

ISO 11783-2:2019 (E)

Tractors and machinery for agriculture and forestry — Serial control and communications data network — Part 2: Physical layer

Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms and definitions
4	Abbreviated terms
5	General requirements
5.1	Network physical layer
5.2	Physical media
5.3	Differential voltage
5.4	Bus
5.4.1	Levels
5.4.1.1	General
5.4.1.2	During arbitration
5.4.2	Voltage range
5.4.3	Bus termination
5.4.3.1	Twisted quad bus segment
5.4.3.2	Twisted pair physical layer bus segment
5.5	Resistance and capacitance
5.5.1	Internal resistance (R_{in}), capacitance (C_{in})
5.5.2	Differential internal resistance (R_{diff}), capacitance (C_{diff})
5.5.3	Weak termination for stubs
5.6	Bit time
5.7	AC parameters
6	Bus segment specifications
6.1	Twisted quad bus segment
6.2	TPPL bus segment
7	Electrical specifications
7.1	Electrical data
7.1.1	General
7.1.2	Absolute maximum ratings
7.1.3	DC parameters
7.1.3.1	Power supply operating ranges
7.1.3.2	Power supply minimum current
7.1.3.3	Requirements for DC voltage supplied by tractor through the IBBC
7.1.3.4	Requirements for DC voltage drop on implements
7.1.3.5	Bus-disconnected ECU
7.1.3.6	Bus-connected ECU
7.1.4	Bus voltages (operational)
7.1.5	Electrostatic discharge (ESD)
7.2	Physical media parameters
7.2.1	Unshielded twisted quad cable
7.2.2	Unshielded twisted pair
7.3	Topology of twisted quad physical layers
7.3.1	ECU connection to TBC_PWR and TBC_RTN

7.3.2	Power for TBC_PWR and TBC_RTN
7.4	Topology of twisted pair physical layer
7.4.1	General
7.4.2	Simple stub
7.4.3	Compound stub
7.4.4	Multiple splice
7.5	TBC parameters
7.6	Connectors
7.6.1	General
7.6.1.1	Electrical performance
7.6.1.2	Mechanical characteristics
7.6.2	Bus extension connector
7.6.2.1	General
7.6.2.2	Dimensions
7.6.2.3	Pin allocations
7.6.3	Implement bus breakaway connector
7.6.3.1	General
7.6.3.2	Terminating bias circuit for TQPL IBBC
7.6.3.3	Terminating circuit for twisted pair physical layer IBBC
7.6.3.4	Dimensions
7.6.3.5	Pin allocations
7.6.3.6	Ground isolation
7.6.3.7	Backward compatibility
7.6.4	In-cab connector
7.6.4.1	General
7.6.4.2	In-cab connector receptacle dimensions
7.6.4.3	In-cab connector pin allocations
7.6.4.4	In-cab connector plug dimensions
7.6.4.5	In-cab connector cable connections for TQPL
7.6.4.6	In-cab connector cable connections for TPPL
7.6.5	Diagnostic connector
7.6.5.1	General
7.6.5.2	Receptacle dimensions
7.6.5.3	Locking plug dimensions
7.6.5.4	Non-locking plug dimensions
7.6.5.5	Pin allocations
7.6.5.6	Diagnostic connector dimensions
8	Conformance tests
8.1	General requirements
8.2	Internal resistance
8.3	Internal differential resistance
8.4	ECU recessive input threshold
8.5	ECU dominant input threshold
8.6	ECU dominant output
8.7	ECU internal delay time
9	Bus failure and fault confinement
9.1	General
9.2	Loss of network connection
9.3	Node power or ground loss
9.4	Reaction to power-supply voltage disturbances
9.5	Network disruption during connection, disconnection or power-up
9.6	Open and short failures
Annex A	(informative) Protocol controller timing and naming
A.1	Bit subdivision
A.2	Internal delay time
A.3	Synchronization
A.4	Synchronization jump width (SJW)
A.5	CAN bit timing requirements
Annex B	(informative) Examples of physical layer circuits
B.1	General

B.2	Network interconnection
B.3	Terminating bias circuit
B.4	Automatic TBC at bus breakaway connector
B.5	Optional TBC unit
B.6	Circuits for power control
Annex C	(informative) Optional ECU stub connector
C.1	General

Page count: 65