

Summary of Modifications

Instructions for the Editor

1. Clause 5.2.7.3
 - Add definitions for ARB(F1) and ARB(F7)
2. Clause 25
 - Add new clause defining Congestion Signals

*Changes are shown highlighted in yellow.

5.2.7.3 8B/10B Primitive Signals

A Primitive Signal is an Ordered Set designated by this standard to have special meaning. All FC_Ports shall at a minimum recognize R_RDY and Idle Primitive Signals. All Primitive Signals not recognized by the FC_Port shall be treated as Fill Words. When a single Ordered Set is detected possible Primitive Signals detected are listed in table 8.

To assure a sufficient number of Fill Words between frames, the originator of any Primitive Signal (except ARByx, ARB(val), MRK, SYNx, SYNy, and SYNz) shall precede and follow the Primitive Signal by a minimum of two Fill Words. Because Fill Words may be removed by intermediate transmitters, the number of Fill Words preceding or following a Primitive Signal at a receiver may be reduced to zero.

All Primitive Signals in 8b/10B have negative beginning running disparity.

Table 8 - 8B/10B Primitive Signals

Abbr.	Primitive Signal	Reference	Ordered Set
Idle	Idle	5.2.7.4	K28.5 – D21.4 – D21.5 – D21.5
R_RDY	Receiver_Ready	20.4	K28.5 – D21.4 – D10.2 – D10.2
VC_RDY	Virtual Circuit Ready	FC-SW-7	K28.5 – D21.7 – VC_ID – VC_ID
BB_SCs	buffer-to-buffer State Change (SOF)	20.4.9	K28.5 - D21.4 – D22.4 – D22.4
BB_SCr	buffer-to-buffer State Change (R_RDY)	20.4.9	K28.5 - D21.4 – D22.6 – D22.6
SYNx	Clock Synchronization Word X	24.4	K28.5 – D31.3 – CS_X1 – CS_X2
SYNy	Clock Synchronization Word Y	24.4	K28.5 – D31.5 – CS_Y1 – CS_Y2
SYNz	Clock Synchronization Word Z	24.4	K28.5 – D31.6 – CS_Z1 – CS_Z2
ARBff	Arbitrate	FC-AL-2 and 11.3.5	K28.5 - D20.4 - D31.7 - D31.7
ARByx	Arbitrate	FC-AL-2	K28.5 – D20.4 – y – x
ARB(val)	Arbitrate	FC-AL-2	K28.5 – D20.4 – val – val
ARB(F1)	Congestion Warning Signal	25	K28.5 – D20.4 – D17.7 – D17.7
ARB(F7)	Congestion Alarm Signal	25	K28.5 – D20.4 – D23.7 – D23.7
CLS	Close	FC-AL-2	K28.5 – D5.4 – D21.5 – D21.5
DHD	Dynamic Half-Duplex	FC-AL-2	K28.5 – D10.4 – D21.5 – D21.5
MRKtx	Mark	FC-AL-2	K28.5 – D31.2 – MK_TP – AL_PS
OPNyx	Open full-duplex	FC-AL-2	K28.5 – D17.4 – AL_PD – AL_PS
OPNyy	Open half-duplex	FC-AL-2	K28.5 – D17.4 – AL_PD – AL_PD
OPNyr	Open selective replicate	FC-AL-2	K28.5 – D17.4 – AL_PD – D31.7
OPNfr	Open broadcast replicate	FC-AL-2	K28.5 – D17.4 – D31.7 – D31.7
Idle2	Alternate Idle 2	FC-BaseT	K28.5 – D7.0 – D9.1 – D9.1

Idle3	Alternate Idle 3	FC-BaseT	K28.5 – D7.0 – D9.5 – D9.5
-------	------------------	----------	----------------------------

25 Congestion Signal

The Congestion Signal provides a method of indicating the presence of congestion conditions between FC_Ports. A Congestion Signal is sent by an FC_Port to an attached FC_Port to indicate the attached FC_Port behavior has caused the sending FC_Port to consume resources above defined thresholds.

25.1 Overview

Congestion Signals are primitive signals transmitted to indicate the following:

1. Building congestion is indicated by the Warning Congestion Signal (see 25.3.1); and,
2. Critical congestion is indicated by the Alarm Congestion Signal (see 25.3.2).

The ability of the FC_Port to transmit and/or receive Congestion Signals is determined by the Exchange Diagnostic Capabilities ELS exchange including the Congestion Detection Capability descriptor (see FC-LS-5).

An FC_Port capable of transmitting only one type of Congestion Signal value shall transmit the Warning Congestion Signal.

The conditions necessary to activate transmission of a Congestion Signal are determined by the FC_Port and are outside the scope of this specification.

25.2 Definition

Congestion Signals are defined as primitive signals and are defined in Table 8.

25.2.1 Transmission and Processing

Congestion Signals are defined as an "Other Special Function" (see 5.3.7) and are preceded and succeeded by a minimum of two fill words. Congestion Signals cannot be added or deleted for alignment marker insertion and rate compensation and processing occurs after the PCS/FEC processing.

25.3 Protocol

25.3.1 Warning Congestion Signal

The detecting FC_Port transmits a Warning Congestion Signal if the transmission resources are consumed above a first level threshold producing congesting behavior. The transmission of the Warning Congestion Signal persists for the duration of the congesting behavior (i.e., while the detecting FC_Port transmission resources are consumed above the Warning threshold) and discontinues if the congesting behavior subsides (i.e., the detecting FC_Port transmission resource consumption is below the Warning threshold).

The transmission rate of the Warning Congestion Signal is determined during the EDC exchange between the two ports of the link (see FC-LS-5).

25.3.2 Alarm Congestion Signal

The detecting FC_Port transmits the Alarm Congestion Signal if the transmission resources are consumed above a second level threshold producing critical behavior. The transmission of the Alarm Congestion Signal persists for the duration of the critical behavior (i.e., while the detecting FC_Port transmission resources are consumed above the Alarm threshold) and discontinues if the critical behavior subsides (i.e., the detecting FC_Port transmission resource

consumption is below the Alarm threshold). If the resource consumption falls below the Alarm threshold, the Warning signal is transmitted until the resource consumption falls below the Warning threshold.

The transmission rate of the Alarm Congestion Signal is determined during the EDC exchange between the two ports of the link (see FC-LS-5).

Only one type of Congestion Signal is transmitted at a time (i.e., if a congesting behavior is detected, the detecting FC_Port transmits either the Warning or Alarm Congestion Signal, but not both).