Appendix I   FB-DAP Simple HMI

1.0   General Information

In addition to timer, counter, register, and contact data access function, multiple data access panels of FB-DAP can be connected for multi-drops application of alarm message display, user-defined buttons, wireless card reading and used as the simple human-machine interface (HMI) devices.

■ FB-DAP Simple HMI

Model / Spec.	FB-DAP-A(R)	FB-DAP-B(R)
Display	LCD (Character mode), 2-line×16-character, LED backlight	
Button	20-key (4×5)	
Wireless Card reading	−AR and−BR only，distance 12～18cm	
Power supply	5V	24V
Current consumption	100mA (120mA)	41mA (48mA)
Communication Interface	HCMOS	RS-485
Number of linked DAP	1	Max. 16
PLC Com. Port connected	port 0	port 0,1,2 (In which port 0 and 1 needed to be converted as RS-485)
General features	Status access of Timer/counter, register and contact (write protect control for each data type)	
Special features	Alarm, message display, user-defined of special quick keys	
Card writing feature	Order for machine with special numbers from Fatek is required	

※ MA, MU type PLC can connect to FB-DAP-B(R) through the usage of FB-485P0 converter.
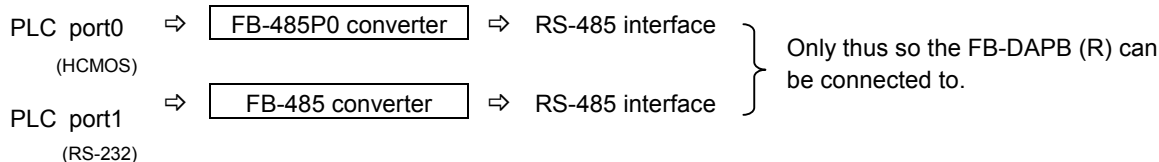
■ Wireless sensing card

Model / Spec.	CARD-1	CARD-2
Memory	64bits with Cyclic Redundancy Check (CRC) on data	
Operation temp.	−25°C～50°C (conforming to ISO7810)	
Power supply	Battery not required (power supplied from wireless electric waves released by an −AR/−BR card-reading module)	
Sensing distance	12cm～18cm(from FB-DAP front)	
Number of writing	Read only(uncopiable, exclusively)	More than 10000 times
Size (mm)	86×54×13	
Weight (Gram)	12	

1.1 Dimensions
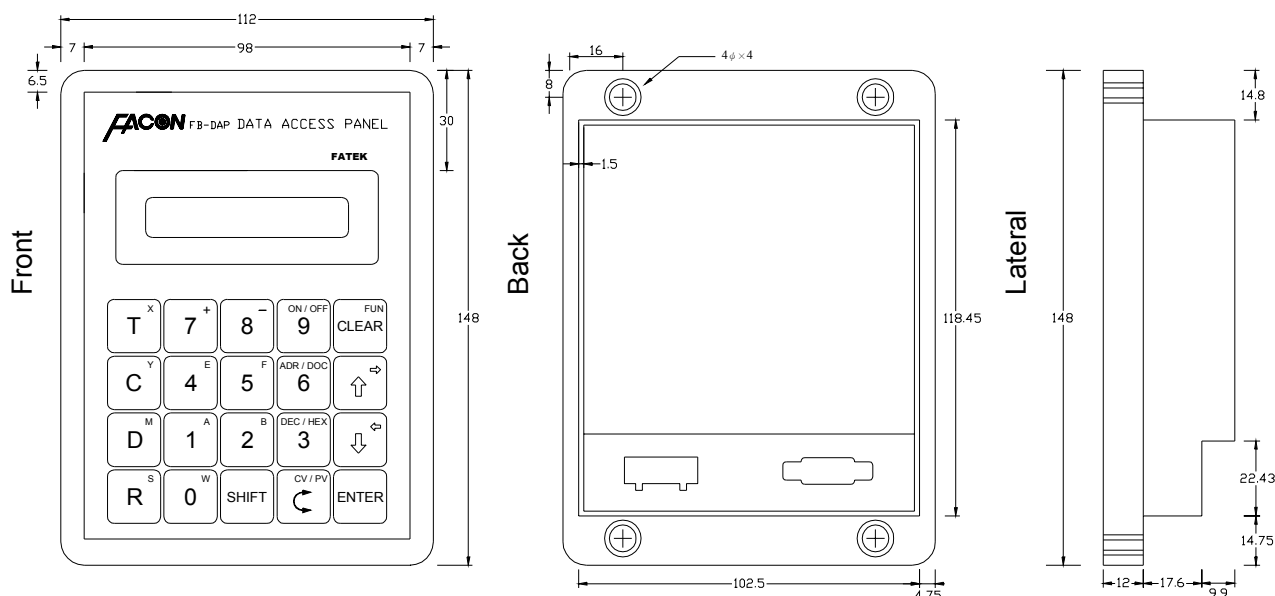
1.2 Important things before operation

1. FB-DAP will return to the operation mode (general data setter and user-defined 8/16 quick keys) after power off and for the DAPs that are connected together can work at different modes.

2. When works with FB-DAP, D2944~D3071 register of PLC will be reserved for DAP application (in which data set by all the FUN functions can be stored except item 11) , the user shall avoid to use these registers.

3. Any communication port of FB PLC, once converted to a RS-485 interface (port 2 is itself a RS-485 interface), can connect up to a maximum of 16 FB-DAP-B(R)s.

   PLC port0 ⇨ | FB-485P0 converter | ⇨ RS-485 interface ⎫
   (HCMOS)   ⎬ Only thus so the FB-DAPB (R) can be connected to.
   PLC port1 ⇨ | FB-485 converter | ⇨ RS-485 interface   ⎭
   (RS-232)

4. When PLC works with FB-DAP-B(R)，the station number of PLC is limited to a range of 1~32.

5. The allowable baud rate for PLC and FB-DAP-B(R) connection (DAP can automatically detect) are as follows

   port0, 1, 2：9600 / 19200 / 38400、Even、7Data bits、1Stop bit
      ex：R4158=5521H, i.e. port2 being 9600；R4158=5523H, i.e. port2 being 38400.

6. When many sets of DAP are connected, if any two or more have the same station number, then DAP will request for number change, which can be done by only entering "[C] + [D] + [new DAP] + [ENTER]" key sequence.

7. The communication line of the RS-485 interface must use a twisted pair with a shielded cover on the outer layer. Please refer to chapter 12-5 in the Operation Manual II for other important points.

8. The scan time of PLC will affect the update time of DAP.

9. The OS version of FB-DAPB(R) shall come after V2.00 so that multi-drop can be connected. Press [SHIFT] + [CLEAR] + [↓] to show the OS version.

10. When WinProladder(or FP07) and DAP are connected to the same PLC, to change the program through WinProladder is not allowed, if so, the timer value displayed by DAP won't be correct (In this case, the DAP shall be reset).

11. OS versions after the V3.15 (including) of FP-07 can enter the document for contacts, registers with 16 characters at most.

1.3　The Main Functions of FB-DAP

　　　　The main functions of FB-DAP can be categorized as： data setting of counter, timer and register , parameter setting of FUN functions, wireless card reading, and message display function. The details of the functions will be introduced in the following sections.
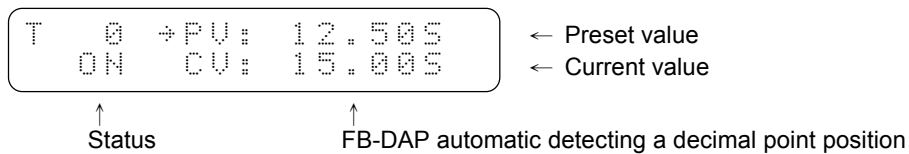
1.4　Setting of General Data

　　　　FB-DAP can be used as a 〝TC setter〞 as well as the access to registers (R,D,W) and contacts (X,Y,M,S). In the FUN functions in the following sections, it can also be used as write-protect with T,C,R,D,X,Y,M,S. There are two measures to monitor data: ADR (general addresses) and DOC monitoring. The latter shall make DOC (16 characters in alphanumeric and symbols) in advance through WinProladder or FP07 for T, C, register R/D and contacts so the DOC can be displayed.

　　　1. ADR Monitoring

　　　　A. Timer and Counter Monitoring

　　　　【Pressing Keys】： $\boxed{T^x}$ or $\boxed{C^y}$ + $\boxed{number}$ + $\boxed{ENTER}$

T or C number　　Cursor position

```
T   0 →PV:  12.50S     ← Preset value
   ON   CV:  15.00S     ← Current value
```

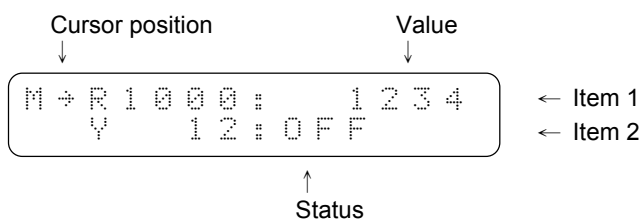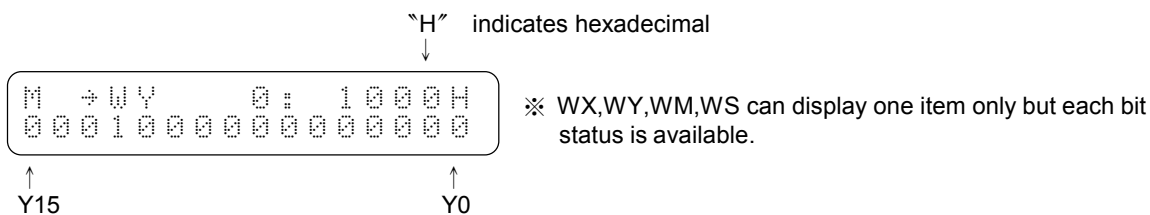　　　　　　Status　　　　　　FB-DAP automatic detecting a decimal point position

　　　　B. Registers (R,D,DR,DD,WX,WY,WM,WS) and contacts (X,Y,M,S) monitoring

　　　　【Monitored range】

Type	T	C	D	R	DD	DR	WX	WY	WM	WS	X	Y	M	S
Range	0 | 255	0 | 255	0 | 2943	0 | 8071	0 | 2492	0 | 8070	0 | 240	0 | 240	0 | 1984	0 | 984	0 | 255	0 | 255	0 | 2001	0 | 999

　　　　【Pressing keys】： $\boxed{R^s}$ or $\boxed{D^w}$

　　　　　　　　　　$\boxed{D^w}$ +（ $\boxed{R^s}$ or $\boxed{D^w}$ ）

　　　　　　　　　　$\boxed{SHIFT}$ $\boxed{0^w}$ + $\boxed{SHIFT}$ （ $\boxed{T^x}$ or $\boxed{C^y}$ or $\boxed{D^w}$ or $\boxed{R^s}$ ）

　　　　　　　　　　$\boxed{SHIFT}$ （ $\boxed{T^x}$ or $\boxed{C^y}$ or $\boxed{D^w}$ or $\boxed{R^s}$ ）

$\boxed{number}$ + $\boxed{ENTER}$

　　Cursor position　　　　　　Value

```
M→R1000:    1234     ← Item 1
    Y   12:OFF          ← Item 2
```

　　　　　　　　Status

"H" indicates hexadecimal
↓

```
M  →WY    0:  1000H
0001000000000000
```
↑   ↑
Y15   Y0

※ WX,WY,WM,WS can display one item only but each bit status is available.

Note：1、Pressing [CV/PV] can move the cursor up and down or switch between CV or PV.

2、Pressing [⇧] or [⇩] can decrease or increase the monitored item number.

3、For a monitored item value, input a new value directly and then press [ENTER]. The status of the contacts can be changed by pressing [SHIFT] + [ON/OFF 9].

4、Pressing [SHIFT] + [DEC/HEX 3] can change the format of display value (either with decimal or hexadecimal).

2.DOC monitoring

```
    TIMER  10
ON   CV:  123.4S
```
← Document of T10
← Current value

↑
Contact status

```
   PRODUCT  1
   =   1000
```
← Register document
← Value
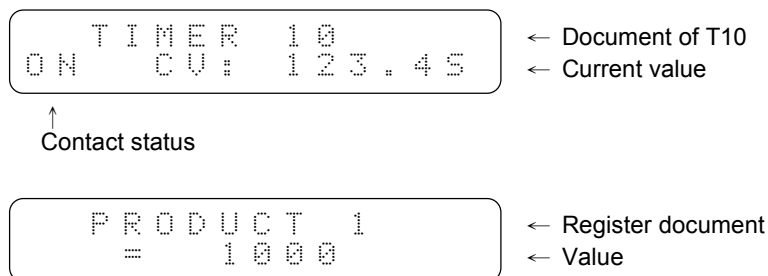
Note：1.Pressing [SHIFT] + [ADR/DOC 6] can switch the monitoring of ADR and DOC.

2.To switch the display between CV (current value) and PV of the timer (counter) can use [CV/PV].

3.[⇧] or [⇩] can be moved up or down to next monitored item with DOC.

3. Quick monitoring FUN keys(FUN KEY 0～9, totaling 10 keys)

【Pressing keys】： [SHIFT] + [FUN CLEAR] ([0] ～ [ON/OFF 9]) ⇨ Direct display of a monitored item set by the user.

Note：1.Items to be monitored can be set from the following "FUN functions".

2.Items to be monitored can be displayed with ADR or DOC.

1.5　FUN Functions

1.5.1　Enter and Exit of FUN functions

■ Enter FUN functions

Press ⎡SHIFT⎤ + ⎡ENTER⎤ + ⎡FUN/CLEAR⎤ ⇨

Press ⎡↑⎤ ⎡↓⎤

⎡ENTER⎤

1、PASSWORD OPEN	(Password open)
2、PASSWORD CLOSE	(Password blocked)
3、PASSWORD SET	(Password setting)
4、DEFINE FUN KEY	(Self-define speed monitoring function key FUN KEY 0-9)
5、DEFINE ALARM ADDRESS	(Self-define start address of content for display at an alarm)
6、DEFINE SOFTKEY (8-KEY)	(Self-define 8 special keys)
＊ 7、DEFINE SOFTKEY MODE (8-KEY)	(Enter into the modes of the 8 special keys)
8、DEFINE SOFTKEY (16-KEY)	(Self-define 16 special keys)
＊ 9、ENTER SOFTKEY MODE(16-KEY)	(Enter into the modes of the 16 special keys)
○ 10、VOLUME	(Adjust volume)
11、SET DAP NO.	(Set DAP number(s) at multi-link)
○ 12、MAX. DAP NO. ON NETWORK(1~16)	(Set the max. DAP numbers on network (1-16) at multi-link)
○ 13、WRITE PROTECT	(Data write-in protection)
○ 14、RF CARD MODE	(RF card mode selection)
○ 15、RF CARD START ADDR.	(Start address of a RF card number storage)
＊ 16、ENABLE KEYS MAPPING	(Corresponding special contacts of ENABLE keys)

＊：Indicates when multiple DAPs are connected, each DAP can be set respectively.

○：Indicates when multiple DAPs are connected, the information set by one of them is not available for use until PLC is reset.

■ Exit of FUN functions to general information setter functions.　Press ⎡SHIFT⎤ + ⎡FUN/CLEAR⎤ + ⎡Monitored items⎤ + ⎡ENTER⎤

Note：1、When several DAPs are connected, all FUN (except item 11)can be executed only by one DAP which will store the configuration to PLC (D2944～D3071).

2、After entering FUN 4~15, without password protection, all the FUN functions can be executed by only pressing ⎡ENTER⎤ . While password protection, it is required to pass it first before executing FUN functions.
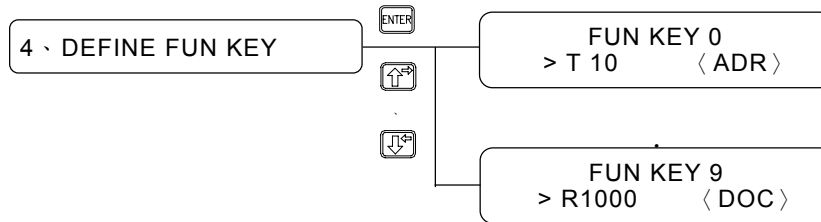
3、If there has a password setting in DAP, FB-DAP will be in a password protection mode after each power up.

4、FUN items 1~9 can be entered with numeric keys directly and then go straight to that function.

5、After executing a item of FUN functions, if execution of other items is required, press the three keys ⎡SHIFT⎤ + ⎡FUN/CLEAR⎤ + ⎡ENTER⎤ again.

● FUN 1~3（password）

1、 Password can up to 4 digits（unrelated to LADDER program's password）.

2、 After the password is set, it will enter a password-locked state after power up.

3、 After the password is locked, all the FUN functions are not available.

● FUN 4（DEFINE FUN KEY）：user-defined quick monitoring function keys


```
4、DEFINE FUN KEY     [ENTER]          FUN KEY 0
                      [↑]            > T 10      〈ADR〉
                      [↓]
                                       FUN KEY 9
                                     > R1000     〈DOC〉
```

1、 There are ten user-defined quick monitoring function keys in total.

2、 All items available for monitoring can be defined with the ten function keys.

3、 Pressing [SHIFT] + [ADR/DOC 6] can switch between ADR and DOC.

● FUN 5（DEFINE ALARM ADDRESS）：Define the address for display when an alarm occur.

1. There are ten start addresses, that is, ten levels of alarm signals.

2. All items available for monitoring can be defined in the said ten start addresses.

3. Pressing [SHIFT] + [ADR/DOC 6] can switch between ADR or DOC display.

4. Control method of alarm message display are shown as follows：

【Corresponding list for control】

Alarm level （priority sequence）	Control contact	Index register	Base address of the content displayed
ALARM 0	M1900	R3820	user-defined
ALARM 1	M1901	R3821	user -defined
⋮	⋮	⋮	⋮
ALARM 9	M1909	R3829	user -defined

【Example】Assume the start address of ALARM 0 displayed content is R100,

If M1900=1 then the alarm address for display is R100 +（R3820）

If R3820=0   ⇨   Display address or DOC of R100

R3820=1   ⇨   Display address or DOC of R101

R3820=2   ⇨   Display address or DOC of R102

Note 1：When more than one alarm occurs at same time, only the address or DOC with higher priority can be displayed. The lower priority alarm will not be displayed until the higher priority alarm is disappeared.

Note 2：To display a DOC (message) more than 16 characters, can change the index registers (R3820～R3829) to achieve this.

Note 3：M1911 can control whether to activate the alarm buzzer. If M1911=0 (default), it will be activated.

- FUN 6（DEFINE SOFTKEY－8 KEYS）：user-defined 8 soft keys
  FUN 7（ENTER SOFTKEY MODE－8 KEYS）：Enter 8 soft key mode

  1. User can define 8 soft keys：$\boxed{T^x}$ 、 $\boxed{C^y}$ 、 $\boxed{D^M}$ 、 $\boxed{R^s}$ 、 $\boxed{\text{SHIFT}}$ 、 $\boxed{\overset{\text{CV/PV}}{\circlearrowleft}}$ 、 $\boxed{\Uparrow}$ 、 $\boxed{\Downarrow}$

  2. Definable range：R0～R3839、D0～D2943、M0～M1899.

  3. In defining M0～M1899, this key can be defined as one of the 5 modes.

Mode	Definition		Description
0	Set	（S）	Set this contact to 1
1	Reset	（R）	Set this contact to 0
2	Moment	（M）	1 in pressing, 0 is released
3	Inverse	（I）	Pressing once will inverse the state.
4	Monitor	（V）	Monitor this contact

     【Example】 Assume $\boxed{T^x}$ definition as R0, $\boxed{C^y}$ definition as M0 mode 0(Set). Once enter the 8 soft key mode in function 7,

     Then pressing $\boxed{T^x}$ ⇨ display address or DOC of R0.

     $\boxed{C^y}$ ⇨ display   address or DOC of M0 and force M0 ON

     Note 1：After defining the 8 soft keys, once function 7 is executed, it will enter 8 soft key operation mode. And then the 8 soft keys will be executed according to function 6 definitions.
     Note 2：$\boxed{\Uparrow}$ 、 $\boxed{\Downarrow}$ both can not be defined, but the other keys will be unaffected if not define.
     Note 3：To return to normal operation mode, press 〝 $\boxed{\overset{\text{FUN}}{\text{CLEAR}}}$ + （D2972 content） + $\boxed{\text{ENTER}}$ 〞, among which D2972 content is from 0000～9999（4 digits required）.

- FUN 8（DEFINE SOFTKEY－16 KEYS）：user-defined 16 soft keys
  FUN 9（ENTER SOFTKEY MODE－16 KEYS）：Enter 16 soft key mode

  1. Available for defining 16 soft keys：$\boxed{T^x}$ 、 $\boxed{C^y}$ 、 $\boxed{D^M}$ 、 $\boxed{R^s}$ 、 $\boxed{\text{SHIFT}}$ 、 $\boxed{\overset{\text{CV/PV}}{\circlearrowleft}}$ 、 $\boxed{0}$ ～ $\boxed{9}$

  2. Definable range：T0～T255、C0～C199、R0～R3839、D0～D2943、M0～M1899。

  3. In defining M0～M1899, this key can be defined as one of the 5 modes and when a message is being displayed, if the key is pressed, the display will not be changed.

Mode	Definition		Description
0	Set	（S）	Set this contact to 1
1	Reset	（R）	Set this contact to 0
2	Moment	（M）	1 in pressing, 0 in being released
3	Inverse	（I）	Pressing once will have one inverse phase.
4	Monitor	（V）	Monitor this contact

  4. When defined as T, C, R or D, the value change is by pressing $\boxed{\Uparrow}$ or $\boxed{\Downarrow}$ to make the corresponding M1840～M1871 ON (the user is required to write a plus/minus 1 program in the LADDER program) to achieve this purpose.

Soft key	0	1	2	3	4	5	6	7	8	9	T	C	D	R	SHIFT	$\circlearrowleft$
⇑	M1840	M1841	M1842	M1843	M1844	M1845	M1846	M1847	M1848	M1849	M1850	M1851	M1852	M1853	M1854	M1855
⇓	M1856	M1857	M1858	M1859	M1860	M1861	M1862	M1863	M1864	M1865	M1866	M1867	M1868	M1869	M1870	M1871

     【Example】Assume $\boxed{T^x}$ defined as R0, $\boxed{C^y}$ defined as M0 mode 1 (Reset).

After entering 16 soft key mode in function 9,

Press ⬚T·x ⇨ Display the address or DOC of R0, and then pressing ⬚⬆, then corresponding M1850 will be ON; OFF after it is released.

⬚C· ⇨ Display the address or DOC of M0 and force M0 OFF.

Note 1：After the 16 soft keys are defined, once function 9 is executed, it will enter 16 soft key operation mode and then the 16 soft keys will be executed according to function 8 definition.

Note 2：to return to normal operation mode, press "⬚FUN/CLEAR + (⬚⬇ + ⬚⬆ + ⬚⬇ + ⬚⬆) + ⬚ENTER "。

● FUN 11（SET DAP NO.）：When DAP are connected as multi-drop, set DAP number.

Any communication port of FB-PLC after converted to RS-485 interface (Among which port2 as such is a RS-485 interface) can connect up to 16 FB-DAP-B(R)s. Each DAP shall need a unique number, 1~16 (but one of them must be number 1). This DAP number has nothing to do with PLC numbers, meaning the number can be same with PLC number.

● FUN 12（MAX. DAP NO. ON NETWORK）：when several DAPs are connected, set the biggest DAP number of the connected network.（Max. 16 DAPs, default 7）

In a connection of several DAPs, the new DAPs can be joined dynamically. The bigger the Max. DAP number, the longer the time to refresh the data of each DAP. As a result, set the Max. DAP number (the DAP number can not be bigger than this number) on the network appropriately will decrease time for data to update.

● FUN 13（WRITE PROTECT）：Define the write protection control on different data type.

Aimed for monitored items (T, C, R, D, Y, M, S), set the information in write protection individually. Just fill in 1 at the corresponding place, and then the data type is write protected and is read only.

● FUN 14（RF CARD MODE）：Wireless card reading mode

MODE= "0" ⇨ When reading a RF card, it will display whether this card is OK or Error. When the RF card is out of sensing distance, it will pop up "NEXT", indicating another RF card is available now.

MODE= "1" ⇨ once a RF card is read, it will beep once and will not display any information so the sensing speed can be faster. When many DAPs are connected, this mode will increase by about 60mS to each DAP for monitored item information.

● FUN 15（RF CARD START ADDR.）：Start addresses storing the wireless RF card numbers

With this function can define the address for Storing a card number, the address can range from D0~D2860 (default to D2860). Please refer to the Wireless Card Reading Functions in 1.6 for detailed description.

● FUN 16（ENABLE KEYS MAPPING）：Enable the operation of key mapping

After this function is set to "Enable" and enter SOFTKEY MODE（8KEYS and 16KEYS）, pressing a user-defined soft key will force ON one contact which corresponding to the depressed key and the other contacts will become OFF. When set to "Disable", the corresponding special contact of this DAP will not be effected.

The following table is the special contacts of soft-keys of 16 KEYS MODE for different DAP number:

No. \ KEY	T	C	D	R	7 (↑)	4 (↓)	1	0	8	5	2	SHIFT	9	6	3	↺
1	M1784	M1785	M1786	M1787	M1788	M1789	M1790	M1791	M1792	M1793	M1794	M1795	M1796	M1797	M1798	M1799
2	M1768	M1769	M1770	M1771	M1772	M1773	M1774	M1775	M1776	M1777	M1778	M1779	M1780	M1781	M1782	M1783
3	M1752	M1753	M1754	M1755	M1756	M1757	M1758	M1759	M1760	M1761	M1762	M1763	M1764	M1765	M1766	M1767
4	M1736	M1737	M1738	M1739	M1740	M1741	M1742	M1743	M1744	M1745	M1746	M1747	M1748	M1749	M1750	M1751
5	M1720	M1721	M1722	M1723	M1724	M1725	M1726	M1727	M1728	M1729	M1730	M1731	M1732	M1733	M1734	M1735
6	M1704	M1705	M1706	M1707	M1708	M1709	M1710	M1711	M1712	M1713	M1714	M1715	M1716	M1717	M1718	M1719
7	M1688	M1689	M1690	M1691	M1692	M1693	M1694	M1695	M1696	M1697	M1698	M1699	M1700	M1701	M1702	M1703
8	M1672	M1673	M1674	M1675	M1676	M1677	M1678	M1679	M1680	M1681	M1682	M1683	M1684	M1685	M1686	M1687
9	M1656	M1657	M1658	M1659	M1660	M1661	M1662	M1663	M1664	M1665	M1666	M1667	M1668	M1669	M1670	M1671
10	M1640	M1641	M1642	M1643	M1644	M1645	M1646	M1647	M1648	M1649	M1650	M1651	M1652	M1653	M1654	M1655
11	M1624	M1625	M1626	M1627	M1628	M1629	M1630	M1631	M1632	M1633	M1634	M1635	M1636	M1637	M1638	M1639
12	M1608	M1609	M1610	M1611	M1612	M1613	M1614	M1615	M1616	M1617	M1618	M1619	M1620	M1621	M1622	M1623
13	M1592	M1593	M1594	M1595	M1596	M1597	M1598	M1599	M1600	M1601	M1602	M1603	M1604	M1605	M1606	M1607
14	M1576	M1577	M1578	M1579	M1580	M1581	M1582	M1583	M1584	M1585	M1586	M1587	M1588	M1589	M1590	M1591
15	M1560	M1561	M1562	M1563	M1564	M1565	M1566	M1567	M1568	M1569	M1570	M1571	M1572	M1573	M1574	M1575
16	M1544	M1545	M1546	M1547	M1548	M1549	M1550	M1551	M1552	M1553	M1554	M1555	M1556	M1557	M1558	M1559

In 8KEYS MODE, only 8 keys [T×]、[Cʸ]、[Dᴹ]、[Rˢ]、[SHIFT]、[↺]、[⇧]、[⇩] are effective, i.e. number keys ineffective. The [⇧]、[⇩] take the positions of [7] and [4], but it must be defined as soft keys before the corresponding special contacts are effective.

〈Example〉 DAP No.2：Pressing [T×], M1768 is ON and M1769～M1783 OFF.

DAP No. 5：Pressing [Dᴹ], M1722 is ON and other contacts M1720～M1735 OFF.

1.6 Wireless card reading functions

● An applicable RF card is an read-only card (RF-CARD-1) or readable/writable card（RF-CARD-2）. The card number of the read-only card is unique (with 16 0~F digits) and not copyable. And card numbers read by FB-DAP-AR(BR) will be encoded further thus the security is high.

● The sensing distance of a RF card generally is 12～18cm, but shall be kept away from electromagnetic wave interference source or high voltage power line.

● Readable/Writable cards （RF-CARD-2）can use Fatek's FB-DAP-W(with unique machine number) to write in the card number. The card number is encoded and relate with the machine number of the FB-DAP-W (the first 4 codes are the machine's number, the last 12 codes defined by the user). Only through Fatek's FB-DAP-A(B)R can a correct numbers be read. There are two ways to write the card number into Readable/Writable cards （RF-CARD-2）.

1. Use FUN function 17 of FB-DAP-W to input the 12 digits card number with 0~F digits or use [⇧]、[⇩] key and put the RF-CARD-2 in front of FB-DAP-W within 12cm and then press [ENTER], so that the card number can be written into RF-CARD-2.

2. When CARD-2 within the sensing range of FB-DAP-A(B)W, the FB-DAP-A(B)W will put the sensed card number into register area for corresponding DAP station (please refer next section) after that it will check if the M1899 is on , if yes it will delay 150mS then read back the last three registers of the PLC area that was held the sensed card number for corresponding DAP station (for example, the 3 registers to hold the written card number is D2862~D2864 for DAP station #1) and write it into the CARD-2 and shown "OK" on LCD display.

When application, the ladder should first set the M1899 'on' then wait for the card-detecting signal occurred. Upon detecting the card approaching, the ladder should put the new card number that can be based on the sensed card number of this time or pre-determinate number into the 3 registers before the 150mS time limit is expired.

● The sensing card number storage locations and its application

FB-DAP puts the RF card numbers within sensing distance into two places in PLC. The places and application are described as follows:

1. Fixed in R3835~R3839（totaling 5 registers）：During operation, shall control the M1910 .

Card number format

R3835	N1	N2
R3836	× × × ×	
R3837	× × × ×	
R3838	× × × ×	
R3839	× × × ×	

N1：DAP number 1~16（i.e. 1H~10H）

N2：52H（R：read-only card） or 57H（W：readable/writable card）

R3836~R3839 store 16 0~F card numbers

Application：
Only in monitoring (or8/16 soft keys) mode (non-FUN functions) and the RF card is within sensing distance, FB-DAP（−AR or −BR）will send the RF card number together with DAP number to PLC R3835~R3839. In mode 0 of function 14 （RF CARD MODE）, all the user needs to do is compare the card number. If it is OK, then set M1910 to 1 and DAP will indicate "OK", or "ERROR" if M1910 is set to 0. When the RF card is out of sensing distance, DAP will show "NEXT" momentary and clear the content of PLC R3838~R3839 to 0, which means available for another RF card sensing. In mode 1 of function 14, as soon as DAP reads a card number, it will save it to R3835~R3839 with a beep. After the RF card exits, the 5 registers remain unchanged.

Applicable occasions：
Where one DAP or multiple DAPs are connected but RF cards are not used frequently, the program to be applied will be a lot easier. But in the event of a card number read from different DAPs at the same time, it will be difficult for PLC to identify the information correctly.

2. Default D2860～D2939 (16 different DAP take on 5 registers individually, i.e. 80 registers in all, but the locations can be changed through function 15) control one point of M1880～M1895 individually when in use.

Card number format		
D2860	N1	N2
D2861	× × × ×	
D2862	× × × ×	
D2863	× × × ×	
D2864	× × × ×	

No. 1
⇓
M1880

Card number format		
D2865	N1	N2
D2866	× × × ×	
D2867	× × × ×	
D2868	× × × ×	
D2869	× × × ×	

No. 2
⇓
M1881

Card number format		
D2870	N1	N2
D2871	× × × ×	
D2872	× × × ×	
D2873	× × × ×	
D3974	× × × ×	

No. 3
⇓
M1882

....

Card number format		
D2935	N1	N2
D2936	× × × ×	
D2937	× × × ×	
D2938	× × × ×	
D2939	× × × ×	

No. 16
⇓
M1895
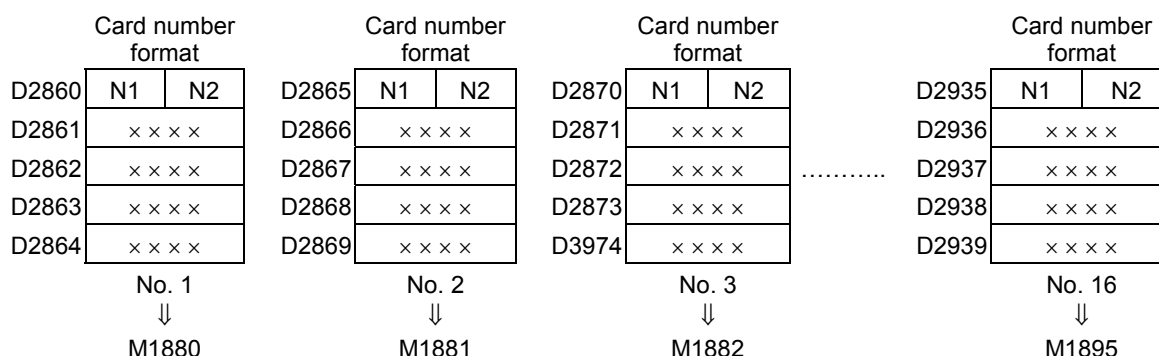
Application method：

The application method is the same as described above-mentioned but that the storage places of card numbers and corresponding contacts for control are different. For example, in mode 0 of function 14, from No. 2 DAP sensing to the RF card, now no. 2 will send same card numbers to two different places in R3835～R3839 and D2865～D2869 (the content of the other registers remains unchanged), and all the user needs to do is control M1881 for the DAP to display "OK" or "ERROR". After the RF card exits, the content of the 10 registers R3835～R3839 and D2865～D2869 will be cleared to 0 (but remains unchanged in mode 1).

Applicable occasions：

When several DAPs are connected, the RF card can be read in from different DAPs and each DAP has its own card numbers storage places and control points so that no PLC misjudgment case occurs, but the programming will be more difficult.

※ If you do not want the card number storing in R3835～R3839 to reveal by other people, can use the Ladder program to fill in these registers with other fixed values immediately after the card number were checked.

1.7　Special message display function

In general data monitoring mode and soft key mode (16 KEYS or 8 KEYS), the user can configure the DAP to display the messages for different circumstances, and the two-line display on the LCD can be controlled individually to display different messages. Every message length can range from 1~511 characters, in which a maximum of 16 variables (if variables with 32-bit are not used, then it can use up to 25) can be included. When a message has more than 16 characters, the message will be scrolled left for display, in which the moving speed or pause time can be configured flexibly.

1.7.1　Message display application

The FB-DAPB(R) can be connected up to 16 sets (Number 1~16). Each DAP not only can display messages independently but also can display the same message simultaneously. If the certain special contact (R3780~M3813) is set, the DAP will display the ASCII message pointed by the corresponding pointer register （R3780～M3813）. The content of the pointer register is the start register of messages, i.e. start of ASCII message. The pointer register content can be changed dynamically in order to display the different messages.

The following is a list of special contacts and pointer registers for each DAP to control the display of messages.

Number of a message displayed	LCD line 1		LCD line 2	
	Special contact	Pointer register	Special contact	Pointer register
1～16	M1800	R3780	M1801	R3781
1	M1802	R3782	M1803	R3783
2	M1804	R3784	M1805	R3785
3	M1806	R3786	M1807	R3787
4	M1808	R3788	M1809	R3789
5	M1810	R3790	M1811	R3791
6	M1812	R3792	M1813	R3793
7	M1814	R3794	M1815	R3795
8	M1816	R3796	M1817	R3797
9	M1818	R3798	M1819	R3799
10	M1820	R3800	M1821	R3801
11	M1822	R3802	M1823	R3803
12	M1824	R3804	M1825	R3805
13	M1826	R3806	M1827	R3807
14	M1828	R3808	M1829	R3809
15	M1830	R3810	M1831	R3811
16	M1832	R3812	M1833	R3813

※ The start register of a message indicated by an pointer register means：
　0～8070：indicating R0～R8070
　10000～13070：indicating D0～D3070

※ Special contacts M1800 and M1801 have a priority display function.

※ M1911 can control an alarm buzzer whether to sound or not. If M1911=0 （preset）, it shall be activated.

〈Example〉Assume M1803 from 0→1, R3783=100
　　　　　Result：Line 2 of No. 1 of the LCD will display messages in ASCII Code starting by R100.

〈Example〉Assume M1828 from 0→1, R3808=10000
　　　　　Result：Line 1 of No. 14 of the LCD will display messages in ASCII Code starting by D0.

〈Example〉Assume M1801 from 0→1, R3781=0
　　　　　Result：Line 2 of all the DAPs will display messages in ASCII Code starting by R0.

1.7.2 The formats of messages（ASCII Table）

The formats of messages are very similar to the ASCII file in chapter 15 of the Advanced Manual that are all categorized as fixed background data and dynamic variable data. The former can be alphanumeric characters or symbols, and the later can be a data in binary, decimal or hexadecimal format.

The message length can be in the range 1~511 characters (including spaces), but because there are only 16 characters a line in a DAP LCD, if a message has more than 16 characters, it will be scrolled automatically toward the left (default speed is one character per second); if the message is less than 16 characters, the tail will be filled in with blank and without moving.
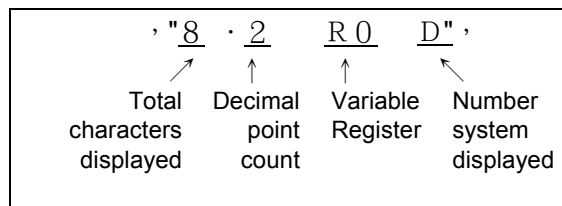
To edit a message, the WinProladder ASCII Editor can be applied. The editing command formats are as follows:

① Background data format

Any ASCII Code quoted with ' ' can be background data. To display a single quotation mark as such, two continuous quotation marks are a must. Example:

' I ' 'M A BOY' will be displayed I'M A BOY

② Variable data format

```
,"8 · 2    R 0    D",
   ↗    ↑      ↑       ↖
  Total  Decimal  Variable  Number
characters  point   Register  system
displayed   count            displayed
```

The formatted message in a pair of dual quotation marks 〝 〞 is used to indicate the register address (number) storing the variable data and in what format and number system to display.

- Total characters displayed：In this case, the value (including the minus sign) of the variable R0 is displayed with 8 characters. If the variable value needs more space than this field to display, the higher digits will be truncated. On the contrary will be padded with blanks.

- Decimal point count：the decimal point count in the total digits. In this case, with a total count of 8 digits, the decimal point count is 2. The decimal point sign 〝·〞 as such possesses one digit and there are 5 digits left in the integral part.

- Variable register：can be used as 16 bit register's R、D、WX、WY、………, or 32 bit register's DR、DD、DWX、DWY、………etc. The content value in the register will be retrieved and displayed with the format and number system described in the 〝 〞.

- Contacts：generally displayed as ON or OFF (total characters occupied is fixed to 3), but if affix with letter B it will show 0 or 1 (occupy 1 character space)

- Number system：can be hexadecimal H, decimal D (the number system will use decimal if without indication, so D can be omitted.), or binary B, etc., but a 32 bit variable can not be displayed with binary system.

In this case, R0's content value is －32768. In 8.2 format the result is displayed as:

－	3	2	7	.	6	8	

If the format is changed from 8.2 to 5.1, then the result becomes:

2	7	6	.	8

- | nS | Scroll left speed (repeatable)

  Message scroll left one character every n× 0.1s. n = 1 ~ 255.

- | nP | Stop move (repeatable)

  Message stops scrolling by n × 0.1s then continue to scroll. n = 1~ 255.

- | , | Comma

  Used as a delimiter to separate the adjacent statements of formatted message. Each statement is a complete and executable.
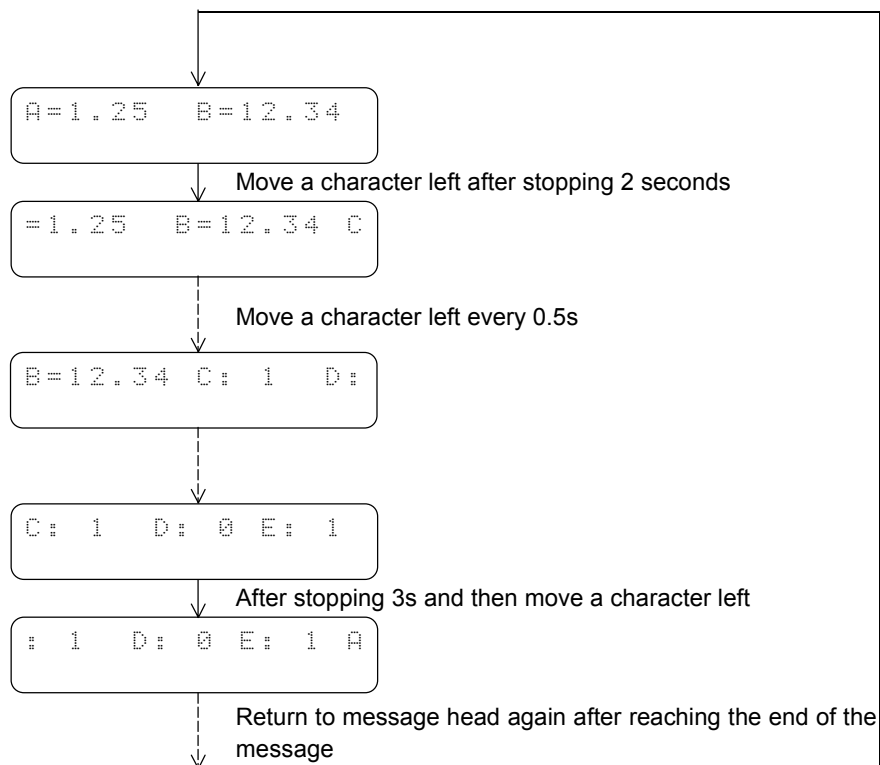
- | END | End of a formatted message

  ※ nS and nP commands will not be activated until after the message preceding them moves to the left first place on the LCD display. It can be repeatedly appeared in any place of formatted message, but the same command cannot be adjacent.

  〈Example〉 Message is edited with WinProladder ASCII file editor. R0 is a starting register of an ASCII file and the formatted message is shown as follows：

  5S，20P，'A='，＂6.2R3840＂，'B='，＂6.2R3841＂，30P，'C：'，＂1M0B＂，
  ' D：'，＂1M1B＂，' E：'，＂1M2B＂，' '，END

If M1800 from 0→1 and R3780=0（i.e. R0）, Line 1 of the LCD of all DAPs is shown as follows：

```
A=1.25  B=12.34
```
Move a character left after stopping 2 seconds
```
=1.25  B=12.34 C
```
Move a character left every 0.5s
```
B=12.34 C: 1  D:
```
```
C: 1  D: 0 E: 1
```
After stopping 3s and then move a character left
```
: 1  D: 0 E: 1 A
```
Return to message head again after reaching the end of the message

Always cycling display

When M1800 And R3780 Are Not changed

  ※ Variable data is renewable anytime.

  ※ To display another message, just change R3780 value and not for M1800.