Exactly one attempt is made to program the fixcode. The <FixDaten> must have a length of exactly 7 characters and consist of exactly 3 hexadecimal numbers (0_h ... F_h) and 4 decimal numbers (0_d ... 9_d). Example: "ABC1234".

7 characters must be entered. If too few or illegal characters are entered, a fault signal will be issued.

buffered program fixcode:

Command: **BX**0107<FixDaten>#<CR>
Answer: <Status>#<CR>

Note

This command can be used with data carrier type IDC-...-1k only.

Constant attempts are made to program the fixcode. After each write operation, the status is evaluated and the program waits until a new data carrier is in the sensing range. This means, data carriers are not written twice. Thereafter, the command will be executed again.

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7.3 Legend

<CHCK> : 1 byte HEX, 8 bit checksum by adding all the previous characters, without overflow.

<CR> : 1 ASCII character, 13_d, 'carriage return' corresponds to Enter.

<Daten> : <WordNum> multiplied with 2 ASCII characters, or length of the fixcode

<ETX> : 1 ASCII character, 03_d, 'end of text'

<FixDaten> : 7 characters, exactly 3 hexadecimal characters (0_h ... F_h) and 4 decimal numbers (0_d ... 9_d). Example: "ABC1234"

<LF> : 1 ASCII character, 10_d, 'line feed'

<Part-Nr> : 6 ASCII characters from '0' to '9', item no.

<Status> : 1 ASCII character

<Status>	Error
'0'	No error
'1'	Low battery power
'2'	Startup message, device is ready to operate
'4'	Incorrect or incomplete command or parameter not within the permissible range
'5'	Read or write error
'6'	Hardware error, read/write head defective

<SW-Nr> : Software number of the application software

<SW-Datum> : 6 ASCII characters from '0' to '9' in the format DDMMYY, Version date of the application software

<TagTyp> : 1 ASCII character, type of data carrier
(Fixcode commands are independent of the data carrier type set and work with ICC-... code carriers only)

<TagTyp>	Chip used	<WordAddr>	Bits
'1'	IDC-...-1k	0000_h ... $003F_h$	1k
'2'	IMC-40-64k	0000_h ... $0FFF_h$	64k

Example of a conversion:
64 kBit = 8 kByte = 8192 Byte = 4096 Word
=> 1000_h addresses from 0000_h ... $0FFF_h$

<WordAddr> : 2 ASCII characters, beginning-of-word address in<TagTyp>, in the range of from '0000_h' to '$003F_h$' or '0000_h' to '$0FFF_h$' depending on the <TagTyp>

<WordNum> : 2 ASCII characters, the number of the words to read or write, in the range of from '01' to '40'.

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8 Technical Data

8.1 Dimensions

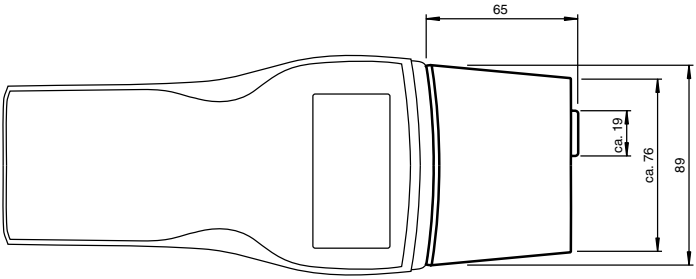

Figure 8.1: Outer dimensions

8.2 Interfaces

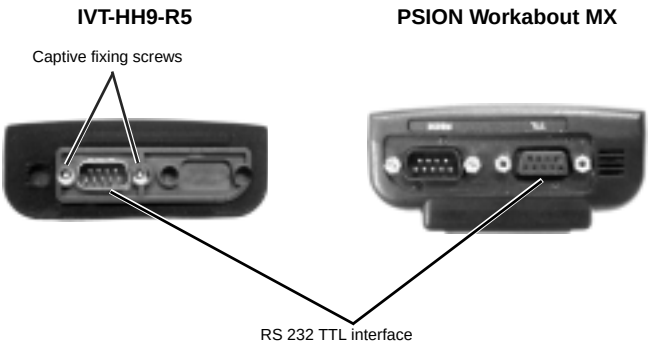

Figure 8.2: Location and designation of the interfaces

8.3 Read/write positions

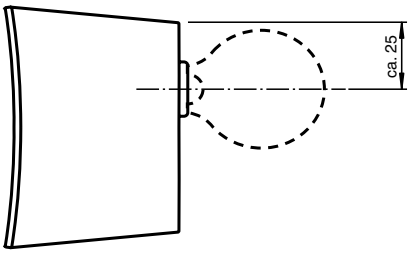

Figure 8.3: Position of the fitted read/write head

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8.4 Technical Specifications

Serial interface	
Type	RS 232 TTL
Transfer rates	38400 baud, 8 data bits, Parity none, 1 stop bit, RTS/CTS off
Protocol	P+F Talk

Electrical Data	
the power supply	5 V DC from PSION Workabout MX
Current consumption	max. 60 mA (with read/write access)
Battery service life	max. 10 hours (with read/write access)

Mechanical Data	
Ambient temperature	-25 °C ... 50 °C
Storage temperature	-40 °C ... 85 °C
Protection class	IP20 in compliance with EN 60529
Connection	9-pin Sub-D connector
Weight	110 g
Dimensions	65 mm x 89 mm x 34 mm (L x W x H)

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8.5 Distance tables

8.5.1 Code carrier - Read/write attachment

Static read distances (mm) without offset at 25 °C

	Reading in air		Reading in steel	
ICC-8	0.0 ... 6.3		0.3. ...5.3	
ICC-10	0.0 ... 6.3		0.4 ...5.3	
ICC-12-T1	0.0 ... 6.5		0.5 ... 6.0	
ICC-16GK	0.0 ... 7.0		1.0 ... 5.5	
ICC-30	1.5 ... 17.0		3.5 ... 13.0	
ICC-30F	1.5 ... 17.0		3.5 ... 13.0	
ICC-30GK-T1	1.5 ... 16.0		3.5 ... 12.0	
ICC-30GK-T3	1.5 ... 16.0		3.5 ... 12.0	
ICC-50	0.5 ... 21.0		1.5 ... 12.5	

8.5.2 Data carrier - Read/write attachment

Read/write distances (mm) without offset at 25 °C

	Reading in air	Writing in air	Reading in steel	Writing in steel
IDC-08	0.5 ... 6.3	0.5 ... 4.3	0.5 ... 4.5	0.5 ... 2.8
IDC-10	0.5 ... 6.3	1.2 ... 4.3	1.1 ... 4.5	1.3 ... 2.8
IDC-12	0.0 ... 7.7	1.5 ... 5.3	0.0 ... 5.5	1.6 ... 5.5
IDC-15	0.0 ... 9.5	0.0 ... 8.5	1.5 ... 6.8	1.5 ... 6.5
IDC-24	0.8 ... 12.5	1.5 ... 11.0	1.6 ... 9.5	3.7 ... 7.0
IDC-30	0.8 ... 13.5	1.5 ... 12.0	1.6 ... 10.0	3.7 ... 8.0
IDC-50	0.5 ... 20.0	0.5 ... 15.0	1.5 ... 17.8	2.2 ... 11.0
IDC-50F	0.5 ... 20.0	0.5 ... 15.0	1.5 ... 17.8	2.2 ... 11.0

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9 ASCII table

hex	dec.	ASCII	hex	dec.	ASCII	hex	dec.	ASCII	hex	dec.	ASCII
00	0	ZERO	20	32	Space	40	64	@	60	96	‘
01	1	SOH	21	33	!	41	65	A	61	97	A
02	2	STX	22	34	“	42	66	B	62	98	B
03	3	ETX	23	35	#	43	67	C	63	99	C
04	4	EOT	24	36	$	44	68	D	64	100	D
05	5	ENQ	25	37	%	45	69	E	65	101	E
06	6	ACK	26	38	&	46	70	F	66	102	F
07	7	BEL	27	39	‘	47	71	G	67	103	G
08	8	BS	28	40	(	48	72	H	68	104	H
09	9	HT	29	41	)	49	73	I	69	105	I
0A	10	LF	2A	42	*	4A	74	J	6A	106	J
0B	11	VT	2B	43	+	4B	75	K	6B	107	K
0C	12	FF	2C	44	,	4C	76	L	6C	108	L
0D	13	CR	2D	45	-	4D	77	M	6D	109	M
0E	14	SO	2E	46	.	4E	78	N	6E	110	N
0F	15	SI	2F	47	/	4F	79	O	6F	111	O
10	16	DLE	30	48	0	50	80	P	70	112	P
11	17	DC1	31	49	1	51	81	Q	71	113	Q
12	18	DC2	32	50	2	52	82	R	72	114	R
13	19	DC3	33	51	3	53	83	S	73	115	S
14	20	DC4	34	52	4	54	84	T	74	116	T
15	21	NAK	35	53	5	55	85	U	75	117	U
16	22	SYN	36	54	6	56	86	V	76	118	V
17	23	ETB	37	55	7	57	87	W	77	119	W
18	24	CAN	38	56	8	58	88	X	78	120	X
19	25	EM	39	57	9	59	89	Y	79	121	Y
1A	26	SUB	3A	58	:	5A	90	Z	7A	122	Z
1B	27	ESC	3B	59	;	5B	91	[	7B	123	{
1C	28	FS	3C	60	<	5C	92	\	7C	124	|
1D	29	GS	3D	61	=	5D	93	]	7D	125	}
1E	30	RS	3E	62	>	5E	94	^	7E	126	~
1F	31	US	3F	63	?	5F	95	_	7F	127	DEL

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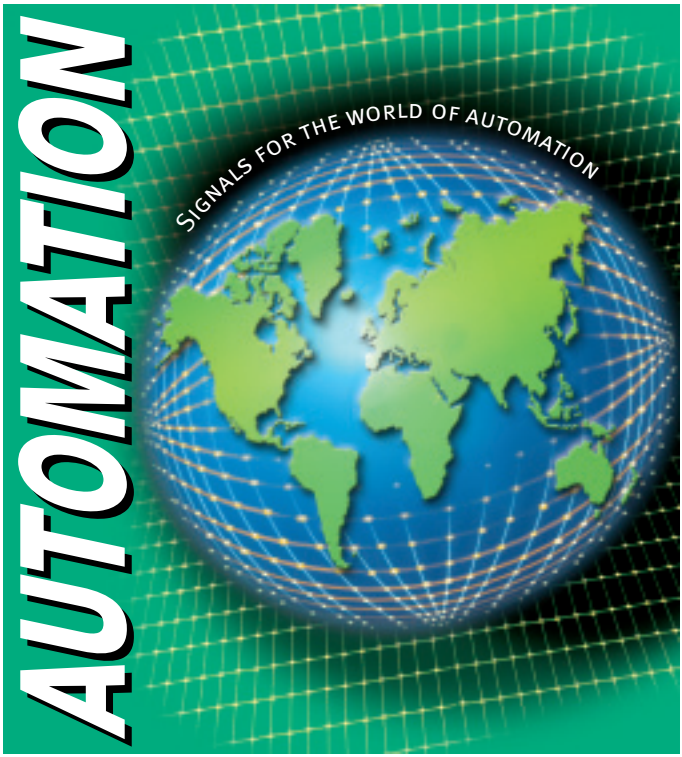

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