

SIEMENS

Product data sheet

6ES7154-8FX00-0AB0

SIMATIC DP,
IM 154-8FX PN/DP CPU FOR ET200PRO,
1,5MB WORKING MEMORY, INT. PROFINET IF,
INT.PROFIBUS DP MASTER/SLAVE IF PROT.
IP65/67,
MMC REQUIRED

General information	
Hardware product version	01
Firmware version	V3.2
Engineering with	
Programming package	As of STEP7 V5.5 with HSP 222 + Distributed Safety V5.4 SP4
Supply voltage	
Rated voltage/DC	24 V
24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
External protection for supply cables (recommendation)	MCB 24V DC / 16A with tripping characteristic
External protection for supply cables (recommendation)	MCB 24V DC / 16A with tripping characteristic Type B and C (see ET 200pro manual)
Load voltage L+	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption (rated value)	350 mA ; Typical
Current consumption (in no-load operation), typ.	250 mA ; Typical, current consumption for CPU in STOP state
Rated value at 24 V DC	350 mA ; Typical

Inrush current, max.	2 A ; Typical
Inrush current, typ.	2 A ; Typical
Starting current inrush I^2t	0.25 A ² ·s ; Typical
I^2t	0.25 A ² ·s ; Typical
Power losses	
Power loss, typ.	8.5 W ; Typical
Memory	
Work memory	
integrated	1536 kbyte
expandable	No
Load memory	
pluggable (MMC)	Yes
pluggable (MMC), max.	8 Mbyte
Data management on MMC (after last programming), min.	10 a
Backup	
present	Yes ; Guaranteed by MMC (maintenance-free)
without battery	Yes ; Program and data
CPU processing times	
for bit operations, min.	0.025 µs
for word operations, min.	0.03 µs
for fixed point arithmetic, min.	0.04 µs
for floating point arithmetic, min.	0.16 µs
CPU-blocks	
Number of blocks (total)	1024 ; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
Number, max.	1024 ; Number range: 1 to 16000
Size, max.	64 kbyte
FB	
Number, max.	1024 ; Number range: 0 to 7999
Size, max.	64 kbyte
FC	
Number, max.	1024 ; Number range: 0 to 7999

Size, max.	64 kbyte
OB	
Size, max.	64 kbyte
Number of free cycle OBs	1 ; OB 1
Number of time alarm OBs	1 ; OB 10
Number of delay alarm OBs	2 ; OB 20, 21
Number of time interrupt OBs	4 ; OB 32, 33, 34, 35
Number of process alarm OBs	1 ; OB 40
Number of DPV1 alarm OBs	3 ; OB 55, 56, 57
Number isochronous mode OBs	1 ; OB 61
Number of startup OBs	1 ; OB 100
Number of asynchronous error OBs	6 ; OB 80, 82, 83, 85, 86, 87 (OB83 only for centralized I/O and PROFINET IO)
Number of synchronous error OBs	2 ; OB 121, 122
Nesting depth	
per priority class	16
additional within an error OB	4
Counters, timers and their retentivity	
S7 counter	
Number	256
Retentivity	
adjustable	Yes
lower limit	0
upper limit	255
preset	Z 0 to Z 7
Counting range	
adjustable	Yes
lower limit	0
upper limit	999
IEC counter	
present	Yes
Type	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	

Number	256
Retentivity	
adjustable	Yes
lower limit	0
upper limit	255
preset	No retentivity
Time range	
lower limit	10 ms
upper limit	9990 s
IEC timer	
present	Yes
Type	SFB
Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
retentive data area, total	All, 128 KB max.
Flag	
Number, max.	2048 byte
Retentivity available	Yes ; MB 0 to MB 2047
Retentivity preset	MB 0 to MB 15
Number of clock memories	8
Data blocks	
Number, max.	1024 ; Number range: 1 to 16000
Size, max.	64 kbyte
Retentivity adjustable	Yes ; via non-retain property on DB
Retentivity preset	Yes
Local data	
per priority class, max.	32768 byte ; Max. 2048 bytes per block
Address area	
I/O address area	
Inputs	2048 byte
Outputs	2048 byte
of which, distributed	
Inputs	2048 byte

Outputs	2048 byte
Process image	
Inputs, adjustable	2048 byte
Outputs, adjustable	2048 byte
Inputs, default	128 byte
Outputs, default	128 byte
Subprocess images	
Number of subprocess images, max.	1 ; With PROFINET IO, the length of the user data is limited to 1600 bytes
Digital channels	
Inputs	16384
Outputs	16384
Inputs, of which central	128
Outputs, of which central	64
Analog channels	
Inputs	1024
Outputs	1024
Inputs, of which central	64
Outputs, of which central	64
Hardware configuration	
Racks, max.	1
Modules per rack, max.	16 ; Expansion width max. 1 m
Number of DP masters	
integrated	1
Time of day	
Clock	
Hardware clock (real-time clock)	Yes
battery-backed and synchronizable	Yes
Deviation per day, max.	10 s ; Typ.: 2 s
Backup time	6 wk ; At 40 °C ambient temperature
Operating hours counter	
Number	1
Number/Number range	0
Range of values	0 to 2 ³¹ hours (when using SFC 101)

Granularity	1 h
retentive	Yes ; Must be restarted at each restart
Clock synchronization	
supported	Yes
to MPI, master	Yes
to MPI, slave	Yes
to DP, master	Yes ; With DP slave only slave clock
to DP, slave	Yes
on Ethernet via NTP	Yes ; as client
Interfaces	
Supports protocol for PROFINET IO	
Number of PROFINET interfaces	1
WLAN	
Number of wireless interfaces	0
1st interface	
Type of interface	Integrated RS 485 interface
Physics	RS 485/connection: 2 x M12 b-coded
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	May only be used for external terminating resistor
Functionality	
MPI	Yes
DP master	Yes
DP slave	Yes
Point-to-point connection	No
MPI	
Services	
PG/OP communication	Yes
Routing	Yes
Global data communication	Yes
S7 basic communication	Yes
S7 communication	Yes
S7 communication, as client	No
S7 communication, as server	Yes

Transmission rate, max.	12 Mbit/s
DP master	
Services	
PG/OP communication	Yes
Routing	Yes
Global data communication	No
S7 basic communication	Yes ; I blocks only
S7 communication	Yes
S7 communication, as client	No
S7 communication, as server	Yes ; Connection configured on one side only
Equidistance mode support	Yes
Isochronous mode	Yes ; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
SYNC/FREEZE	Yes
Activation/deactivation of DP slaves	Yes
Direct data exchange (slave-to-slave communication)	Yes ; As subscriber
DPV1	Yes
Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	124
Address area	
Inputs, max.	2048 byte
Outputs, max.	2048 byte
User data per DP slave	
Inputs, max.	244 byte
Outputs, max.	244 byte
DP slave	
Services	
Routing	Yes ; with interface active
Global data communication	No
S7 basic communication	No
S7 communication	Yes
S7 communication, as client	No
S7 communication, as server	Yes ; Connection configured on one side only

Direct data exchange (slave-to-slave communication)	Yes
DPV1	No
Transmission rate, max.	12 Mbit/s
Automatic baud rate search	Yes ; only with passive interface
Transfer memory	
Inputs	244 byte
Outputs	244 byte
Address area, max.	32
User data per address area, max.	32 byte
2nd interface	
Type of interface	PROFINET
Physics	Ethernet (2 x M12 d-coded; 1 x RJ45)
Isolated	Yes ; Galvanic isolation for P3 is implemented in IM154 -8, for P1 and P2 in CM
Integrated switch	Yes
Number of ports	3
Automatic detection of transmission speed	Yes ; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Media redundancy	
supported	Yes
Switchover time on line break, typically	200 ms ; PROFINET MRP
Number of stations in the ring, max.	50
Change of IP address at runtime, supported	Yes
Functionality	
MPI	No
DP master	No
DP slave	No
PROFINET IO Controller	Yes ; Also simultaneously with IO-Device functionality
PROFINET IO Device	Yes ; Also simultaneously with IO Controller functionality
PROFINET CBA	Yes
Open IE communication	Yes ; Via TCP/IP, ISO on TCP, and UDP

Web server	Yes
PROFINET IO Controller	
Services	
PG/OP communication	Yes
Routing	Yes
S7 communication	Yes ; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
Isochronous mode	Yes ; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
Open IE communication	Yes ; Via TCP/IP, ISO on TCP, and UDP
Transmission rate, max.	100 Mbit/s
Number of connectable IO devices, max.	128
Max. number of connectable IO devices for RT	128
of which in line, max.	128
Number of IO devices with IRT and the option "high flexibility"	128
of which in line, max.	61
Number of IO Devices with IRT and the option "high performance", max.	64
of which in line, max.	64
IRT, supported	Yes
Prioritized startup supported	Yes
Number of IO Devices, max.	32
Activation/deactivation of IO Devices	Yes
Maximum number of IO devices that can be activated/deactivated at the same time.	8
IO Devices changing during operation (partner ports), supported	Yes
Max. number of IO devices per tool	8
Device replacement without swap medium	Yes
Send cycles	250 µs, 500 µs, 1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option)
Updating time	250 µs to 512 ms (depending on the operating mode, see "IM 154-8 CPU Interface Module" operating instructions for more details)
Address area	

Inputs, max.	2048 byte
Outputs, max.	2048 byte
User data per address area, max.	
User data consistency, max.	1024 byte
PROFINET IO Device	
Services	
PG/OP communication	Yes
Routing	Yes
S7 routing	Yes
S7 communication	Yes ; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
Isochronous mode	No
Open IE communication	Yes ; Via TCP/IP, ISO on TCP, and UDP
IRT, supported	Yes
PROFInergy, supported	Yes ; With SFB 73 / 74 prepared for loadable PROFInergy standard FB for I-Device
Shared device, supported	Yes
Number of IO controllers with shared device, max.	2
Transfer memory	
Inputs, max.	1440 byte ; Per IO Controller with shared device
Outputs, max.	1440 byte ; Per IO Controller with shared device
Submodules	
Number, max.	64
User data per submodule, max.	1024 byte
PROFINET CBA	
acyclic transmission	Yes
Cyclic transmission	Yes
Open IE communication	
Open IE communication, supported	Yes
Number of connections, max.	8
Local port numbers used at the system end	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
Keep-alive function, supported	Yes

Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes ; Via PROFIBUS DP or PROFINET interface
Communication functions	
PG/OP communication	Yes
Global data communication	
supported	Yes
Number of GD loops, max.	8
Number of GD packets, max.	8
Number of GD packets, transmitter, max.	8
Number of GD packets, receiver, max.	8
Size of GD packets, max.	22 byte
Size of GD packet (of which consistent), max.	22 byte
S7 basic communication	
supported	Yes
User data per job, max.	76 byte
User data per job (of which consistent), max.	76 byte ; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)
S7 communication	
supported	Yes
as server	Yes
as client	Yes ; (via integrated PROFINET interface and loadable FBs)
User data per job, max.	See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)
Open IE communication	
TCP/IP	Yes ; via integrated PROFINET interface and loadable FBs
Number of connections, max.	8
Data length, max.	32768 byte ; 1460 bytes with connection type 01H; 32768 bytes with connection type 11H
Several passive connections per port, supported	Yes
ISO-on-TCP (RFC1006)	Yes
Number of connections, max.	8
Data length, max.	32768 byte

UDP	Yes
Number of connections, max.	8
Data length, max.	1472 byte
Web server	
supported	Yes
Number of HTTP clients	5
User-defined websites	Yes
PROFINET CBA (at set setpoint communication load)	
Setpoint for the CPU communication load	50 %
Number of remote interconnection partners	32
Number of functions, master/slave	30
Total of all Master/Slave connections	1000
Data length of all incoming connections master/slave, max.	4000 byte
Data length of all outgoing connections master/slave, max.	4000 byte
Number of device-internal and PROFIBUS interconnections	500
Data length of device-internal und PROFIBUS interconnections, max.	4000 byte
Data length per connection, max.	1400 byte
Remote interconnections with acyclic transmission	
Sampling frequency: Sampling time, min.	500 ms
Number of incoming interconnections	100
Number of outgoing interconnections	100
Data length of all incoming interconnections, max.	2000 byte
Data length of all outgoing interconnections, max.	2000 byte
Data length per connection, max.	1400 byte
Remote interconnections with cyclic transmission	
Transmission frequency: Transmission interval, min.	1 ms
Number of incoming interconnections	200
Number of outgoing interconnections	200

Data length of all incoming interconnections, max.	2000 byte
Data length of all outgoing interconnections, max.	2000 byte
Data length per connection, max.	450 byte
HMI variables via PROFINET (acyclic)	
Number of stations that can log on for HMI variables (PN OPC/iMap)	3 ; 2x PN OPC/1x iMap
HMI variable updating	500 ms
Number of HMI variables	200
Data length of all HMI variables, max.	2000 byte
PROFIBUS proxy functionality	
supported	Yes
Number of linked PROFIBUS devices	16
Data length per connection, max.	240 byte ; Slave-dependent
Number of connections	
overall	16
usable for PG communication	15
reserved for PG communication	1
Adjustable for PG communication, min.	1
Adjustable for PG communication, max.	15
usable for OP communication	15
reserved for OP communication	1
adjustable for OP communication, min.	1
adjustable for OP communication, max.	15
usable for S7 basic communication	14
Reserved for S7 basic communication	0
adjustable for S7 basic communication, min.	0
adjustable for S7 basic communication, max.	14
usable for routing	X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: 24 max.
S7 message functions	
Number of login stations for message functions, max.	16 ; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes

simultaneously active Alarm-S blocks, max.	300
Test commissioning functions	
Status/control	
Status/control variable	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters
Number of variables, max.	30
of which status variables, max.	30
of which control variables, max.	14
Forcing	
Forcing	Yes
Force, variables	I/O
Number of variables, max.	10
Status block	Yes ; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
Diagnostic buffer	
present	Yes
Number of entries, max.	500 ; Only the last 100 entries are retentive at power on/off
adjustable	No
preset	10
Galvanic isolation	
between backplane bus and electronics	No
between backplane bus and all other circuit components	Yes
between supply and all other circuits	Yes
Permissible potential difference	
between different circuits	75 VDC / 60 VAC
Isolation	
Isolation checked with	In general 500 V DC, Ethernet interface 1500 V AC (for P1 and P2 on CM, for P3 on IM)
Degree and class of protection	
Type of protection	IP65/67
Standards, approvals, certificates	

CE mark	Yes
CSA approval	No
cULus	Yes
C-TICK	Yes
FM approval	No
Configuration	
Configuration software	
STEP 7	Yes ; V5.5 or higher
programming	
Programming language	
LAD	Yes
FBD	Yes
STL	Yes
SCL	Yes
CFC	Yes
GRAPH	Yes
HiGraph®	Yes
Command set	see instruction list
Nesting levels	8
Software libraries	
System functions (SFC)	see instruction list
System function blocks (SFB)	see instruction list
Know-how protection	
User program protection/password protection	Yes
Block encryption	Yes ; With S7 block Privacy
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm ; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
Weight	
Weight, approx.	720 g
Status	Jul 17, 2012