vs | verkehrs**systeme**

# vs | plus

Release Document Version 9.1

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# TABLE OF CONTENTS

# 1    VERSION

## 1.1    vs | plus core

The vs | plus core version 9.1 builds on the vs | plus version 9.0.

See also released documents:

vsplus Freigabedokument Version 900.pdf

## 1.2    Tools

### 1.2.1    Parameterization

To create the vs | plus parameterization, use the vs | worksuite version 3.4 or later. vs | plus 9.1 cannot be parameterized with older versions of the vs | worksuite.

Parameterizations in an older vs | plus version can be upgraded by copying the node version to version 9.1 with the vs | worksuite version 3.4.

### 1.2.2    Testing Parameterization with vs | test in the vs | worksuite 3.4

Testing a vs | plus 9.1 Parameterization in vs | test is possible. The visualization in vs | test, however, can only represent a maximum number of 64 traffic streams.

### 1.2.3    Testing Parameterization with vs | mate in PTV Vissim

A vs | plus 9.1 parameterization can be fully simulated and tested with vs | mate. Process data from vs | plus can also be displayed with the new maximum up to 96 traffic streams (s. 2.1).

### 1.2.4    Testing Parameterization with vs | emulator in PTV Vissim

A vs | plus 9.1 parameterization can also be simulated and tested with the vs | emulator version 4.0 or higher.

## 1.3　Overview of compatibility between the vs | plus versions

The vs | plus 9.1 core only supports loading VCB data of version 9.1. Attempting to supply other versions throws away an error message no. 13.

| vs \| plus version core | vs \| plus version VCB Import | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6.0.0 | 6.1.0 | 6.1.2 | 6.1.3 | 6.1.4 | 6.2.0 | 6.2.1 | 6.2.2 | 6.2.3 | 6.2.4 | 6.2.5 | 6.2.6 | 7.0.0 | 8.0.0 | 8.0.1 | 8.1.0 | 9.0.0 | 9.1.0 |
| 6.0.0 | X | | | | | | | | | | | | | | | | | |
| 6.1.0 | | X | | | | | | | | | | | | | | | | |
| 6.1.2 | | | X | | | | | | | | | | | | | | | |
| 6.1.3 | | X | X | X | | | | | | | | | | | | | | |
| 6.1.4 | | | | X | X | | | | | | | | | | | | | |
| 6.2.0 | | | | | | X | | | | | | | | | | | | |
| 6.2.1 | | | | | | X | X | | | | | | | | | | | |
| 6.2.2 | | | | | | X | X | X | | | | | | | | | | |
| 6.2.3 | | | | | | X | X | X | X | | | | | | | | | |
| 6.2.4 | | | | | | X | X | X | X | X | | | | | | | | |
| 6.2.5 | | | | | | X | X | X | X | X | X | | | | | | | |
| 6.2.6 | | | | | | X | X | X | X | X | X | X | | | | | | |
| 7.0.0 | | | | | | | | | | | X | X | X | | | | | |
| 8.0.0 | | | | | | | | | | | X | X | X | X | | | | |
| 8.0.1 | | | | | | | | | | | X | X | X | X | X | | | |
| 8.1.0 | | | | | | | | | | | | | | | | X | | |
| 9.0.0 | | | | | | | | | | | | | | | | X | X | |
| 9.1.0 | | | | | | | | | | | | | | | | | | X |

*Table 1: Compatibility between the vs | plus versions*

## 2     WHAT'S NEW IN VERSION 9.1

### 2.1     The maximum number of traffic streams has been increased from 64 to 96 (U 8780)

vs | plus now supports the processing of a maximum of 96 traffic streams. With the vs | worksuite from version 3.4 onwards, 96 instead of 64 traffic streams can now also be set up and parameterized.

The maximum number of traffic streams in the main and minor series, as well as the number of possible enemy traffic streams, remain the same.

| vs | plus version | Max. traffic streams | Max. traffic streams per main series | Max. traffic streams per minor series | Max. enemies per traffic stream |
|---|---|---|---|---|
| 6.1.3 to 9.0.0 | 64 | 64 | 24 | 50 |
| 9.1.0 | 96 | 64 | 24 | 50 |

*Table 2: Available max. traffic streams of the vs | plus versions*

| vs | plus version | Max. traffic streams | Of which max. individual transport | Of which max. public transport standard | Of which max. public transport memory |
|---|---|---|---|---|
| 6.2.0 to 9.0.0 | 64 | 64 | 45 | 32 |
| 9.1.0 | 96 | 64 | 64 | 32 |

*Table 3: Breakdown of available traffic streams into IT and PT*

### 2.2     Customization of control types with vs | plus (U 8533 and U 8535)

#### 2.2.1   Deprecated Control Types

The following control types are no longer available as of version 9.1:

- vs | plus stage control (VSP_PHASEN)
- Step control with or without rebound (ZSOR, ZSMR)
- Stage control with or without rebound (ZPOR, ZPMR)

These types of control were rarely ever used in the field. We see this functionality in vs | plus as no longer needed or desired and decided to remove the implementation from version 9.1 onwards.

#### 2.2.2   Clean-up process data output

The OITD numbers for the corresponding process data output (see 5.4) and the functions in open vs | plus have been adjusted accordingly.

#### 2.2.3   Adjusted vs | plus message output

Messages 60 to 64 of the vs | plus stage control are no longer output.

#### 2.2.4   Cleaning up the parameterization and supply

As of vs | worksuite version 3.4, it is no longer possible to parameterize e.g. a stage control. However, the editors or objects are "only" hidden. This means that cleaning up or deleting the control types that are no longer supported must take place before copying and upgrading to version 9.1.

If parameters for stage control are supplied or if one of the control types is entered in the program definitions, vs | plus outputs a supply error message 13, e.g. 13, 9, 13, 81, 64. As the last parameter, the new error detail number 64 indicates that the parameter group or object is not supported.

## 2.3    Customization of Network Control Types with vs | plus (U 8534)

### 2.3.1   Influencing vs | plus

The third-party network control types (e.g. Balance, EPICS, etc.), as well as our local vs | plus network control are no longer available. Influencing vs | plus can still be managed with OCIT-Free-Command files. These can be transmitted from a central to the controller and then to vs | plus.

With the corresponding order definition, vs | plus the transmission of this data:
- Traffic stream signal frame plan
- Freestyle parameters (Freie Net Parameter)

Please refer to the relevant instructions on how to influence vs | plus by means of OCIT-Free-Command files.

### 2.3.2   Activating network Control

The network control together with the processing of the command files configured and activated globally in the vs | worksuite settings for the control method of the node version and no longer needs to be activated for individual programs in addition.

If TaMod (traffic-actuated modifications) are configured for the node version at the same time, they will be disabled at runtime by vs | plus.



*Illustration 1: Turn on network control when creating or copying a node version*

For the command files to be received, the connection to a central must be confirmed by the controller interface (interface function «getProgramSource»).

### 2.3.3   Special Commands

In the command file, a response mode for network control can be specified. The response mode selects, which network control messages (s. 2.3.4) should be output:
- Response mode 1 and 2 -> warnings and info (all messages)
- Response mode 3 -> warnings only
- Response mode 4 and 5 -> no messages will be output

By default, all messages are output.

A network control On/Off command can be sent by a command file. This command gets acknowledged but has no effect on the operation of the network control. Unless you want to cancel an ongoing job by transferring the job number 0.

### 2.3.4   Network control messages from vs | plus

After adjusting the network control types, the following network control messages are still available.

### 2.3.4.1   Network control message 80

The network control message (80 ... job number... parameter 1 ... til... 5) has been revised:

| 80 | Information | Active Network Control Command |
|---|---|---|
| A network control command has been received and vs | plus tries to execute the job. | | |
| 1, 2 | 1, 0:  Job is no longer executed because it has reached its expiration date<br>1, 1:  Job is no longer executed because it is not allowed in the current signal program<br>1, 2:  Job has reached activation time and is now activated.<br>1, 4:  Job was cancelled by follow-up order number 0<br>(see also release document vs | plus 6.2.6) | |
| 3 | Receive time (hour) of the network control command | |
| 4 | Receive time (minute) of the network control command | |
| 5 | Receive time (second) of the network control command | |

*Table 4: Network control message 80*

### 2.3.4.2   Network control message 81

The network control message (81 ... job number... parameter 1 ... til... 5) has been revised:

| 81 | Information | New Network Control Command |
|---|---|---|
| A network control command has been received and vs | plus acknowledges the reception of a job. | | |
| 1, 2 | 1, 0:  Job received with traffic stream signal frame plan or freestyle parameters<br>2, 0:  Network control On/Off job received<br>3, 0:  Received job for message output response mode<br>1, 1:  The new job does not have a job number<br>1, 2:  The new job has already reached its expiration date<br>1, 3:  The new job is not intended for the current signal program<br>1, 4:  The new job has not yet reached its activation time | |
| 3 | Receive time (hour) of the network control command | |
| 4 | Receive time (minute) of the network control command | |
| 5 | Receive time (second) of the network control command | |

*Table 5: Network control message 81*

### 2.3.4.3  Power control message 86

The network control message (86 ... job number... parameter 1 ... til... 5) has been revised:

| 86 | Warning | Network Control Command Error |
|----|---------|-------------------------------|
| Error messages when reading a network control command (new command file received). | | |

| | | |
|---|---|---|
| 1 | 1: | Error opening command file |
| | 2: | Command file is not in VCB format |
| | 3: | File version is incorrect |
| | 4: | Incorrectly completed file |
| | 5: | Unexpected end of file |
| | 6: | Contains unsupported job data, signal groups |
| | 7: | Contains unsupported Coordination or Blocked-Period job data |
| | 8: | Contains unsupported job data Blocked-Period |
| | 9: | Traffic stream ID is out of range |
| | 10: | Freestyle parameters are out of range |
| | 20: | Network control type is not supported |
| | 21: | No vs \| plus control method |
| | 22: | vs \| plus version is invalid |
| | 23: | OCIT unit number is not valid (less than or equal to 0) |
| 2 | 0 | |
| 3 | 0 | |
| 4 | 0 | |
| 5 | 0 | |

*Table 6: Network control message 86*

### 2.3.5  Process Data Output

The output of the following two process data is still available. All other process data of the network control has been removed (see also 5.4):

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 57.600 | 3736152 | NetModG | USHORT | Network control general data | 1 | 20 | 7.0.0 | |
| 57.620 | 3736172 | NetRahmen | USHORT | Signal frame plan network control | 1 | 64 | 7.0.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |

*Table 7: Available process data for the revised network control system*

## 2.4   Extension of Signalcolors for vs| plus On-demand-control

The enumeration of the possible "Off" colors for the demand mode in the "VsplusShared.h" file has been expanded. The hex values correspond to the OCIT codes of the corresponding signal colors.

```c
/*On-Demand Control*/
typedef enum OcitColourCodes_e
{
    /*
    * ...HzDark -> flashing dark start
    * ... Hz -> flashing bright start
    * ... 1Hz, 2Hz -> flashing frequency
    */

    UndefindedOcitColourCode = -1,
    OcitCCDark = 0x00,
    OcitCCRed1HzDark = 0x01,
    OcitCCRed1Hz = 0x02,
    OcitCCAmber1HzDark = 0x04,
    OcitCCRedAndAmber1HzDark = 0x05,
    OcitCCAmber1Hz = 0x08,
    OcitCCRedAndAmber1Hz = 0x0A,
    OcitCCAmber = 0x0C,
    OcitCCRedAndAmber = 0x0F,
    OcitCCGreen1HzDark = 0x10,
    OcitCCAmberAndGreen1HzDark = 0x14,
    OcitCCGreen1Hz = 0x20,
    OcitCCAmberAndGreen1Hz = 0x28,
    /*green is permanently on with amber flashing at the same time*/
    OcitCCAmber1HzDarkAndStandingGreen = 0x34,
    OcitCCAmber1HzAndStandingGreen = 0x38,
    OcitCCAmberAndGreen = 0x3C,
    OcitCCRed2HzDark = 0x41,
    OcitCCRed2Hz = 0x42,
    OcitCCAmber2HzDark = 0x44,
    OcitCCRedAndAmber2HzDark = 0x45,
    OcitCCAmber2Hz = 0x48,
    OcitCCRedAndAmber2Hz = 0x4A,
    OcitCCGreen2HzDark = 0x50,
    OcitCCAmberAndGreen2HzDark = 0x54,
    OcitCCGreen2Hz = 0x60,
    OcitCCAmberAndGreen2Hz = 0x68,
    /*green is permanently on with amber flashing at the same time*/
    OcitCCAmber2HzDarkAndStandingGreen = 0x74,
    OcitCCAmber2HzAndStandingGreen = 0x78,

} OcitColourCodes;
```

## 2.5    Other new features in version 9.1

| U 8463 B 8902 | open vs | plus function library extended |
|---|---|
| | Miscellaneous functions of the open vs | plus library, provisionally available for internal use, were tentatively published in the open vs | plus editor, enabling to test their functionality and future use. |
| | BYTE l_DetektorAktiv (WORD DetID) |
| | WORD p_DetektorKanalNrIV (WORD DetID) |
| | WORD p_DetektorVerkehrsstromIV (WORD DetID) |
| | WORD l_VSWartezeitZug (BYTE VSID, BYTE Zug) |
| | BYTE p_VSAnzeUNBEDINGT (BYTE VSID, BYTE Index) |
| | BYTE p_VSAnzeUNDbedingte (BYTE VSID, BYTE Index) |
| | BYTE p_VSAnzeODERbedingte (BYTE VSID, BYTE Index) |
| | BYTE l_VSPrioKlasse (BYTE VSID) |
| | BYTE l_VSAnfoGueltig (BYTE VSID) |
| | WORD l_VSdtRahmensignal (BYTE VSID) |
| | WORD l_VSRestfahrzeit (BYTE VSID) |
| | BYTE l_VSOeVPrio (BYTE VSID) |
| | BYTE l_VSKontrollZeit (BYTE VSID) |
| | BYTE l_VSAnfoTyp (BYTE VSID) |
| | BYTE l_VSGruenWegen (BYTE VSID) |
| | BYTE l_VSHatStau (BYTE VSID) |
| | BYTE l_AnzVSzuSG (BYTE SGKanal) |
| | BYTE l_VSzuSG (BYTE SGKanal, BYTE Index) |
| | WORD l_BildWB (BYTE Index) |
| | WORD l_BildOeVRang (BYTE Index) |
| | BYTE l_AnzeAktiv (BYTE AnzeID) |

*Table 8: U 8463 / B 8902 newly published open vs | plus functions*

| U 8669 | Traffic light phase assistant revised |
|---|---|
| | The process data output (57,400 and 57,401) for the traffic light phase assistant has been removed (see 5.4). The traffic light phase assistant is only used internally in vs | plus. |

*Table 9: U 8669 Traffic light phase assistant revised*

## 3      IMPROVEMENTS IN VERSION 9.1.0

| B 8278 | Miscellaneous open vs \| plus functions reworked |
|---|---|
| | p_DetektorEichwert reads the detector parameter "calibration value" of the current dataset. The function can only be used for PT-standard detectors. |
| | p_DetektorVorbereitungszeit can only be selected for public transport detectors. |
| | p_DetektorEntprellzeit reads the detector parameter "debounce time" of the current dataset. The function can only be used for PT-standard detectors. |
| | The doubling of the I_IstVSAktiv function by I_IstVSinHRvorhanden has been fixed. The I_IstVSinHRvorhanden function can now be used under its own name. |
| | I_Port and I_Blinker now return whether the display element is effectively "On" using the controller interface functions isOnDigital and isOnBlinker, respectively. Previously, the two functions returned 1 by default. |
| | Calling the I_OCIT_O_ZNr, I_OCIT_O_FNr, and I_OCIT_O_Relknoten functions no longer generates error messages. |
| | The arguments for the vehicle statistics functions can now be selected and passed in the open vs \| plus editor. |
| | I_OeVZuglaenge has been re-implemented and made available again for open VS \| Plus. |

*Table 10: Solution B 8278*

| B 8324 | Output and documentation of vs \| plus message 18 extended |
|---|---|
| | The output of the old error number 150 is omitted because the vs \| plus error number 18 already clearly indicates an error in the public transport memory. The notification has been simplified; it is no longer two-part as before. The documentation of the message output has been extended. |
| | s. 5.2 |
| | s. *https://vs-plus.com/vsp_help_d/vs_plus/18vsplus90.html* and *https://vs-plus.com/vsp_help_d/vs_plus/18vsplus91.html* |

*Table 11: Solution B 8324*

| B 8511 | Corrected supply data check of signal frame plan extensions |
|---|---|
| | It is checked for the maximum program number (32) instead of the maximum number of signal frame plans (16). This means that the check is synchronous with the checking of the program definitions. Previously, the check would fail and trigger a supply error message if a signal frame plan was assigned to a program with a number higher than 16. |

*Table 12: Solution B 8511*

| | |
|---|---|
| B 8662<br>B 8700<br>B 8901 | **False triggers of vs \| plus message 12 prevented** |
| | The check whether the cycle time of the currently supplied signal frame plan corresponds to that of the signal program (on the controller side) now takes place with each program change (including the initial program start). Previously, this check was only performed when switching between vs \| plus programs. At the same time, the triggering of message 12 was coordinated with the signal frame plan extensions and the program definitions in such a way that no more false triggering should occur. The message is displayed as an information but should be considered when testing the parameterization.<br><br>For vs \| plus version 9.0 we have defined a workaround that prevents the unwanted triggering of message 12. |
| | s. 5.1 |

*Table 13: Solution B 8662 / B 8700 / B 8901*

| | |
|---|---|
| B 8833 | **open vs \| plus function I_DetektorWartezeit repaired** |
| | In vs \| plus versions 8.1 and 9.0, the function no longer considered the first train (train number 0). In the current version 9.1 this error has been corrected and the train number 0 is considered again. The documentation has been adapted accordingly. |
| | For public transport standard, the following train numbers 1 and 2 are additionally considered. |
| | For public transport memory, the range of subsequent train numbers has been extended from 1 to 3 to 1 to 5. |
| | s. *https://vs-plus.com/vsp_help_d/vs_plus/Wartezeit.html* |

*Table 14: Solution B 8833*

| | |
|---|---|
| B 2019/10/10 | **Switching on of sound signals available again in case of interlocked traffic streams** |
| | The adjustments for the sound signals of the visually impaired (vs \| plus 8.0.1) have been reimplemented for version 9.1. |

*Table 15: Solution B 2019/10/10*

| | |
|---|---|
| B 2023/11/09 | **Output of vs \| plus message 13 extended** |
| | Like the checking of display elements, a single message 13 with error code 4 is now output for each detector with an unavailable device channel number. Previously, the detector channel test aborted after the first error found. |
| | This has the advantage that all invalid channels are output at the first supply attempt and thus can be corrected in one. |
| | Error message 13 with error code 4 is also output if a callpoint of type "parallel" is detected in the public transport memory parameters and its assigned channel number is higher than the allowed "parallel" channel number (255). |
| | Callpoint numbers that are in the same range as the channel numbers of the regular detectors will be excluded from the test as before. |

*Table 16: Solution B 2023/11/09*

| 13 | Fatal Error | Fault VCB supply |
|---|---|---|
| The VCB file is corrupted. The test of the VCB parameters was not passed. | | |
| Parameter No.: | Value: | |

| 1 | Error code: | Meaning: |
|---|---|---|
| | 1 | Error code 1 is not used |
| | 2 | The node number does not match |
| | 3 | Signal groups are addressed that do not exist in the controller |
| | 4 | Parallel detectors are addressed, which are not available in the controller |
| | 5 | The file could not be opened |
| | 6 | It's not a VCB file |
| | 7 | File version does not match the vs \| plus version |
| | 8 | Error in the parameter file |
| | 9 | Errors in the data structure |
| | 10 | Error in the parameter dataset |
| | 11 | Invalid parameter values |
| | 99 | Global Data Structure Does Not Exist |

| 2 | Value of parameter no. 1 is: | Value of parameter no. 2 means: |
|---|---|---|
| | 2 or 7 | Expected value |
| | 3 or 4 | Channel number (unavailable or invalid) |
| | 6 | 0:     VCB file<br>1:     Multi-VCB file |
| | 9 | Group number |
| | 11 | Read value |

| 3 | Value of parameter no. 1 is: | Value of parameter no. 3 means: |
|---|---|---|
| | 2 or 7 | Read value |
| | 6 | 1:     Excess vs \| plus supply<br>2:     Excess open vs \| plus supply<br>3:     Multi-VCB not detected |
| | 9 | Object number |
| | 11 | Hi-word of the parameter ID |

| 4 | Value of parameter no. 1 is: | Value of parameter no. 4 means: |
|---|---|---|
| | 7 | 0:     False vs \| plus version<br>1:     False open vs \| plus version |
| | 9 | Error detail (*) |
| | 10 | Program number |
| | 11 | Lo-word of the parameter ID |

*Table 17: Extension Error Message 13*

s. https://vs-plus.com/vsp_help_d/vs_plus/13.html

| B 8909 | Setting the current maximum green time at the end of demand mode |
|---|---|
| | At the end of the switch-on sequence leaving on-demand mode, the traffic stream states are set according to the states and times of their assigned UN-conditional-related display elements. Now, in addition, the current maximum green is set with the maximum green time value (tgmax2) from the parameterization, if the traffic stream is in green. |

*Table 18: Solution B 8909*

| B 8903 | Adjusting the transmission of signal group switching requests to the vs | emulator, or vs | test interface respectively |
|---|---|
| | The customization only affects the vs | emulator v4.0 and vs | test of the vs | worksuite v3.4. It does **not** concern a real controller unit. |
| | The internal interface now not only checks whether the switching mode for a signal group has changed, but also whether the switching request, switching command or the flag for direct operation have changed and sets the new values accordingly. |
| | Prior to this fix, testing in vs | test or in the vs | emulator could cause a test or simulation to get stuck in the off/on sequences of the vs | plus on-demand control. |
| | The fix applies retroactively from vs | plus version 9.0 (the first version with on-demand control). |

*Table 19: Solution B 8903*

| B 2024/07/01 | Max waiting time of a traffic stream interferes with the vs | plus on-demand control |
|---|---|
| | Setting a maximum waiting time of 0 or 1 second had the effect that the assigned traffic stream didn't remain inactive during the demand mode but was processed further by vs | plus. |
| | Consequently, the subsequent switch-on sequence was not switched as expected, or unexpected traffic stream states were subsequently displayed. |
| | The problem was corrected. The maximum waiting time of a traffic stream is ignored during on-demand operation. |

*Table 20: Solution of on-demand sequences influenced by max. waiting time VS*

| B 9317 | The principle of acyclic processing of the main series can be used again |
|---|---|
| | The acyclic control (principle of processing main row) is deactivated in versions 8.1.0, 9.0.0 to 9.1.0 [1][1] (Patch 3). From version 9.1.0 [1][2] (Patch 4), the acyclic principle can be used again. |

*Table 21: Solution B 9317*

| B 9320 | Adopt traffic stream states when switching off partial nodes |
|---|---|
| | The traffic stream states are not reset in versions 9.1.0 [0][0] to 9.1.0 [1][1] (Patch 3) when a partial node is switched off. After switching back on, the assigned display elements cannot be switched anymore, depending on the state (e.g. green granted). The phase stalls and the waiting times continue increasing until the cycle control starts eventually. The problem has been fixed as of version 9.1.0 [1][2] (patch 4). |

*Table 22: Solution B 9320*

## 4    VS | PLUS CORE

During the further development of vs | plus we are constantly working on improving the quality of the source code for the core. Our intention is to improve the maintainability of the vs | plus core and simplify the implementation of extensions. For version 9.1 too, restructuring and clean-ups have been made to the source code.

For details and instructions on how to integrate the vs | plus core in a controller system, please refer to these documents:

vs | plus Implementation Manual EN v03-00-05.pdf

| U 7322 | Fixed compiler warnings |
|---|---|
| | Considers Windows (MSVC) C and CPP x64 debug, x64 release, x86 debug, and x-86 release configurations |
| | Considers Linux (GCC) C and CPP x64 debug and x64 release configurations |
| | We have turned off certain warnings using pragma directives. Since we work with MSVC as well as with GCC compilers, pragmas are used for both compilers. The directives are not compatible between compilers and again trigger warnings (unknown pragmas). These are to be deactivated globally as required:<br><br>-    GCC: -Wno-unknown-pragmas<br><br>-    MSVC: -wd4068 |
| | s. 5.3 |

*Table 23: Fixed compiler warnings*

| U 8538 | Memory requirements of the vs | plus on-demand control reduced |
|---|---|
| | The vs | plus on-demand control objects are no longer created in static memory. Instead, a vs | plus internal memory manager is used during the supply routine to allocate, if necessary, controller working memory for on-demand control objects. |
| | The data structures are created with their maximum number. But only if on-demand control is parameterized and supplied. This is intended to significantly reduce the load on the memory of the controller. |

*Table 24: Reduced storage requirements for on-demand control*

## 5    APPENDIX

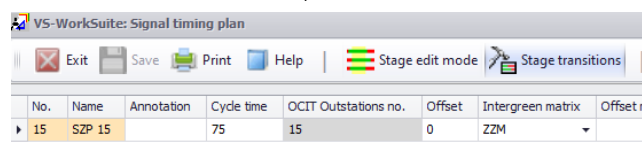### 5.1    Workaround to avoid false triggering of vs | plus message 12

vs | plus sends a message 12 after a program change, if it is determined that the cycle time of the signal plan does not match the cycle time of the signal frame plan supplied for that program. Due to an adjustment of the supply in version 8.1, the reading of the cycle times of the signal frame plans has been changed. As a result, message 12 erroneously appeared as a false alarm.

Note: If all programs are parameterized with FTA, a message 12 will never be displayed. The problem does not exist in this case.

Note: The supply and subsequent processing of the signal frame plan cycle times are correct. Message 12 is therefore a false alarm in most cases.

In version 9.1, the issue has been fixed. In the affected versions 8.1 and 9.0, however, this correction can no longer be applied. The workaround described below does not apply to version 8.1 As of version 9.1, it is no longer necessary. Nevertheless, we recommend that you consistently parameterize the numbering of the signal plans, signal frame plans, controller place location and program numbers and that the conditions of the workaround be adhered to for all parameterizations:
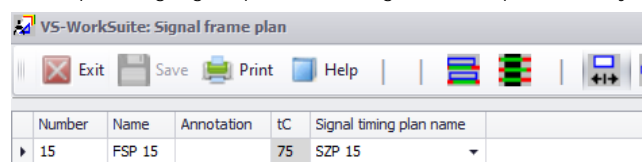
For version 9.0, 15 is the maximum possible program number (numbers up to 32 are allowed in versions 8.0.1 and down and version 9.1 upwards).
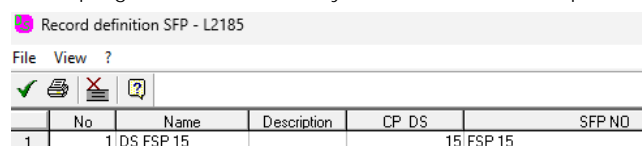


The signal frame plan number must be the same as the signal plan number. It is best to assign the corresponding signal plan to the signal frame plan. The cycle time is then automatically applied.



The controller place number (CP-DS) of the signal frame plan record in the SFP record definition must be equal to the program number. Ideally, it should also correspond to the signal frame plan number.
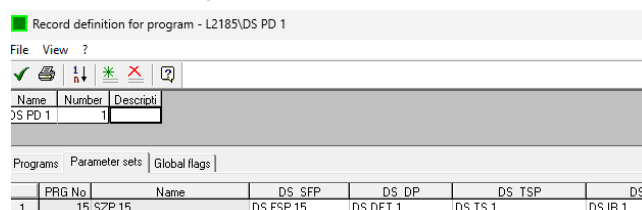


Summarized:

-    Signal plan number = signal frame plan number = controller place number = program number,
-    Signal plan cycle time = Signal frame plan cycle time
-    Valid program numbers are 1 to 15 (versions 9.0, 8.1), or 1 to 32 (version < 8.1 or >= 9.1)

## 5.2    Revised vs | plus message 18

Before vs | plus 9.1

Corrected version of the existing documentation:

| 18 | Warning | Output of PT Memory Error Function |
|---|---|---|
| The message is output in two parts, e.g.:<br>Error No.: 18 (p1:1, p2:150, p3:8, p4:1)<br>Error No.: 18 (p1:2, p2:11, p3:14, p4:0) | | |
| First part of the message | | |
| 1 | 1 | |
| 2 | 150 (old error number) | |
| 3 | 8: Error in PT traffic stream data | |
| | 9: Error PT callpoint data | |
| 4 | If PT traffic stream data (8) fails, 1 is displayed | |
| | If PT callpoint data (9) is incorrect, the parameter set number is displayed | |
| Second part of the message | | |
| 1 | 2 | |
| 2 | Type* | |
| 3 | Error type is 1:0 | |
| | Error type is greater than 1: Index of the PT call sequence (group index) | |
| 4 | 0 | |

From vs | plus 9.1:

The message has been compressed to the output on one line:

| 18 | Warning | Output of PT Memory Error Function |
|----|---------|-------------------------------------|
| Faulty public transport parameter (call sequence with callpoints or traffic stream) | | |
| 1 | 8: Error in PT traffic stream data | |
| | 9: Error PT callpoint data | |
| 2 | Message parameter 1 is 8:1 | |
| | Message parameter 1 is 9: parameter set number | |
| 3 | Type* | |
| 4 | Message parameter 3 is 1:0 | |
| | Message parameter 3 is > 1: Index of the PT call sequence (group index) | |

* Error types of PT traffic stream data

| 1 | Null reference to PT traffic stream data |
|----|------------------------------------------|
| 3 | Traffic steam or signal group not in range 1 to VSMAX, or exceeds ANZEMAX (possibly with message 17) |
| 4 | Force call detector (function) exceeds DETMAX |
| 5 | |
| 6 | |
| 7 | Error in the definition of the force call definition (possibly NULL) |
| 9 | Callpoint with call type "parallel" or "gap" exceeds DETMAX |
| 11 | Errors in lines and routes |

* Error types of PT callpoint data

| 1 | Zero reference to PT callpoint data |
|----|-------------------------------------|
| 8 | More than 4 callpoints for travel-time selection |
| 10 | The function of the last callpoint is not INAK or ABOV |

* Error type 2 is not used.

## 5.3    Cleaned compiler warnings

The following warnings have been fixed:
- Fpermissive
- C90 Comments
- Wsign-compare
- Wswitch
- Wwrite-strings
- Wformat-security
- Wparantheses
- Waddress
- Wimplicit-fallthrough
- Wunused-parameter
- Wunused-but-set-variable
- Wformat-overflow
- Wunused-variable
- Function can be set static
- Wunused-function
- Wignored-qualifiers
- Wtype-limits
- C4244 conversion
- C4459 global declaration
- C4701 potentially uninitialized
- C4702 unreachable code
- C4706 assignment inside logical operators
- C4245, C4108 signed-unsigned mismatch
- would-style-declaration
- Wunused-const-variable
- Wdeclaration-after-statement
- C4206 empty translation unit
- C6289 invalid operator
- C6385 overflow possible
- C6287 redundant code


For the following warnings, sections were ignored with pragma directives:
- C4244, C4702, C4324, C4334, C6297
- Wunused-but-set-variable
- Wunused-parameter
- Wignored-qualifiers
- Wimplicit-fallthrough


Unresolved alerts:
- Wimplicit-function-declaration (in MathFunctions.c under GCC C90 (ANSI-C) the functions fmax() and fmin() are not known)

## 5.4    Currently available vs | plus process data (OITD numbers)

| Identifier | OITD4 Number | Day | Type | Description | Min / Max | | From / to vs \| plus version | |
|---|---|---|---|---|---|---|---|---|
| 57.0 | 3735552 | VSP_VERSION | USHORT | Version of the control method | 1 | 1 | 6.2.0 | |
| 57.1 | 3735553 | VSP_TX_TU | USHORT | System Variable VS-PLUS (TX, TU) | 1 | 2 | 6.2.0 | |
| 57.2 | 3735554 | VSP_RSPist_RSPsoll | USHORT | System Variable VS-PLUS (Frame Signal Plan Actual, Target) | 1 | 2 | 6.2.0 | |
| 57.3 | 3735555 | VSP_PRGist_PRGsoll | USHORT | System Variable VS-PLUS (Program Actual, Target) | 1 | 2 | 6.2.0 | |
| 57.4 | 3735556 | VSP_SYSTEM4 | USHORT | System Variable VS-PLUS | 1 | 1 | 6.2.0 | |
| 57.5 | 3735557 | VSP_SYSTEM5 | USHORT | System Variable VS-PLUS | 1 | 1 | 6.2.0 | |
| 57.6 | 3735558 | VSP_SYSTEM6 | USHORT | System Variable VS-PLUS | 1 | 1 | 6.2.0 | |
| 57.7 | 3735559 | VSP_SYSTEM7 | USHORT | System Variable VS-PLUS | 1 | 1 | 6.2.0 | |
| 57.8 | 3735560 | VSP_SYSTEM8 | USHORT | System Variable VS-PLUS | 1 | 1 | 6.2.0 | |
| 57.9 | 3735561 | VSP_SYSTEM9 | USHORT | System Variable VS-PLUS | 1 | 1 | 6.2.0 | |
| 57.10 | 3735562 | VSP_ADAPTIV_EVS | BYTE | System Variable Adaptive Control EVS | 1 | 1 | 6.2.0 | 8.0.0 |
| 57.11 | 3735563 | VSP_ADAPTIV_Zustand_EVS | BYTE | System Variable Adaptive Control (running EVS) | 1 | 1 | 6.2.0 | 8.0.0 |
| 57.12 | 3735564 | VSP_ADAPTIV3 | USHORT | System Variable Adaptive Control (EVS State) | 1 | 1 | 6.2.0 | 8.0.0 |
| 57.13 | 3735565 | VSP_ADAPTIV4 | USHORT | System Variable Adaptive Control | 1 | 1 | 6.2.0 | 9.0.0 |
| 57.14 | 3735566 | VSP_ADAPTIV5 | USHORT | System Variable Adaptive Control | 1 | 1 | 6.2.0 | 9.0.0 |
| 57.15 | 3735567 | VSP_ADAPTIV6 | USHORT | System Variable Adaptive Control | 1 | 1 | 6.2.0 | 9.0.0 |
| 57.16 | 3735568 | VSP_ADAPTIV7 | USHORT | System Variable Adaptive Control | 1 | 1 | 6.2.0 | 9.0.0 |
| 57.17 | 3735569 | VSP_ADAPTIV8 | USHORT | System Variable Adaptive Control | 1 | 1 | 6.2.0 | 9.0.0 |
| 57.18 | 3735570 | VSP_ADAPTIV9 | USHORT | System Variable Adaptive Control | 1 | 1 | 6.2.0 | 9.0.0 |
| 57.19 | 3735571 | VSP_ADAPTIV10 | USHORT | System Variable Adaptive Control | 1 | 1 | 6.2.0 | 9.0.0 |
| 57.101 | 3735653 | DET_WARTEZEIT | USHORT | Waiting time of a detector | 1 | 280 | 6.2.0 | 6.2.2 |
|  |  |  |  |  | 1 | 500 | 6.2.3 | |
| 57.102 | 3735654 | VS_ZUSTAND | BYTE | Current state of the traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
|  |  |  |  |  | 1 | 96 | 9.1.0 | |

| 57.103 | 3735655 | VS_WARTEZEIT | USHORT | Waiting time of the traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.104 | 3735656 | VS_STUFE | BYTE | Current priority level of traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.105 | 3735657 | VS_KONTROLLZEIT | BYTE | Control time of the traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.106 | 3735658 | VS_G_MAX | USHORT | Maximum green time to be achieved | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.107 | 3735659 | VS_PRIOKLASSE | BYTE | Current priority class of traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.108 | 3735660 | VS_PF_WERT | USHORT | Priority value of traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.109 | 3735661 | VS_ANFO_GUELTIG | BYTE | Is a traffic stream request valid? | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.110 | 3735662 | VS_ANFO_TYP | BYTE | Request type of the traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.111 | 3735663 | VS_WUNSCH | BYTE | In which zone is the traffic stream? | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.112 | 3735664 | VS_RAHMENSIGNAL | BYTE | The current frame signal of the traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.113 | 3735665 | VS_STATUS | BYTE | The status of the traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.114 | 3735666 | VS_DT_RAHMEN | USHORT | Current time difference to the next frame signal | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.115 | 3735667 | VS_RESTFAHRZEIT | SHORT | Remaining travel time for a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.116 | 3735668 | VS_OEV_PRIO | BYTE | Priority of a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |

| 57.117 | 3735669 | VS_GRUEN_WEGEN | BYTE | The traffic stream has been given green because of | 1 | 64 | 6.2.0 | 9.0.0 |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1 | 96 | 9.1.0 | |
| 57.118 | 3735670 | VS_HAT_STAU | BYTE | The traffic stream is congested | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.119 | 3735671 | VS_ZZ_KURZ | BYTE | The traffic stream works with a shortened intergreen time | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.120 | 3735672 | VS_VERRIEGELUNG | BYTE | The traffic stream is interlocked | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.121 | 3735673 | VS_OEV_RANG | BYTE | Ranking of public transport traffic streams | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.122 | 3735674 | VS_ANKUNFT_EW | USHORT | Expected second of arrival of a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.123 | 3735675 | VS_ROT_GRUN | USHORT | Current red/green time of a traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.124 | 3735676 | VS_WSUMM | BYTE | The repetition sum of a traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.125 | 3735677 | MAIN HANDS | BYTE | The main pointer of a priority element | 1 | 6 | 6.2.0 | 8.0.1 |
| | | | | | 1 | 24 | 8.1.0 | |
| 57.126 | 3735678 | IDEAL | BYTE | The desired image of a priority element | 1 | 10 | 6.2.0 | |
| 57.127 | 3735679 | TK_AKTIVFLAG | BYTE | Active flag of a partial node | 1 | 3 | 6.2.0 | |
| 57.128 | 3735680 | OEV_WARTEZEIT_VS | USHORT | Waiting time of a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.130 | 3735682 | OEV_LINIE_VS | USHORT | Line identification of a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.131 | 3735683 | OEV_ROUTE_VS | USHORT | Route identification of a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.132 | 3735684 | OEV_KURS_VS | USHORT | Course identifier of a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |

| 57.133 | 3735685 | OEV_FOLGEZUEGE_VS | BYTE | Follow-up train identification of a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1 | 96 | 9.1.0 | |
| 57.134 | 3735686 | OEV_ABMELDEZEIT_VS | USHORT | Check-out time of a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.135 | 3735687 | OEV_NOTAN_WARTEZEIT_VS | USHORT | Waiting time for a forced call of a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.136 | 3735688 | OEV_PRIORITAET_VS | BYTE | Priority of a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.137 | 3735689 | OEV_ZWANGSABM_VS | BYTE | Forced check-out time of a public transport traffic stream | 1 | 64 | 6.2.0 | 9.0.0 |
| | | | | | 1 | 96 | 9.1.0 | |
| 57.138 | 3735690 | DET_S_IMP_SUMME | USHORT | Rising slopes sum | 1 | 120 | 6.2.0 | 6.2.2 |
| | | | | | 1 | 255 | 6.2.3 | |
| 57.139 | 3735691 | DET_F_IMP_SUMME | USHORT | Falling slopes sum | 1 | 120 | 6.2.0 | 6.2.2 |
| . | | | | | 1 | 255 | 6.2.3 | |
| 57.140 | 3735692 | DET_BELGRAD | BYTE | Current occupancy rate | 1 | 120 | 6.2.0 | 6.2.2 |
| | | | | | 1 | 255 | 6.2.3 | |
| 57.141 | 3735693 | DET_BELGRAD_GEGLAETTET | BYTE | Smoothed occupancy rate | 1 | 120 | 6.2.0 | 6.2.2 |
| . | | | | | 1 | 255 | 6.2.3 | |
| 57.142 | 3735694 | DET_AKT_BELZEIT | USHORT | Current occupancy time | 1 | 120 | 6.2.0 | 6.2.2 |
| | | | | | 1 | 255 | 6.2.3 | |
| 57.143 | 3735695 | DET_AKT_BELZUST | USHORT | Current occupancy status | 1 | 120 | 6.2.0 | 6.2.2 |
| . | | | | | 1 | 255 | 6.2.3 | |
| 57.144 | 3735696 | DET_LUECKE | USHORT | Time since the last falling slope | 1 | 120 | 6.2.0 | 6.2.2 |
| | | | | | 1 | 255 | 6.2.3 | |
| 57.145 | 3735697 | DET_BRUTTO_LUECKE | USHORT | Time since the last rising slope | 1 | 120 | 6.2.0 | 6.2.2 |
| . | | | | | 1 | 255 | 6.2.3 | |
| 57.146 | 3735698 | DET_STOERUNG | BYTE | Current fault status | 1 | 120 | 6.2.0 | 6.2.2 |
| | | | | | 1 | 255 | 6.2.3 | |

| 57.147 | 3735699 | HAUPTZEIGER_RANG | UBYTE | Rank of a priority element by main series pointer | 1 | 6 | 6.2.0 | 8.0.1 |
|--------|---------|------------------|-------|--------------------------------------------------|---|---|-------|-------|
|        |         |                  |       |                                                  | 1 | 24 | 8.1.0 | |
| 57.148 | 3735700 | FP_FZ_STD | USHORT | Vehicles per hour completed intervals | 1 | 64 | 8.0.0 | 9.0.0 |
|        |         |           |        |                                       | 1 | 96 | 9.1.0 | |
| 57.149 | 3735701 | FP_DAUER_FZ_STD | USHORT | Duration of vehicles per hour completed intervals | 1 | 64 | 8.0.0 | 9.0.0 |
|        |         |                 |        |                                                   | 1 | 96 | 9.1.0 | |
| 57.150 | 3735702 | FP_FZ_STD_AKT | USHORT | Vehicles per hour including current interval | 1 | 64 | 8.0.0 | 9.0.0 |
|        |         |               |        |                                              | 1 | 96 | 9.1.0 | |
| 57.151 | 3735703 | FP_DAUER_FZ_STD_AKT | USHORT | Duration of vehicles per hour including current interval | 1 | 64 | 8.0.0 | 9.0.0 |
|        |         |                     |        |                                                          | 1 | 96 | 9.1.0 | |
| 57.152 | 3735704 | FP_GRUEN_FZ_STD | USHORT | Greens per hour | 1 | 64 | 8.0.0 | 9.0.0 |
|        |         |                 |        |                 | 1 | 96 | 9.1.0 | |
| 57.153 | 3735705 | FP_DAUER_GRUEN_STD | USHORT | Duration of Green per hour | 1 | 64 | 8.0.0 | 9.0.0 |
|        |         |                    |        |                            | 1 | 96 | 9.1.0 | |
| 57.154 | 3735706 | FP_GRUEN_FZ_STD_AKT | USHORT | Greens per hour including current interval | 1 | 64 | 8.0.0 | 9.0.0 |
|        |         |                     |        |                                            | 1 | 96 | 9.1.0 | |
| 57.155 | 3735707 | FP_DAUER_GRUEN_FZ_STD_AKT | USHORT | Duration of Green per hour including current interval | 1 | 64 | 8.0.0 | 9.0.0 |
|        |         |                           |        |                                                       | 1 | 96 | 9.1.0 | |
| 57.390 | 3735942 | EPICS_ERROR_DATA1 | USHORT | Error messages from EPICS | 0 | 5 | 7.0.0 | 9.0.0 |
| 57.400 | 3735952 | APHA_SG_DATA | BYTE | Dynamic data for the traffic light phase assistant | 1 | 150 | 7.0.0 | 9.0.0 |
| 57.401 | 3735953 | APHA_SG_DATA_complex | Complex | 57,400 as a structure | 0 | 29 | | |
| 57.600 | 3736152 | NetModG | USHORT | Network control general data | 1 | 20 | 7.0.0 | |
| 57.601 | 3736153 | BvorA1 | USHORT | Balance Presets A 1 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.602 | 3736154 | BvorAUS1 | USHORT | Balance Presets OFF 1 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.603 | 3736155 | BvorA2 | USHORT | Balance Presets A 2 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.604 | 3736156 | BvorAUS2 | USHORT | Balance Specifications AUS 2 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.605 | 3736157 | BvorFRUEH1 | USHORT | Balance Default Earliest A 1 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.606 | 3736158 | BvorSPAET1 | USHORT | Balance Default: Latest A 1 | 1 | 96 | 7.0.0 | 9.0.0 |

| 57.607 | 3736159 | BvorFRUEH2 | USHORT | Balance Default Earliest A 2 | 1 | 96 | 7.0.0 | 9.0.0 |
|--------|---------|------------|--------|------------------------------|---|----|-------|-------|
| 57.608 | 3736160 | BvorSPAET2 | USHORT | Balance Default: Latest A 2 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.611 | 3736163 | EvorA1 | USHORT | EPICS Specifications A 1 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.612 | 3736164 | EvorAUS1 | USHORT | EPICS Specifications AUS 1 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.613 | 3736165 | EvorA2 | USHORT | EPICS Specifications A 2 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.614 | 3736166 | EvorAUS2 | USHORT | EPICS Specifications AUS 2 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.615 | 3736167 | EvorFRUEH1 | USHORT | EPICS Default Earliest A 1 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.616 | 3736168 | EvorSPAET1 | USHORT | EPICS Default Latest A 1 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.617 | 3736169 | EvorFRUEH2 | USHORT | EPICS Default Earliest A 2 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.618 | 3736170 | EvorSPAET2 | USHORT | EPICS Specification Latest A 2 | 1 | 96 | 7.0.0 | 9.0.0 |
| 57.620 | 3736172 | NetFrame | USHORT | Signal frame plan network control | 1 | 64 | 7.0.0 | 9.0.0 |
|        |         |            |        |                                   | 1 | 96 | 9.1.0 |       |
| 57.650 | 3736202 | EPICSGeneral | USHORT | EPICS General Data | 0 | 9 | 7.0.0 | 9.0.0 |
| 57.651 | 3736203 | EPICSQueues | USHORT | EPICS Queues | 0 | 9 | 7.0.0 | 9.0.0 |
| 57.652 | 3736204 | EPICStBs | USHORT | EPICS tBS | 0 | 9 | 7.0.0 | 9.0.0 |
| 57.653 | 3736205 | EPICSPrabbit sequence | USHORT | EPICS Stage Sequence | 0 | 9 | 7.0.0 | 9.0.0 |
| 57.654 | 3736206 | EPICSSSignalplan | USHORT | EPICS Signal Plan | 0 | 9 | 7.0.0 | 9.0.0 |
| 57.655 | 3736207 | EPICSMeldung | USHORT | EPICS Announcement | 0 | 9 | 7.0.0 | 9.0.0 |
| 57'800 | 3736352 | PH_STATUS | BYTE | Returns the status of the stage | 1 | 32 | 8.1.0 | 9.0.0 |
| 57'801 | 3736353 | PH_MAX_WARTEZEIT | USHORT | Returns the longest wait time of all traffic streams in the stage | 1 | 32 | 8.1.0 | 9.0.0 |
| 57'802 | 3736354 | PH_MIN_GRUENZEIT | USHORT | Returns the shortest green time of all traffic streams of the stage | 1 | 32 | 8.1.0 | 9.0.0 |
| 57'803 | 3736355 | PH_MAX_ROTZEIT | USHORT | Returns the longest red time of all traffic streams of the stage | 1 | 32 | 8.1.0 | 9.0.0 |
| 57'804 | 3736356 | PH_AKTIV | BYTE | Returns the number of the currently active stage | 1 | 1 | 8.1.0 | 9.0.0 |
| 57'805 | 3736357 | PH_VORHERIGE | BYTE | Returns the number of the previous active stage | 1 | 1 | 8.1.0 | 9.0.0 |
| 57'806 | 3736358 | PH_NAECHSTE | BYTE | Returns the number of the next active stage | 1 | 1 | 8.1.0 | 9.0.0 |
| 57'807 | 3736359 | PH_HAT_RAHMEN | BYTE | Specifies whether the stage has a frame signal or not | 1 | 32 | 8.1.0 | 9.0.0 |
| 57'808 | 3736360 | PH_PHASENUEBERGANG_AKTIV | BYTE | Specifies whether a stage transition is active or not | 1 | 1 | 8.1.0 | 9.0.0 |
| 57'809 | 3736361 | PH_ALLES_ROT | BYTE | Specifies whether stage ALL_RED is active or not | 1 | 1 | 8.1.0 | 9.0.0 |

| 57'850 | 3736402 | VM_AKTIV | BYTE | Specifies whether a modification is active and, if so, which one | 1 | 1 | 8.1.0 | |
|---|---|---|---|---|---|---|---|---|
| 57'851 | 3736403 | VM_PRIORITAET | BYTE | Returns the priority of the specified modification | 1 | 40 | 8.1.0 | |
| 57'852 | 3736404 | VM_HAT_UNVERTRAEGLICHKEIT | BYTE | Specifies whether the specified modification has an intolerance or not | 1 | 40 | 8.1.0 | |
| 57'853 | 3736405 | VM_AUSLOESE_ERFUELLT | BYTE | Specifies whether the trigger event is met for a given modification | 1 | 40 | 8.1.0 | |
| 57'854 | 3736406 | VM_EINGRIFF_MOEGLICH | BYTE | Specifies whether an intervention can currently be made for the specified modification | 1 | 40 | 8.1.0 | |
| 57'855 | 3736407 | VM_RESTDAUER | BYTE | Specifies the remaining duration of the currently active modification | 1 | 1 | 8.1.0 | |
| 57'890 | 3736442 | OEVA_ANZAHL_VS | BYTE | Returns the current number of traffic streams in the public transport sequence | 1 | 10 | 8.1.0 | |
| 57'891 | 3736443 | OEVA_VS_AUF_POSITION | BYTE | Traffic stream located at the specified position of the public transport sequence | 1 | 105 | 8.1.0 | |
| 57'900 | 3736452 | RZ_AKTUELLER_ZAEHLER | BYTE | Returns the current counter to the specified signal group | 1 | 96 | 9.0.0 | |
| 57'901 | 3736453 | RZ_MAX_ZAEHLER | BYTE | Returns the maximum counter to the specified signal group | 1 | 96 | 9.0.0 | |
| 57'902 | 3736454 | RZ_AKTUELLE_RESTZEIT | BYTE | Returns the current estimated remaining time, in seconds, to the specified signal group | 1 | 96 | 9.0.0 | |
| 57'903 | 3736455 | RZ_ERWARTETE_RESTZEIT | BYTE | Returns the next expected remaining time, in seconds, to the specified signal group | 1 | 96 | 9.0.0 | |
| 57'904 | 3736456 | RZ_AKTUELLE_MAX_RESTZEIT | BYTE | Returns the current expected maximum remaining time, in seconds, to the specified signal group | 1 | 96 | 9.0.0 | |
| 57'905 | 3736457 | RZ_ERWARTETE_MAX_RESTZEIT | BYTE | Returns the next expected maximum remaining time, in seconds, to the specified signal group | 1 | 96 | 9.0.0 | |
| 57'906 | 3736458 | RZ_PROG_MAX_RESTZEIT | BYTE | Returns the current predicted maximum remaining time, in seconds, to the specified signal group | 1 | 96 | 9.0.0 | |
| 57'907 | 3736459 | RZ_AKTUELLE_MIN_RESTZEIT | BYTE | Returns the current expected minimum remaining time, in seconds, to the specified signal group | 1 | 96 | 9.0.0 | |
| 57'908 | 3736460 | RZ_ERWARTETE_MIN_RESTZEIT | BYTE | Returns the next expected minimum remaining time, in seconds, to the specified signal group | 1 | 96 | 9.0.0 | |
| 57'909 | 3736461 | RZ_PROG_MIN_RESTZEIT | BYTE | Returns the current predicted minimum remaining time, in seconds, to the specified signal group | 1 | 96 | 9.0.0 | |
| 57'910 | 3736462 | RZ_ZUSTAND_SIGNALGRUPPE | BYTE | Specifies the current state of the specified signal group | 1 | 96 | 9.0.0 | |
| 57'911 | 3736463 | RZ_ZUSTAND | BYTE | Specifies whether the remaining time calculation of a signal group is currently ignored | 1 | 96 | 9.0.0 | |
| 57'930 | 3736482 | BA_AKTIV | BYTE | Specifies whether a partial node is in demand mode or not | 1 | 3 | 9.0.0 | |
| 57'931 | 3736483 | BA_AUSLOESER | BYTE | In on-demand mode, during a power-on sequence, returns the triggering traffic stream for a sub-node | 1 | 3 | 9.0.0 | |

| 57'932 | 3736484 | BA_AUSSCHALTEN_AKTIV | BYTE | Specifies whether a power off sequence is running for a partial node in on-demand mode | 1 | 3 | 9.0.0 | |
| 57'933 | 3736485 | BA_GESPERRT | BYTE | Specifies whether a demand control partial node is locked or not | 1 | 3 | 9.0.0 | |
| 57'934 | 3736486 | BA_STOERUNG | BYTE | Specifies whether a demand control partial node has a malfunction or not | 1 | 3 | 9.0.0 | |

*Table 25: OITD Numbers List of Available vs | plus process data*

Imprint
Filename            vsplus Release Version 910 EN.docx
Storage date        11.12.2024 16:55
Last Modified       Cyrill Jucker
Quality assurance   SQS-certified quality system according to ISO 9001 (Reg.Nr. 34856)
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