



BULLETIN 1203-GD2, -GK2 & 1336-GM2 DF1 / PCCC DATA FILE ADDRESSING

APPLICATION NOTE

OCTOBER 20, 1997

PURPOSE

The purpose of this document is to provide information on data file addressing using the DF1 protocol and Programmable Controller Communications Commands (PCCC) with the 1203-GD2, -GK2 or 1336-GM2. This document provides information only. Users must ensure that installations using DF1 and PCCC meet applicable codes and are suitable for the existing conditions.

WHAT THIS NOTE CONTAINS

This document contains information on PCCC data file addressing.

INTENDED AUDIENCE

This application note should be used by personnel familiar with the hardware components and programming procedures necessary to operate SCANport devices. It is also assumed that the user has some familiarity with serial communications and the programming required to implement serial protocols.

WHERE IT IS USED

The information contained in this application note is intended to address issues in many different applications. Some changes by the user may be necessary to apply the concepts of this document to a specific application.

APPLICATION CONSIDERATIONS

SCANport devices may assign different meanings to bits in the Logic Command and Status words. The usage of the Reference and Feedback words may also vary. Consult the manual for your SCANport device for more information.

FOR MORE INFORMATION

- | | |
|-----------------------|--|
| DF1 & PCCC | Data Highway/Data Highway Plus/DH-485 Communication Protocol and Command Set Reference Manual
Publication 1770-6.5.16 |
| 1203-Gx2 | Bulletin 1203 Serial Communications Module
RS232/422/485 (Using DF1 Protocol)
DH485
User Manual
Publication 1203-5.5 |



DEFINITIONS

- 1203-Gx2** A 1203-GD2 (120/230vac), 1203-GK2 (24vdc) or 1336-GM2 (internal mount) Serial Communications Module.
- DF1** A serial communications protocol defined in ANSI X3.28 subparagraphs D1 and F1.
- PCCC** Programmable Controller Communications Commands -- the commands transmitted over DF1 that are used to control Allen-Bradley PLC's, SLC's and other devices. Sometimes referred to as "PC-Cubed".

PCCC MESSAGES

The PCCC commands shown in the table below are a sampling of those supported by the 1203-Gx2. The remaining commands are generally not needed. For more information about PCCC messages, refer to Publication 1770-6.5.16. For more information about the 1203-Gx2 refer to Publication 1203-5.5.

CMD Code	FNC Code	Command Name	PLC Addressing Style
01h	n/a	Unprotected Read	PLC-2
08h	n/a	Unprotected Write	PLC-2
0Fh	00*	Word Range Write	PLC-2 System, Logical Binary, Logical ASCII (Not Symbolic)
	01*	Word Range Read	PLC-2 System, Logical Binary, Logical ASCII (Not Symbolic)
	67h	Typed Write	PLC-2 System, Logical Binary, Logical ASCII (Not Symbolic)
	68h	Typed Read	PLC-2 System, Logical Binary, Logical ASCII (Not Symbolic)

* FRN2.02 and later firmware only

* FRN2.02 and later firmware only



PLC-2 ADDRESSING

- Unprotected Read (CMD = 01h)
- Unprotected Write (CMD = 08h)

PLC-2 addresses in these two commands are at the beginning of the data section (immediately after the two TNS bytes) and are two bytes long. As with all multi-byte data the least significant byte is transmitted first.

PLC-2 addresses are entered into IPDS programming software as octal word addresses. The PLC-2 addresses shown in the 1203-Gx2 manual also use this format.

When a PLC-2 address is actually transmitted the value used is twice this value.

Tables 1 through 3 show several examples of this.

Parameter Number	Conversion Formula	Octal Address	Conversion Formula	Value as seen with a serial analyzer
1 _{dec}	512 _{dec} + 1 _{dec} =	1001 _{oct}	2 * 1001 _{oct} =	2002 _{oct} (0402 _{hex})
2 _{dec}	512 _{dec} + 2 _{dec} =	1002 _{oct}	2 * 1002 _{oct} =	2004 _{oct} (0404 _{hex})
3 _{dec}	512 _{dec} + 3 _{dec} =	1003 _{oct}	2 * 1003 _{oct} =	2006 _{oct} (0406 _{hex})
4 _{dec}	512 _{dec} + 4 _{dec} =	1004 _{oct}	2 * 1004 _{oct} =	2008 _{oct} (0408 _{hex})

Table 1 -- Parameter Read or Write Value Addresses

Parameter Number	Conversion Formula	Octal Address	Conversion Formula	Value as seen with a serial analyzer
1 _{dec}	7680 _{dec} + 1 _{dec} =	17001 _{oct}	2 * 17001 _{oct} =	36002 _{oct} (3C02 _{hex})
2 _{dec}	7680 _{dec} + 2 _{dec} =	17002 _{oct}	2 * 17002 _{oct} =	36004 _{oct} (3C04 _{hex})
3 _{dec}	7680 _{dec} + 3 _{dec} =	17003 _{oct}	2 * 17003 _{oct} =	36006 _{oct} (3C06 _{hex})
4 _{dec}	7680 _{dec} + 4 _{dec} =	17004 _{oct}	2 * 17004 _{oct} =	36008 _{oct} (3C08 _{hex})

Table 2 -- Parameter Read Full Addresses

	Octal Address	Conversion Formula	Value as seen with a serial analyzer
Logic Command/Status	34700 _{oct}	2 * 34700 _{oct} =	71600 _{oct} (7380 _{hex})
Reference/Feedback	34701 _{oct}	2 * 34701 _{oct} =	71602 _{oct} (7382 _{hex})
Datalink A1	34702 _{oct}	2 * 34702 _{oct} =	71604 _{oct} (7384 _{hex})
Datalink A2	34703 _{oct}	2 * 34703 _{oct} =	71606 _{oct} (7386 _{hex})
Datalink B1	34704 _{oct}	2 * 34704 _{oct} =	71610 _{oct} (7388 _{hex})
Datalink B2	34705 _{oct}	2 * 34705 _{oct} =	71612 _{oct} (738A _{hex})
Datalink C1	34706 _{oct}	2 * 34706 _{oct} =	71614 _{oct} (738C _{hex})
Datalink C2	34707 _{oct}	2 * 34707 _{oct} =	71616 _{oct} (738E _{hex})
Datalink D1	34710 _{oct}	2 * 34710 _{oct} =	71620 _{oct} (7390 _{hex})
Datalink D2	34711 _{oct}	2 * 34711 _{oct} =	71622 _{oct} (7392 _{hex})

Table 3 -- Control and Datalink Addresses



SYSTEM ADDRESSES

- Word Range Write (CMD = 0Fhex, FNC = 00hex)
- Word Range Read (CMD = 0Fhex, FNC = 01hex)
- Typed Write (CMD = 0Fhex, FNC = 67hex)
- Typed Read (CMD = 0Fhex, FNC = 68hex)

System addresses are variable length addresses with the first byte of the address coming immediately after the FNC byte (function code). The FNC byte is always the first byte in the data section. The second data byte is the beginning of the address.

The first part of a system address always follows the structure shown in Table 4. The Address Mask Byte is where each type of system address begins to differ. Table 5 shows how to decode the Address Mask Byte.

00	FNC	Function
00	OFF	Offset
00	OFF	(Always zero)
01	TRANS	Transaction Size
00	TRANS	in words
	MASK	Address Mask Byte

Table 4 -- Data Section from FNC to MASK

MASK Value	System Address Type
00	Symbolic ASCII
00	Logical ASCII (subset of Symbolic)
01	PLC-2 System
xx	Logical Binary

Table 5 -- Address Type Decoding



SYMBOLIC ASCII ADDRESSES

A Symbolic ASCII address has an Address Mask Byte of 00_{hex}. The next byte can be any character except '\$' (24_{hex}).

Symbolic ASCII addressing is used mainly by PLC-3 devices and is not supported by the 1203-Gx2 (except for the Logical ASCII subset explained below).

LOGICAL ASCII ADDRESSES

A Logical ASCII address has an Address Mask Byte of 00_{hex}. The next byte must be '\$' (24_{hex}).

Logical ASCII addressing can be regarded as a subset of Symbolic ASCII addressing and is supported by the 1203-Gx2. A Logical ASCII address would be transmitted as shown in Table 6.

24	\$	This character indicates a Logical ASCII address.
4E	N	Integer File Type
31	1	File Number
30	0	File Number
3A	:	Colon separates file number and element number
31	1	Element number
00	NULL	

Table 6 -- Logical ASCII Address

The address shown in Table 6 is accessing N10:1 (parameter 1's value) in the Gx2. The Gx2 supports up to 3 bytes of file number characters and up to 3 bytes of element number characters.

PLC-2 SYSTEM ADDRESSES

A PLC-2 System address has an Address Mask Byte of 01_{hex}. The next two bytes are used the same as the two byte PLC-2 addresses explained previously.

LOGICAL BINARY ADDRESS

Any Address Mask Byte value other than 00_{hex} or 01_{hex} indicates a Logical Binary address. This type of addressing is the most complex and is not recommended for use with PC software. This addressing mode is supported by the 1203-Gx2 because it is used by PLC-5's.

For information on Logical Binary addresses refer to Publication 1770-6.5.16.